

List of Glossary Terms

A

Ab initio approach 689
Abduction 201
Abelian group 8028
Abrupt climate change 2
ABS 1565
Absentee owners 2284
Absolute error 5161
Absolute temperature 2859
Absolute time 9831
Absolutely continuous curves 5440
Absorbing state 3360, 8380
Abstract game 1518
Abstract game of network formation with respect to irreflexive dominance 6024
Abstract game of network formation with respect to path dominance 6024
Ac 1307
AC Electroosmosis or induced charge electroosmosis (ICEO) 5573
Acceleration mechanism 21
Accessible bonds or sites 6538
Accessible hull 6521
Accretion disk 381
Accretionary wedge (prism) 10047
Accuracy 271, 1826, 5206
Accuracy (rate) 1982
ACF 4114
Achievable mate 9656
Action angle variables 2261
Action potential 6099
Action profile 8649
Action set 8649
Action type 7651
Action-angle variables 5064

Actions 6709
Activation function 1813
Activator 1352
Active fault 2497
Active gel 1739
Active membranes 5524
Activity, sensitivity 600
Activity-based approach 9536
Actors 5999
Actuator 9749
Actuators 1475
Acute hospitals 4562
Adaptation 113
Adaptive behaviors 8364
Adaptive planning framework 8439
Adaptive system 4869
Adaptive tension 8364
Additive cellular automata 64
Additively separable preferences 9655
Adiabatic approximation 4194
Adiabatic decoupling 6689
Adiabatic perturbation theory 6689
Adiabatic switching 5859
Adjacency matrix 4820, 5266, 8815
Adjacency matrix A 6048
Adjacent 8232, 8346
Adjoint conjugate operator 4317
ADMET 2196
Administrative leadership 8364
Adomian decomposition method 5161
Adomian decomposition method, Homotopy analysis method, Homotopy perturbation method and Variational perturbation method 5144
Adomian method 81
Adomian polynomials 5161

- Adopters 1956
 Adoption 8306
 Adsorption 1307
 Adverse selection (hidden information) 6977
 Affiliation network 8291
 Affine CA 2981
 Affinity 4776
 Age of a cluster or fuzzy rule 3244
 Agency trade 1565
 Agent 131, 148, 184, 5286, 7533, 8364, 8405
 Agent architecture 184
 Agent based models 8306
 Agent (or software agent) 8375
 Agent-based computational economics (ACE) 201
 Agent-based computational models 8265
 Agent-based model 131
 Agent-based modeling 5286
 Agent-based modeling (ABM) 113
 Agent-based models 1041
 Agent-based models (ABM) 201
 Agent-based simulation 92, 160
 Agents 201, 848
 Agglomerative (hierarchical) clustering algorithm 2348
 Aggregate models 5377
 Aggregate (“sufficient unit”) equation modeling 4609
 Aggregation 1982, 8364
 Aggregation mechanisms 8364
 Aggregation operators 224
 Aging 4210, 7520, 7583
 Agmon metric 6747
 Agree-and-pursue algorithm 7713
 Aharonov Bohm effect 8597
 Aharonov–Bohm (AB) effect 7290
 AI 7931
 Air traffic flow 234
 AKNS method 4960
 Alexander–Orbach conjecture 310
 Alfvén speed 8010
 Alfvén wave 8521
 Algebra 8292
 Algebraic models 8265
 Algorithm 7361
 Algorithmic complexity 5206
 Algorithmic complexity of object x 243
 Algorithmic self-assembly of DNA tiles 5631
 Algorithmic trading 9565
 Allele 9106
 Allometric laws 3779
 Allowable set of partners 9654
 Almost conjugacy 8889
 Almost equicontinuous CA 2232, 9246
 Almost every, essentially 3083
 Almost everywhere 4983
 Almost everywhere (abbreviated a. e.) 3040
 Almost everywhere (a.e.) 2883
 Alphabet of a cellular automaton 63
 α -Helix 9750
 α -Level set and support 4047
 Alternating independent-2-paths 8319
 Alternating k-stars 8319
 Alternating k-triangles 8319
 Alternative splicing 4161
 AM1 7931
 Amoeboid motility 1738
 Amorphous computer 257
 Amygdala 1109
 Analog 9127
 Analog circuit 9706
 Analytical method for solving an equation 5091
 Analytical theories of turbulence 3642
 Ancilla qubits 7325
 Andesite 9763
 Anisotropic elements 1719
 Anisotropy 6565
 Annealed law 7520
 Annotations 131
 Anomalous diffusion 310, 3878, 5218
 Anomalous resistivity 8521
 Ant colony optimization 2113, 8869
 Ant colony optimization (ACO) 113
 Anthropogenic climate change 3
 Anthropogenic emissions 1071
 Anthropomorphic 4643
 Antibody 2113, 4776
 Antigen 2113, 4776
 Antigen presenting cells (APC) 4776
 AO 7931
 Aperiodic tile set 9159
 Apparent exponent 6990
 Apparent stress 2581
 Applicability domain 7071

- Approximate controllability 4804
 Approximation 7787
 Approximation space 7787
 Aqueous fluid 2676
 AR 4643
 Arbitrage 3435
 Arbitrage pricing theory (APT) 3475
 Arbo viruses 1095
 Arbo viruses transmitted by Aedes mosquitoes 1095
 Arc 8232
 Archimedean lattices 6579
 ARCH(q) 3456
 AR(k) 3456
 ARMA 4114, 5206
 Arrival time 2449
 Arrow 8346
 Arrow's impossibility theorem 9932
 Arterial 9470
 Artificial chemistry 113
 Artificial financial markets 3374
 Artificial immune systems 2113
 Artificial intelligence (AI) 4869
 Artificial life 8050
 Artificial life (ALife) 113
 Artificial neural network 1813, 3475
 Artificial neural network (ANN) 113
 Artificial neuron 1813, 2139
 Artisan owners 2284
 Ascendancy 2697
 Aseismic 1689
 Ask price 5392
 Aspects 131
 Assignment 9470
 Assortative mixing and disassortative mixing 2531
 Assortativity coefficient 6049
 Astronomical unit (AU) 8521
 Asymmetric information 6977
 Asymptotic density 4497
 Asymptotic negligibility 5360
 Asymptotic series 6748
 Asymptotic shape 4497
 Asynchronous 848
 Asynchronous circuit 5859
 AT property of an automorphism 8555
 Atmosphere 1
- Atmospheric boundary layer 8140
 Atomic force microscope (AFM) 689
 Atomic force microscopy (AFM) 7026
 Atomic units, a. u. 8575
 Atomistic simulation 5746
 ATP 3598, 9749
 Attendance 5588
 Attenuation factor Q^{-1} 7914
 Attenuation relation (ground-motion prediction equation) 4435
 Attraction basin 2232
 Attractor 381, 2232, 2903, 3828, 4723, 8040, 8183, 8420, 8927, 9224, 9246
 Attractors 600
 Attribute 1826, 1983, 7787, 8232
 Attribute (*also feature or variable*) 5317
 Attribute node 1826
 Attributed-based data model (ABDM) 4305
 Attributes 131
 Atypical graph 6013
 Aubry set 4541
 Auroral electrojet index (AE) 8521
 Auroral zone 8521
 Auto-catalysis 4920
 Autocatalytic set 113, 326
 Automata 4098
 Automated guided vehicle (AGV) 8438
 Automated planning 5188
 Automaton 9411
 Automorphism 2934, 8889
 Autonomous 113
 Autonomous information system 1533
 Autonomous robot 5783
 Autonomous system (AS) 4930
 Autonomy 184, 3682, 4643, 6066, 7533
 Autoparametric resonance 2323
 Autopoiesis 8040
 Autoregressive conditional heteroskedasticity (ARCH) 3475
 Autoregressive equation 9900
 Autoregressive model 442
 Avalanche 8028
 Avalanche photodiode (APD) 7249
 Avalanches 644
 Average bonds per object 1444
 Average class accuracy 1982
 Average distance 8910

- Average partial effect [2770](#)
 Averaging [8588](#)
 Averaging algorithms [7713](#)
 Avida [113](#)
 AWE [1475](#)
 Axisymmetric (concentric) KdV equation [9967](#)
 Axon [3334](#)
- B**
- B cell [4776](#)
 B3LYP [7931](#)
 B92 [7265](#)
 Babbage engine [5859](#)
 Babbling equilibrium [8125](#)
 Backbone [1395, 6538](#)
 Back-propagation [4869](#)
 Bag [4340](#)
 Bagging [3475](#)
 Balance equations [4378](#)
 Balance theories [8265](#)
 Balanced multiwavelet [5841](#)
 Ballistic transport [7401](#)
 Banach fixed point theorem [6611](#)
 Band structure [5746, 7401](#)
 Bandwidth [9470](#)
 Baroclinic fluid [6206](#)
 Barotropic fluid [6206](#)
 Barrier options [5404](#)
 Basal ganglia [1109](#)
 Basalt [9763](#)
 “Baseline” monitoring data [9862](#)
 Basic equation of fluid dynamics [3642](#)
 Basic notation [5926](#)
 Basic reproduction rate [4659](#)
 Basin of attraction [2903, 3828](#)
 Basins of attraction [64](#)
 Basis point [3456](#)
 Bayes’ theorem; prior, likelihood and posterior distributions [456](#)
 Bayesian analysis [7853](#)
 Bayesian classifier [2159](#)
 Bayesian equilibrium [427](#)
 Bayesian game [426, 1587](#)
 Bayesian learning [5177](#)
 Bayesian parametric and non-parametric modeling [456](#)
- Bayesian–Nash equilibrium [5510](#)
 BB84 [7265](#)
 Beach profile [9618](#)
 Beam splitter [7249](#)
 Behavior [344, 5999, 6066](#)
 Behavior mode [8948](#)
 Behavior strategy [5177, 8125](#)
 Behavioral finance [4972](#)
 Behavioral relations [2284](#)
 Behavioral strategy [7616](#)
 Behavioral type [8125](#)
 Behavior-based control [3682](#)
 BEKK [4114](#)
 Belief learning [5177](#)
 Bell inequality [7250](#)
 Bell states [7250](#)
 Bell’s inequality [1012](#)
 Belousov–Zhabotinsky (BZ) reaction [7548](#)
 Benchmarks [4643](#)
 Benjamin–Feir instability of water waves [9967](#)
 BEP [1307](#)
 Bernoulli measure [2981](#)
 Bernoulli shift [2918, 4983](#)
 Bernoulli’s equation [9967](#)
 Berry phase [4194](#)
 Besicovitch pseudometrics [2232](#)
 Bessel process [8708](#)
 β -Sheet [9750](#)
 Bethe lattice [608](#)
 BGK models [866](#)
 BGP (border gateway protocol) [4930](#)
 Biome [5535](#)
 Bid price [5392](#)
 Bid-ask spread [5392, 5404](#)
 Bi-directional QKD, or “Plug & play” QKD [7265](#)
 Bifurcation [381, 936, 1041, 2324, 4515, 5299, 6195, 6329, 6697](#)
 Billiard ball model [7696](#)
 Binarization [1983](#)
 Binary [8690](#)
 Binary forecast [2438](#)
 Binary neighborhood system (binary granular model; binary GrC model) [4339](#)
 Binary relation [8346](#)
 Bingham liquid [9763](#)
 Biochemical oscillation [525](#)
 Biochemical reaction network [511](#)

- Biochemically, genetically and genomically (BiGG) structured reconstruction 5535
- Biocomposite 1283
- Bioinformatics 2697
- Biological function 719
- Biological swimmers 549
- Biologically-inspired computational algorithm 113
- Biologically-inspired optimization 1775
- Biomass function 5535
- Biomimetics 1283
- Biomineralization 1283
- Biomolecular network 570
- Biomolecule 570
- Bionanomachines 7026
- Bipartite graph 8346
- Bipartite network 6048, 8232
- BIRCH 5051
- Bit 1011, 7201, 7361
- Bit-flip 7266
- Bit-flip error 7325
- BKL 7931
- Black box model 7088, 7119
- Block 6913
- Block mapping 148
- Blocking word 2232, 9246
- Blockmodel 6914, 8279
- Blockmodel image 6914
- Blockmodeling 6914, 8265, 8346
- Blow up 2039
- Blue-tongue disease in Europe 1096
- Bluetooth 2072
- BO 7931
- Bode plot (phase and gain plot) 8948
- Body waves 2497
- Boltzmann equation 7807
- Boltzmann–Gibbs distribution, the 2801
- Boltzmann–Gibbs entropy 2859
- Bond percolation 1443, 6538, 6579
- Bonding mechanism 5618
- Book-to-market ratio 3391
- Boolean algebra 7361
- Boolean functions 1789
- Boolean network 511
- Bootstrap 3456
- Bootstrap percolation 608
- Bore 9618
- Bore solitons 8506
- Bose–Einstein condensation (BEC) 9679
- Bose–Einstein particles 7201
- Boson 9679
- Boson peak 2827
- Bottleneck 3143, 9302
- Bottom-up fabrication 5859
- Boundary region 7787
- Bounded rationality 3374
- Bounded-rationality 92
- Boussinesq equation 9967
- Boussinesq equations 9618
- Box 3924
- Box diameter 3924
- Box dimension 3827
- Box splines 5800, 6855
- BQP complexity class 7155
- Bragg glass 2019
- Braitenberg vehicle 3682
- Branch 4820
- Branch switching 6330
- Branched polymers 6545
- Branching 4820
- Branching process 2556
- Branes, D-branes 1642
- Breaking waves 8465
- Breakthrough time 6565
- Breit–Wigner (BW) resonances 7290
- Brillouin zone 689
- Broker 1565, 9565
- Broker’s broker 1565
- Broker-dealer 1565
- Brokers 5404
- Brouwer degree 6611
- Brouwer fixed point theorem 6611
- Brownian dynamics 8730
- Brownian motion 3879, 5859, 6228, 7520, 8708
- B-splines 6855
- BSS 271
- Bubble collapse 6956
- Bubbly flow 9763
- Bubbly liquid 9872
- Bulk material 5889
- Business dynamics 665
- Business policy and strategy 665
- Bytecode 131

C

C++ 131
 C# 131
 CA 866, 7931
 CACTUS 5051
 Cadherins 913
 Calibration 4751
 Call markets 5404
 Camera-in-hand configuration 42, 4751
 Camera-to-hand configuration 42, 4751
 Camshift algorithm 5702
 Canalization 525
 Canard 7603
 Canonical 1-form 2261
 Canonical transformation 2261
 Cantor set, Cantor dust, Cantor family, Cantor stratification 2261, 4515
 Capillary dominated flow 6565
 Capital 2284
 Capital asset pricing model (CAPM) 3391, 3475
 Capital intensive 2284
 Capitalist sector 2284
 Capitalist system 2284
 CAPM 4114
 Carbó (similarity) index 7422
 Carbon dioxide fertilization and quality of food 1096
 Carbon nanotube 5859
 Carbon nanotube field effect transistors 7480
 Car-following model 9430
 Carrier sense multiple access (CSMA) 2054
 Cartesian theater 1109
 Cascade model 2538
 Cascadia 1689
 Case 1791
 Case-based reasoning 4283
 Casimir function 2261
 Castaing distribution 8521
 Catalysis and auto-catalysis 3284
 Catalyst's activity 1307
 Catalyst's selectivity 1307
 Catastrophe 703
 Cauchy problem 2039
 Cauchy–Schwarz inequality 4318
 Causal loop diagram 7052
 Causal loops 9043

Causality 4609
 Cause map 1845
 CC 7931
 CCC 4114
 CCDF 4930
 CE 7931
 Čech–Stone compactification of $\mathbb{N}, \beta\mathbb{N}$ 3040
 Celery 4839
 Cell 866, 922, 1738
 Cell fate 1181
 Cell lineage 1181
 Cell type 1181
 Cells 848
 Cellular automata 63, 779, 823, 901, 2980, 6804, 8050, 8421
 Cellular automata (CA) 113, 9159
 Cellular automata rule 63
 Cellular automaton 741, 755, 768, 800, 866, 3538, 4497, 4739, 5859, 6772, 7548, 7679, 8028, 8066, 8375, 8869
 Cellular automaton (CA) 892, 3233
 Cellular automaton with block rules 7679
 Cellular programming 3233
 Cellular-computing architecture 8869
 Center 2261
 Center-saddle bifurcation 2261
 Central configurations 5959
 Central executive agent (CEA) 1109
 Central limit theorem, the 3318
 Centrality 4820, 8279
 Centroid 2449
 Centroid moment tensor solution 9593
 CGCM 9014
 CHAMELEON 5051
 Change determination process 5999
 Change opportunity model 5999
 Changes in the pollen season and new pollen 1096
 Channel 7343
 Chaos 4178, 4515, 7873, 8028, 8521, 8948
 Chaotic 476
 Chaotic hypothesis 989
 Chaotic system 368
 Chaotic systems 989
 Characteristic function form game 1518
 Characteristic or coalitional function 1509
 Cheap-talk game 8125
 Chemical Fokker–Planck equation (CFPE) 8730

Chemical gels	6545	Climate variability pattern	2
Chemical Langevin equation (CLE)	8730	Climate variables and forcing	2
Chemical master equation (CME)	8730	CLIQUE	5051
(Chemical) Organization	326	Clique	8232
Chemisorption	1307	Clonal selection theory	4776
Chemotaxis	913	Close binary stars	381
Chern class	2261	Closing CA	9246
Chinese room argument	1109	Closure	326
ChIP-chip	3965	Closure property	800
Chiral, achiral and racemic	3284	Closure relation	4317
Choice set of $f \in F$ from $A \subseteq W(Ch_f(A))$	9655	Club	5360
Choked flow	9872	Cluster	608, 2348, 5051, 6380, 6538, 6783, 7822
Chordal SLE	8709	Cluster analysis	1226
Choreographical solution	5959	Cluster State	7250
Chromatin	3894, 3965	Clustering	2348
Chronic illness	4577	Clustering coefficient	2531, 8910
Chronological algebra	1028	Clustering coefficient C	6049
Chronological calculus	1028	CMT centroid moment tensor	2657
Church–Turing (CT) computation	271	(c_n)-Conservative system	3083
Church–Turing thesis, the	9127	Cnoidal waves	9967
Chymotrypsin	9750	CNOT gate	7325
CI	7931	CO ₂	9014
City	7953	Coadjoint orbit	5483
City size distribution	1041	Coarse-grained dissipation	8521
C ^k Conjugacy	3096	Coarse-graining	8521
C ^k topology	4723	Coarsening	3612
Class	131	Co-clustering	5051
Classical computer	7119	Cocycles and group extensions	8555
Classical computing	7201	Coda attenuation factor Q_C^{-1}	7914
Classical limit	7135	Coda waves	2497, 7914
Classical statistical mechanics	5667	Codimension	703, 6330
Classically allowed and forbidden regions – turning points	6748	Coevolution	113, 3233, 8364
Classical-map hyper-netted-chain (CHNC)	8576	Coexistence	6626
Classification	1826, 1983	Cognition	4893
Classification accuracy	1983	Cognitive dynamics	9411
Classification of objects	4413	Cognitive map	1845
Classification task	1790	Coherent light	6388
Classifier	1826, 1983	Coherent structure	8521
Clausius entropy	2859	Coherent superposition	7219
Clearing	5405	Cointegration	2758
Client	4474	Cointension	3985
Climate change	2215	Collective intelligence	6476
Climate change related direct health effects	1095	Collective or social choice problem	9932
Climate models	2, 7591	Collective variables	1538
Climate simulation	2	Collision	866
Climate time scales	1	Collision and singularities	5960
		Collision-based computer	7548

- Column subshift 9246
 Comb model 310
 Combinatorial optimization 6407
 Combinators 5286
 Combi-QSAR – combinatorial QSAR 7071
 Commercial 2284
 Commission 1565
 Commodity-based economy 8364
 Common intermediate language 131
 Common prior and consistent beliefs 426
 Common values 9933
 Communication channel 7361
 Community 1141, 3110
 Community empowerment 3110
 Community safety group 3110
 Compact visitation 310
 Compaction 8457
 Compaction-like solution 8457
 Compartments 2711
 Compatible observables 4317
 Competition and cooperation 8040
 Complementary metal-oxide-semiconductor (CMOS) 5859
 Complete 8232
 Complete graph 8380
 Complete information 7651
 Complete path planner 5783
 Completely revealing strategy 7631
 Complex adaptive system (CAS) 113
 Complex and evolving structural systems 2421
 Complex developmental system 1873
 Complex disease 9090
 Complex dynamics 7583
 Complex (MHC) 4776
 Complex networks 234
 Complex phenotype 9106
 Complex project 1845
 Complex system 113, 3754, 7009
 Complex systems 1268
 Complex trait 3965
 Complexity 149, 201, 3267, 3300, 4178, 8040, 9211
 Complexity (descriptor) index 9211
 Complexity in space 3574
 Complexity in time 3574
 Complexity measures 4820, 7713
 Complexity mechanism 8364
 Complexity organizational knowledge 8364
 Complexity theory 8364
 Component 6495, 8232
 Composite 1283
 Compositional strand asymmetry 3894
 Compositionality 5286
 Computable 5467
 Computation 922
 Computational algebra systems 131
 Computational complexity 7089, 7119
 Computational fluid dynamics 8153
 Computational mathematics systems 131
 Computational particle 257
 Computational universality 901, 5859
 Computer 7361
 Computer architecture 5859
 Computer generated imagery (CGI) 1335
 Computer language 131
 Computer programming language 131
 Computing 922, 9127
 Computing agent 7533
 Concentration indices 4609
 Condensation 8246
 Condition D1 8125
 Conditional measure 4983
 Conditionally periodic 2262
 Condorcet jury theorem 9933
 Condorcet paradox 9933
 Condorcet winner 9943
 Conductance exponent (t) 3737
 Conductance (G) 3737
 Conductance quantization 7663
 Conduit 9763, 9785
 Confidence 5206
 Confidence ellipse 4250
 Configuration 5618, 7154, 8066
 Configuration recognition 5618
 Configuration space 8380
 Configuration space and the shift 2980
 Confining potential 8576
 Conflicting constraints 8364
 Conformal invariance 8709
 Conformal transformation 8709
 Confusion matrix 1983
 Congested traffic 9302, 9355
 Conjugacy 3096
 Conjugate co-ordinates, canonical co-ordinates 2262

- Connectance(C) 3661
 Connected 8346
 Connected graph 4820
 Connectionist models 1109
 Connective stability 2053
 Connectivity 6565, 6833
 Connectivity correlation 2711
 Connectivity distribution or degree distribution 2531
 Connectivity matrix 599, 5051
 Connectivity- k (k -connected, k -cohesive, structural co-hesion, cohesive.blocks) 4608
 Conservation law 866, 4713
 Conservative, dissipative 8168
 Conservative system 3083
 Conservativeness 3056
 Consistent estimator 6991
 Constitutive equations 4378
 Constraint 2827
 Constraint-based analysis 511
 Constraint-based reconstruction and analysis (COBRA) 5535
 Construction 8067
 Construction universality 5859
 Constructive system 8040
 Consumer behavior 5377
 Consumer-resource interactions 3661
 Continuation 6330, 6587
 Continuation game 4098
 Continuity equation 866, 9967
 Continuous and discrete dynamical systems 936
 Continuous phase transitions 7873
 Continuous problem 7119
 Continuous simulation 4562
 Continuous space machine (CSM) 6388
 Continuous stochastic process 6228
 Continuous time random walk 5218
 Continuous two-sided matching model 9654
 Continuum 1475
 Continuum forecast 2438
 Continuum hypothesis 9967
 Continuum limit 8709
 Continuum media approximationj 8588
 Continuum percolation 1444, 6565
 Control 1475, 6066
 Control function 1486
 Control parameter 3597, 5718, 8926
 Control parameters 1538
 Control parameter(s) 3612
 Control system 3524
 Control systems and reachable sets 5440
 Controllability 1027, 3524
 Controllability to trajectories 4804
 Controller 9470
 Controlling feedback 2284
 Convex 7520
 Convex space 5536
 Convolution 2657
 Cooper pairs 9679
 Cooperative control 7713
 Cooperative game 1509
 Coordination 9471
 Coordination dynamics 1537, 8199
 Copying-fidelity 3206
 Core 1509, 1660, 5359
 Core group 4659
 Core set 7422
 Corner frequency 2474, 2581
 Corona 9268
 Corporate 2284
 Corporate (or commercial) customers 5405
 Corrections to scaling 6991
 Correlated equilibrium 427
 Correlated equilibrium, a 8698
 Correlated random effects 2770
 Correlation 1616
 Correlation dimension 3828
 Correlation energy 8576
 Correlation function 1268, 1616, 3360, 3779, 8521
 Correlation hole 8576
 Correlation length 1395, 6538, 8709
 Correlation time 6991
 Correlations 1268
 Cortex 1109
 Coseismic 1689
 Cosmic evolution 3267
 Cosmic microwave background 1634
 Cosmic strings 1642
 Cosmology 3267
 Cost function 1660
 Cost of an algorithm 7119
 Cost of voting 9932
 Cost sharing problem 1660
 Cost sharing rule 1660

Cotangent bundle 5483
 Couette flow 4997
 Coulomb blockade 5859, 7309
 Coulomb plasticity 10047
 Counterpropagation neural network 2139
 Coupled map lattice 2712
 Coupler link rules 8815
 Coupling constant 8576
 Coupling of two measure spaces 4983
 Coupons 9565
 COV 4080
 Covalent bond 6013
 Covariance 3859
 Covariates 5999
 Covered interest arbitrage 5405
 Cowles commission approach 5552
 CP 7931
 Crack wave 9872, 9900
 Crapper's nonlinear capillary waves 9967
 Crawling 5266
 Creep 2019
 Criterion 7753
 Critical 476
 Critical behavior 1443, 6772
 Critical behavior of dynamical properties 1444
 Critical curves 8709
 Critical dimension 3360
 Critical earthquake concept 7853
 Critical equations 4541
 Critical exponent 1395, 6783, 7822
 Critical exponents 6538, 7873
 Critical fractional volume 1444
 Critical gels 6545
 Critical part of the spectrum 936
 Critical phenomena 866, 7873
 Critical phenomenon 4903
 Critical point 3779, 5021
 Critical point, threshold, onset 3612
 Critical properties and scaling 644
 Critical slowing down 5667
 Criticality 8521
 Criticality (in physics) 7009
 Cross national comparisons 2792
 Cross section 9246
 Crossbar array 5859
 Crossing number 9268
 Crossover 3754, 4134, 8521

Crowd 3142, 6476
 Crowd disaster 3143
 Crowd turbulence 6476
 Cryosphere 1, 1705
 Cryptography 7361
 Crystal lattice 8465
 Crystallization 9763
 C-SIGN 7250
 CSS code 7325
 Culling process 608
 Cultural evolution 3205
 Culture 3205
 Cumulated payoff 5588
 Cumulative probability 2801
 CURE 5051
 Current mirror 9706
 Current sheet 8521
 Curse of dimensionality 719, 1775
 Curvature 3040
 Cusp 8521
 Cusps 1642
 Cut 8246
 C-value 489
 CWT 6352
 Cybernetics 8974
 Cycle 4820, 8346
 Cycle time 9471
 Cyclic mapping 149
 Cyclic states 64
 Cyclic triad 8320
 Cyclicity 4820
 Cylindrical Wiener process 6228
 Cytoskeleton 1738

D

Darboux chart, Darboux co-ordinates, Darboux basis 2262
 Dark count 7266
 Data cleaning 1983
 Data (information) model 4305
 Data (information) table 4305
 Data mining 1775, 1983, 2348, 4145, 4356, 4392, 7729
 Data mining or physics of traffic – two different approaches to traffic prediction 9502
 Data object 1983

Data preprocessing/preparation	1983	Degree exponent γ	6048
Data set	1983	Degree of a node	3924
Data space	511, 2348, 2449	Degree of freedom	1475, 2262
Data transmission system	2395	Degree rank	4930
Data vector	2348	Degrees of freedom	2827, 6426
Database	7729	Delay	9043, 9471
DBSCAN	5051	Delayed feedback	627
DCA	7931	Delay-insensitive circuit	5859
DCC	4114	δ -function	4317
Deadlocked path planning	5783	Delta-hedge	5405
Dead-reckoning	2072	Demand game	1660
Dealer	1565	Demand revelation game	1660
Dealership market	5405	Denaturation	9750
Debye layer	5573	Dendrite	3334
Debye length	5573	Dendritic cell	4776
Debye–Hückel approximation	5573	Dendrogram	1141
Decentralized control	113, 5618	Density	8232
Decidability	801	Density classification	3233
Decision making	4972	Density function (DF) tags	7422
Decision node	1826	Density-based partitioning	5051
Decision problem	9160	Deoxyribozyme	5632
Decision rule	1790, 4283, 4412, 7753	Deoxyribozyme-based automaton	5632
Decision system	4412	Deoxyribozyme-based logic gate	5632
Decision systems	1790	Dependence assumption	8320
Decision tree	2160, 4739	Dephasing	4195
Decision under uncertainty	7753	Depth	9565
“Decision window”	9862	Dereferencing	8084
Declarative language	131	Description logic	4412
Declustering	7873	Design pattern	131
Decoherence	7219, 7361	Design principle	719
Deconvolution	2657	Detailed balance principle	5667
Decoupler link rules	8815	Detector	6388, 9471
Deduction	201	Deterministic	476
Deep earthquake	2657	Deterministic automaton	4739
Deep water	8112, 8465	Deterministic chaos	2712, 2903, 6195
Deepness	5326	Deterministic continuous model	554
Defect	6195	Deterministic evolutionary dynamic	3176
Defect-tolerant	5859	Deterministic system	368
Defender	4947	Deterrence	4855
Deficit angle	1642	Development	1873
Defining system	6330	Developmental domains	1873
Defuzzification	4869	Developmental states, stages and ages	1873
Degassing n. (degas v.)	9763	Developmental Systems Theory	1916
Degeneracy (or near-degeneracy)	8320	Developmental time scales	1873
Degree	4487, 4930, 6495, 8232, 8816	Deviations	5326
Degree distribution	489	Device	5859
Degree distribution $P(k)$	6048	DEVS	344

- DFT [1307, 7931](#)
Diagram of congested patterns [9356](#)
Dialectical relation [8183](#)
Diameter D [6049](#)
Dictator game [4609](#)
Dielectric breakdown model [3720](#)
Dielectric material [5859](#)
Dielectrophoresis [5573](#)
Diffeomorphism [703](#)
Differentiable rigidity [3095](#)
Differential adhesion [525](#)
Differential gene expression [525](#)
Differentiation [1181, 9763](#)
Diffuse interface [9872](#)
Diffuse interface theory [8153](#)
Diffusion [866, 1956, 6783](#)
Diffusion of innovation [5377](#)
Diffusion processes [8265](#)
Diffusion-limited aggregation [3720](#)
Digital [9128](#)
Digital circuit [9706](#)
Digital images [10031](#)
Digital organism [113](#)
Digraph [6239, 8232, 8346](#)
Dihedral angle rotation [6013](#)
Dilation matrix [589](#)
Dimension [3827](#)
Dimension group [8889](#)
Dimensionality reduction [1775, 1983](#)
Dimensionless density [6505](#)
Diode [9706](#)
Diophantine approximation [3029, 3040](#)
Diophantine condition, Diophantine frequency vector [2262, 4515](#)
Diploid [9106](#)
Dirac delta function [3334](#)
Direct costs [1082](#)
Direct method [8730](#)
Direct scattering problem [4960](#)
Direct search [2449](#)
Directed graph [6048, 8346](#)
Directed line [8346](#)
(Directed) walk [6239](#)
Directed/Undirected graph [1244](#)
Directional dynamics [9246](#)
Disaster [3110](#)
Disaster lead time [3110](#)
Disaster threat [3110](#)
Discontinuous Galerkin method [7892](#)
Discount factor [1082](#)
Discount rate [1082, 3456](#)
Discrete entity simulation [4562](#)
Discrete least squares fitting [5800](#)
Discrete problem [7119](#)
Discrete ridgelet transform (DRT) [1718](#)
Discrete symmetry [9644](#)
Discrete two-sided matching model [9654](#)
Discrete variational mechanics [2003](#)
Discrete wavelet transform (DWT) [10007](#)
Discrete multiwavelet transform (DMWT) [5841](#)
Discretization [1983, 7797](#)
Disjoint measure-preserving systems [5037](#)
Disordered solids [8588](#)
Disordered system [6407](#)
Dispersal limitation [2697](#)
Dispersion [2474](#)
Dispersion, amplitude [9618](#)
Dispersion, frequency [9618](#)
Dispersion relation [9967](#)
Dispersive estimate [2039](#)
Disruption and delay [1845](#)
Dissipative structures [8364](#)
Distance [3924, 4820, 6833, 8232, 8910](#)
Distance functions (metrics) [1790](#)
Distortion estimate [8168](#)
Distributed algorithm [7713](#)
Distributed parameter system [1486](#)
Distribution function [8690](#)
Disulfide bond [9749](#)
Diurnal cycle [8140](#)
Dividend-price ratio and dividend yield [3448](#)
Divinity [8125](#)
DLA [866](#)
DLVO [7931](#)
DNA [417, 2089, 2104](#)
DNA binary counter [5632](#)
DNA circuit [5632](#)
DNA computing [5632](#)
DNA logic gate [5632](#)
DNA Sierpinski triangle [5632](#)
Domain [768, 10059](#)
Domains of life [1738](#)
Domain-specific language [131](#)
Dome [9763](#)

Domiciliary care 4562
 Dominance 7753
 Dominance-based rough set approach (DRSA) 4283
 Dominant strategies 5510
 Dominant structure 8948
 Domination 1518
 DOS 1307
 Double-crossover (DX) motif 2104
 Doubling map 3084
 Downscaling 7591
 Downsian model of political competition 9933
 Downward causation 113
 DQOS 7422
 Drainage 4947
 Drift Alfvén vortex 8521
 DS flow 381
 Dual graph 6579
 Dual space 4317
 Ductile shear zone 657
 DWT 6352
 Dyad independence 8320
 Dyad-wise shared partners 8320
 Dyke 9764
 Dynamic cellular computing system 8869
 Dynamic complexity 4562
 Dynamic core 1424
 Dynamic decomposition weights (DDW) 8948
 Dynamic heterogeneity 4210
 Dynamic method invocation 131
 Dynamic modeling 7052
 Dynamic network analysis 113
 Dynamic planning 9536
 Dynamic programming 6272
 Dynamic programming principle 6219
 Dynamic rupture model 4435
 Dynamic stress change 2600
 Dynamic stress drop 2538, 2581
 Dynamic systems (developmental) 1873
 Dynamic traffic assignment 9430
 Dynamical complexity 8521
 Dynamical phase 4194
 Dynamical renormalization group 8521
 Dynamical scaling and exponents 7873
 Dynamical symmetry 9644

Dynamical system 368, 719, 866, 1932, 2933, 3016, 5450, 6175, 6329, 6939, 7603, 8420, 8630, 8927, 8974
 Dynamical system (DS) 381
 Dynamical systems theory 989, 4893
 Dynamics 1948, 8040

E

E91 7265
 EAC 271
 Early adopters 5377
 Early and late majority 5377
 Earthquake 657, 4178
 Earthquake catalog 2348
 Earthquake early warning 9593
 Earthquake early warning system (EEWS) 2396, 2497
 Earthquake early-warning 2449
 Earthquake forecasting 4179
 Earthquake forecast/prediction 7853
 Earthquake location 2396, 2449
 Earthquake magnitude 2396
 Earthquake mechanism 2556
 Earthquake precursor 2497
 Earthquake prediction 2497, 2621, 4179
 Earthquake preparedness 4179
 Earthquake quantities 5021
 Earthquake size 2474
 Earthquake source 2474
 Earth-system models of intermediate complexity 2
 Eccentricity 4820
 Echo 113
 Ecological community 2697
 Ecological drift 2697
 Economathematicians 2792
 Econometrics 9034
 Economic dualism 2284
 Economic sector 2284
 Economics 201, 1082
 Economy, an 5360
 Econophysicists 2792
 Econophysics 2792
 Ecosystem 2697
 Ecosystem shifts 2712
 Edge 8232, 8346

- Edge betweennes 6049
 Edge labeled graph 8346
 Edge-wise shared partner distribution 8320
 Edge-wise shared partners 8320
 Education 1873
 Effective dimension 8816
 Effective mass 8576
 Effective medium approximation 1395
 Effective medium theory (EMT) 3737
 Effective risk communication 3110
 Effective temperature 4210
 Effects 5999
 Effectual bottleneck 9282, 9356
 Efficiency 3327, 9933
 Efficient markets hypothesis (EMH) 3374
 Egalitarianism 9933
 Ego-network 8232
 Eigen energy and eigen wave function 4194
 Eigenfield 3334
 Eigenvalue 4930, 8948
 Eigenvalue and eigenvector 4317
 Eigenvalue and spectrum 936
 Eigenvalue elasticity analysis (EEA) 8948
 Eigenvector 8948
 Eigenvector elasticity analysis (EVA) 8948
 El Niño-southern oscillation (ENSO) 1071
 Elastic 1689
 Elastic interaction 8479
 Elastic manifold 1126
 Elastic networks 6545
 Elastomer 294
 Electric double layer (EDL) 5573
 Electrical deep brain stimulation (DBS) 627
 Electro-kinetic effect 2621
 Electromechanical effects 5912
 Electron gas parameter r_s 8576
 Electronic communications networks (ECN) 9565
 Electronic structure 5912
 Electronic structure problem 6689
 Electroosmosis 5573
 Electrophoresis 5573
 Electrophoretic mobility 5573
 Electrowetting 5573
 Electrowetting on dielectric (EWOD) 5573
 Elementary set 7787
 Elementary Swarm 8869
 Elliptic 2262
 Ellipticity/parabolicity 6218
 Elsässer variables 8010
 Embedding 8889
 Embodied 4643
 Embodied agent 2844
 Emergence 113, 201, 4631, 6476, 8040, 8364, 8420
 Emergency 3110
 Emergent patterns 1041
 Emergent phenomenon 768
 Emergent properties 9411
 Emobodied energy (emergy) 2697
 Enabling behaviors 8364
 Enabling rules 8364
 Enantiomers and enantiomeric excess 3284
 Encapsulation 132
 End-effector 9749
 Endocytosis 9750
 Endogenous 8967
 Endogenous and exogenous games 5588
 Endogenous mechanisms 2792
 Endogenous variable 5552
 Endomorphic agents 344
 Endosome 9750
 Energy 3267
 Energy rate density 3268
 Energy release rate 2581
 Energy shell 2262
 Energy-momentum map 7135
 Ensemble 1983, 5317
 Entangled state 7250
 Entanglement 7201, 7219, 7361, 8364
 Enthalpic elasticity 7026
 Entrepreneurship 2284
 Entropic elasticity 7026
 Entropic profile 489
 Entropy 113, 4713, 5860, 6939, 7361, 9127
 Entropy maximizing 1041
 Entropy, measure-theoretic (or: metric entropy) 953
 Entropy, topological 953
 Enumeration algorithm 5618
 Envelope broadening 7914
 Environment 185, 4194, 7520
 Environment-dependent tight-binding potential 9137
 Envy-freeness 3327
 Enzyme 2089

- EO 1307
 Epicenter 2449, 2497
 Epidemic threshold 4659
 Epidemiology 4562
 Epigenesis 1916
 Epigenetic inheritance 1916
 Epigenetics 3965
 Epimerization and racemization 3284
 Epipolar constraint 4751
 Epistasis 489, 3965, 9106
 ε -Approximation 7119
 Equicontinuity 243, 978
 Equicontinuity point 243, 978
 Equicontinuous CA 2232, 9160, 9247
 Equicontinuous configuration 2232, 9246
 Equidistributed 3040
 Equilibrium 1041, 1268, 2215, 4098, 5667, 6329, 7631, 8364, 9225
 Equilibrium, an 8698
 Equilibrium concept 4788
 Equilibrium outcome 8125
 Equilibrium path 4098
 Equilibrium state 6940
 Equilibrium states 866
 Equitability 3327
 Equity premium puzzle 3456
 Equity weights 1082
 Equivalence class 7787
 Equivalence of dynamical systems 936
 Equivalence Relation 4340
 Equivalence relation 7787
 Equivariance 5483
 Equivariant system 5299
 Erdős-Rényi network 489
 Erdős-Rényi random graph $G(n, p)$ 7493
 Ergodic 3040, 5450
 Ergodic average 2934
 Ergodic decomposition 3084
 Ergodic law 7520
 Ergodic measure preserving transformation 4983
 Ergodic system 3084
 Ergodic systems 989
 Ergodic theorem 2934, 3084, 4983
 Ergodic theory 3029, 3040, 6939
 Ergodicity 866, 953, 3056, 5667, 7164
 Ergodicity, weak mixing, mild mixing, mixing and rigidity of \mathcal{T} 8555
 Error 2450
 Error correcting code (ECC) 5860
 Error correction 7201
 Error correction model 2758
 Error syndrome 7325
 Error-correcting code 7361
 Escape rate formula 989
 Estimate of y_i would be obtained as, the 4080
 Estimator 6991
 Euclidean distance (similarity) index 7422
 Euclidean reconstruction 42
 Eukaryote 3894
 Eukaryotic cell 1738
 Euler equations 9967
 Evacuation 3110, 3142
 Evaluation 5349
 Evaluation of stage payoffs 8698
 Evaluative responses 2242
 Evanescent mode 7663
 Evaporative cooling 9679
 Event history analysis 8306
 Evolution 201, 3268, 8040
 Evolution (artificial) 113
 Evolution equations 2039, 6228, 8926
 Evolution in materio 3221
 Evolution of fuzzy systems 4696
 Evolution of wave functions 4194
 Evolution rule 5524
 Evolution strategies 113
 Evolutionarily stable equilibria (ESS) 6639
 Evolutionarily stable strategy (ESS) 3176
 Evolutionary algorithm 113, 3221
 Evolutionary algorithms/evolutionary computation 4133
 Evolutionary computing 113, 4869
 Evolutionary game 113
 Evolutionary game theory 5677
 Evolutionary optimization 6476
 Evolving system 3243
 Ex ante equity premium 3456
 Ex post equity premium 3456
 Exact controllability 4804
 Exact equivalence 8333
 Exact, inexact notion 1790
 Exact solution 5144
 Example (also instance or case) 5317
 Exchange energy 8576

Exchangeability 456
 Excitability 1352
 Excitability level 1352
 Excitable medium 7549
 Excitable system 7549
 Excluded volume 1444, 6505
 Exclusion principle 866
 Exobiology 3268
 Exogenous 5552
 Exogenous factors 2792
 Exosystem 9078
 Expandable limit order 5405
 Expanded congested patterns 9356
 Expansive CA 2232, 9247
 Expansivity 243, 978
 Expected value 3317
 Experiment 2792
 Expert systems 4869
 Exp-function method 8453
 Exploration 8709
 Explosive eruption 9764
 Exponent relation 8521
 Exponential growth 1041, 4920
 Exponentially stable Hamiltonian 5987
 Extended memory 2758
 Extended similarity scaling (ESS) 8521
 Extended system 4902
 Extensible markup language (XML) 4305
 Extension principle 3985, 4060
 Extensive form 4855
 Extensive system 2859
 External factors 1
 External noise 3360
 External stability 1519
 Extinction thresholds 2712
 Extracellular matrix (ECM) 913
 Extreme event 8364
 Extreme events 3300, 4179
 Extreme pathways (ExPa) analysis 5536
 Extreme value theory 8521
 Extrinsic calibration parameters 42
 Extrinsic effect 8104
 Extrinsic noise 8730
 Extrinsic uncertainty 4317
 Extrusive flow or eruption 9764

F

Facilitator 4474
 Factor map 2883, 8889
 Factor model 3475
 Factual statement 9862
 Failure to predict 2438
 Fainted laser source 7265
 False alarm 2438
 Fano resonances 7290
 Far from equilibrium 8364
 Far-field 2497
 Farsighted stable set 1519
 Fast acceleration of unemployment (FAU) 3301
 Fast convergent (Newton) method 5064
 Fast dynamics 1042
 Fast slant stack (FSS) 1718
 Faster-is-slower effect 6476
 Fault 657, 2497
 Fault model 7853
 Fault parameters 9631
 Fault slip 2497
 Fault strength 2538
 Fault-tolerant 5860
 Fault-tolerant computation 7361
 Fault-tolerant quantum computing 7325
 FBm 4947
 Fcc 1307
 Feasible assignment 9655
 Feature 1983, 5349, 7787
 Feature extraction 1983, 2348
 Feature point 42, 4751
 Feature selection 1775, 5349
 Feature space 2348
 Feature transformation 1775
 Feature vector 2348
 Features 2348
 Fecundity 3206
 Feedback 1042, 4562, 7052, 8990, 9043
 Feedback control 3944
 Feedback loop 4577, 8967
 Feedback loops 2284
 Feedback networks 1813
 Feedback trading 5405
 Feedbacks 3
 Feedforward control 3944
 Feedforward network 1813

- Fermi hole 8576
 Fermi surface 9679
 Fermi–Dirac particles 7201
 Fermion 9679
 FHP model 866
 Fiber tracts 913
 Fibonacci sequence 792
 Field 132, 257, 3334
 Field computation 3334
 Field potential 6099
 Field scale 6565
 Field space 3334
 Field theory 3360
 Field transformation 3334
 Field-effect transistor (FET) 5860
 Field-programmable gate array (FPGA) 5860
 Filament 1738
 Filter 6855, 10007
 Filter bank 10007
 Filter process 6855
 Filter taps 10007
 Filtered probability of a regime 2745
 Final set 4497
 Financial customers 5405
 Financial forecasting 3475
 Financial market 2284
 Fine-grained parallelism 5860
 Finite automaton 4739, 5860
 Finite configurations 755
 Finite difference method 5161
 Finite dynamical system 160
 Finite element and macro-element 5800
 Finite equivalence 8889
 Finite size scaling 6565, 6991, 7873
 Finite state machine 113, 3682, 8050
 Finite tiling problem, the 9160
 Finite time attractor 9247
 Finite-size scaling 5667
 FINRA 1565
 FIPS 1565
 Firing number 1352
 First generation discrete curvelet transform (DCTG1) 1718
 First and second laser thresholds 6116
 First law of thermodynamics 9127
 (First order) density function (DF) 7422
 1st Postulate of quantum mechanics 4317
 First-order cybernetics 1109
 First-reaction method 8730
 Fitness 489, 3206, 4134
 Fitness landscape 6639
 Fixed effects estimation 2770
 Fixed point, stable 8927
 Flatness 3524
 Flatness (kurtosis) 8521
 Flip-flop circuit 9707
 FLm 4947
 Floating-gate transistor 9707
 Floppy mode 2827
 Floquet theory 2324
 Flow 3143, 4577, 8990, 9043, 9471
 Flow map 3256
 Flow payoff 7651
 Fluctuating forces 8927
 Fluctuations 5326
 Fluency 2242
 Flux 1395
 Flux function 4713
 Flux-balance analysis (FBA) 5536
 Fluxon 8465
 Focal mechanism 2497
 Focus-focus type 2262
 Fokker Planck equation 8927
 Fokker–Planck equation 3574, 8690, 8766
 Fokker–Planck equation, the 2801
 Fokker–Planck–Landau equation 7807
 Foliation 4723
 Folksonomy 8084
 Font conventions 2982
 Fonts 2884
 Food web 2697, 3661
 Food webs 2711
F-optimal stable matching (respectively, payoff) 9656
 Forced and/or self-organized criticality (FSOC) 8522
 Force-free field 9268
 Forecast 9862
 Forecast point 9592
 Foreign exchange dealers 5405
 Foreign exchange market 3802
 Formal concept analysis 8346
 Formal language 800
 Formal model 7052

- Formal power series 6663
 Fortuin–Kasteleyn representation (FK) 8709
 Forward market 5405
 Forward model 1689
 Fourier and Laplace transforms 5218
 FQQSPR equation 7422
 Fractal 381, 476, 866, 2253, 3720, 3737, 3802, 3822, 3847, 3893, 4609, 7873, 8522
 Fractal dimension 2253, 3822, 8709
 Fractal geometry 3016
 Fractal set 3779
 Fractal structure 1042
 Fractal system 3754
 Fractality 3858
 Fractals 6783, 7565, 7822
 Fractional differintegration 5218
 Fractional diffusion equation 310
 Fractons 3879
 Fracture 6565
 Fracture network 6505
 Freak waves 8465
 Fredkin gate 7696
 Free action 5483
 Free cash flows 3456
 Free energy 3598
 Free energy functional 6195
 Free flow 9302, 9355
 Freezing-by-heating effect 6476
 Frequency bands of electromagnetic waves 2622
 Frequency domain 8948
 Frequency-halving bifurcation 2262
 Friedmann–Robertson–Walker model 1634
 Friend request 4367
 Front 866
 Frustration 4210
 FS 1307
 F → S transition 9303
 (Full) density function 7422
 Full information maximum likelihood with optimal filtering 8990
 Full shift 8889
 Fully-developed turbulence 6195
 Function pointers 132
 Function spaces notation 5926
 Functional 3334
 Functional coefficient model 3475
 Functional data model (FDM) 4305
 Functional granulation 8333
 Functional language 132
 Functionalization 7026
 Functions: bounded, continuous, uniformly Lipschitz continuous 3256
 Fundamental diagram 3143
 Fundamental diagram approach to traffic flow theory and modeling 9303
 Fundamental diagram of traffic flow 9303
 Fundamental modes 2474
 Fundamental valuation 3456
 Further normalization 6176
 Fusion of knowledge 4413
 Fusogenic 9749
 Fuzzification 4869
 Fuzzy control 4869
 Fuzzy data mining 4146
 Fuzzy estimators 8679
 Fuzzy event and its probability 4060
 Fuzzy if-then rule 3985
 Fuzzy logic 4060, 4869, 6066
 Fuzzy logic (FL) 3985
 Fuzzy logic gambit 3985
 Fuzzy number 4019
 Fuzzy random variable 8679
 Fuzzy reasoning 6086
 Fuzzy relation 4060
 Fuzzy set 3985, 4019, 4060, 4869, 8679
 Fuzzy set and fuzzy logic 4324
 Fuzzy set and fuzzy vector 4047
 Fuzzy set theory 4019, 4145, 4355
 Fuzzy sets 4283, 7729
 Fuzzy statistical tests 8679
 Fuzzy statistics 8679
 Fuzzy system parameters 3244
 Fuzzy system structure 3243
 Fuzzy systems 4696
 F-validity 3985
 FX 5405

G

- Galois lattice 8346
 Game 5359
 Game horizon 2215
 Game of Life 8869
 Game of life 892, 4240

- Game of life, life 113
 Game theory 1509, 1660, 4098, 5677
 Gamma distribution, the 2801
 Gap exponent 6991
 GARCH 4114
 GARCH(p, q) 3456
 Garden-of-Eden 64
 Gas slug 8153, 9873
 Gate 5860
 Gatekeeper 4474
 Gaussian distribution 8522
 Gaussian thermostats 989
 GCM 9014
 Gel 294
 Gel point 6545
 Gelfand triplet 989
 Gene 4161
 Gene conversion 4161
 Gene frequency or allele frequency 5656
 Gene network architecture and topology 1180
 Gene network dynamics 1181
 Gene regulatory network (GRN) 1180
 Gene-protein-reaction association (GPR) 5536
 General congested patterns 9356
 General metabolic equation 2697
 General practitioners (GPs) 4562
 Generalized constraint 3985
 Generalized constraint language 3985
 Generalized dimension 8522
 Generalized gradients and subgradients 6271
 Generalized Langevin equation 8927
 Generalized rigidity 1268
 Generalized soliton 8457
 Generalized tracking problem 9078
 Generate-and-test 3221
 Generating function 2262, 3361
 Generation 892, 4240
 Generative social science 113
 Generic graph 6013
 Generic rigidity 2827
 Generic space 2232
 Generics 132
 Genetic algorithm (GA) 113, 3233
 Genetic algorithms 2114, 4146, 4696, 4869
 Genetic interaction 9106
 Genetic interaction (epistasis) 570
 Genetic locus 6639
 Genetic network 9106
 Genetic perturbation 9106
 Genetic programming 3233
 Genetic programming (GP) 113
 Genetic transformation 9106
 Genetic tree 3233
 Genetic-fuzzy data mining 4146
 Genome 511, 4161, 5656
 Genome/chromosome 4134
 Genome-scale 5536
 Genotype 113, 3221
 Genotyping 3965
 Geodesic 4983, 8232, 8346
 Geodesic (flow) 3040
 Geodesics 3859
 Geodesy 1689
 Geometric integrator 2003
 Geometric phase 4194
 Geometrical simulation 6013
 Geometrically weighted degree counts 8320
 Geostrophic adjustment 8465
 Geostrophic equilibrium 8465
 Gevrey spaces 6649
 GGA 1307, 7931
 GHG 9014
 Giant component 6495
 Gibbard–Satterthwaite theorem 9933
 Gibbs sampler 2745
 Gibbs state 6940
 Gillespie algorithm 8730
 Gini coefficient, the 2801
 Glass transition 4210
 Glider 892, 4240, 7549
 Global asymptotic stability 4671
 Global bus 5618
 Global climate models or General circulation models 2
 Global expansion of tropical diseases 1095
 Global Lyapunov exponent 3504
 Global positioning system 9411
 Global rigidity 3096
 Global search 2450
 Global seismographic network (GSN) 2347
 Global solution 5926
 Global workspace 1109
 Glycoprotein 9749
 GNSS 4250

- Goal-directed agents 7533
 Goal-oriented agents 7533
 Goto statement 132
 Goto–Nambu action 1642
 GPAC 271
 GPS 1689, 8851
 GRACLUS 5051
 Gradient 257
 Graduation 3985
 Grain boundary 6195
 Granuland 3985
 Granular computing 4283, 4305, 4355
 Granular computing (GrC) 4324
 Granular data 4402
 Granular fluid 4378
 Granular link 4402
 Granular matter 4378, 4997
 Granular neural network 4403
 Granular neuron 4402
 Granular structure 4324, 4339
 Granular variable 3985
 Granular weights 4402
 Granularity 4324, 5736
 Granulation 3985, 4324, 4339, 8333
 Granulation of knowledge 4413
 Granule 3985, 4305, 4324
 Graph 1141, 2728, 4820, 5266, 5656, 6013, 6495, 8232, 8346, 8380, 8816, 9211, 10058
 Graph center 4820
 Graph clustering 5051
 Graph cohesion 8279
 Graph diameter 7493
 Graph distance 4820
 Graph grammar 8816
 Graph invariant 9211
 Graph, lattice, tree 4902
 Graph metric function 8816
 Graph (network) 5692
 Graph path 4820
 Graph structure 1244
 Graph theory 8265
 Graph topology 1244
 Graph visualization 1244
 Graph-rewriting automata 8816
 Graph-theoretical distance 9211
 Gravity 848
 GRDDL 8084
 Greenhouse gases 1071
 Grid 149, 848, 2347
 Grid generation 7892
 Grid methods 5051
 Ground deformation 6956
 Ground motion intensity measures 4435
 Ground motion uncertainty 4435
 Ground state 6407
 Group 8927
 Group action 2262
 Group model building (GMB) 7052
 Group velocity 9967
 Groups 778
 Growth stocks 3391
 GSR 4644
 GT 9014
 $G(t)$ 6810
 Guaranteed possibility 6927
- H**
- Haar measure (on a compact group) 3040
 Hadamard gate 7155
 Haken–Kelso–Bunz (HKB) model 5718
 Halting 5524
 Halting problem, the 9160
 Hamilton operator 8927
 Hamiltonian 1268, 4194, 5860, 6587
 Hamiltonian dynamics 5064
 Hamiltonian Hopf bifurcation 2262
 Hamiltonian PDE 6709
 Hamiltonian system 1932, 2262, 5064
 Hamiltonian system with symmetry, a 6587
 Hamilton–Jacobi equations 4540
 Handicap principle 8125
 Haplod 9106
 Haplotype 9106
 Haptotaxis 913
 Harmonic measure 3720
 Hartree–Fock 8576
 Hausdorff α -measure 3084
 Hausdorff dimension 3029, 3827
 Hazard 3110
 Hazard zone 3110
 HCI 4644
 Headless 132
 Headway 9471

- Health 1095
 Health and Social Care 4562
 Health treatment 4562
 Heavy bottleneck 9356
 Heavy-tailed degree distributions 4487
 Heisenberg picture 7155
 Heisenberg picture in quantum mechanics 8927
 Heisenberg uncertainty principle 5860
 Helicity 8522, 9750
 Helicity integral 9268
 Heliosphere 21, 8522
 Hemagglutinin 9749
 Hermitean operator 4317
 Heterochrony 1916
 Heterogeneity 201, 8364
 Heterogeneous networks 6024
 Heterogeneous team 2072
 Heterogeneously catalyzed reactions 7566
 Heterojunction 8576
 Heteroskedasticity 4114
 HF 7931
 Hierarchical clustering 5051
 Hierarchical modeling 456
 Hierarchical organization 2531
 Hierarchy 4324
 HIGFET 8576
 Higher dimensional shift space 8889
 Higher-order programming 132
 High-temperature approximation 8588
 Highway capacity of free flow at bottleneck 9304
 Hilbert basis 2263
 Hilbert space 4194, 4317, 6723
 Hill's equation 6626
 Hippocampus 6099
 Hirota bilinear method 5138
 Histones 3894
 Holonomic constraint 9750
 HOM interference 7250
 Homeomorphism, diffeomorphism 4723
 Homo oeconomicus 8183
 Homo sociologicus 8183
 Homogeneity assumption 8320
 Homogeneous networks 6024
 Homogeneous spaces 3029
 Homogeneous team 2072
 Homography 43, 4751
 Homolog 9106
 Homomorphism 8292
 Homomorphism lattice 8292
 Homophily 8306
 Homotopy analysis method 5161
 Homotopy perturbation method 5161, 8453
 Hookean spring 7026
 Hopf argument 8168
 Horizon, cosmological 1642
 Horizontal transmission 3206
 Horocycle 4983
 Hoshen–Kopelman algorithm 6521
 Hot carriers 7401
 Household income 2284
 HPP model 866
 HRI 4644
 Hubble time 381
 Hull 6521
 Hull-generating walk 6521
 Hulls 8709
 Human activity system 4562
 Human bioclimate 1095
 Humanoid robots 1109
 Hybrid 9106
 Hybrid algorithms 8730
 Hybrid closed-loop system 4671
 Hybrid controller 4671
 Hybrid intelligent systems 4696
 Hybrid logic 8334
 Hybrid two-sided matching model 9655
 Hydraulic jump 8465
 Hydrodynamic fields 4378
 Hydrodynamic limit 7807
 Hydrodynamical equations 7807
 Hydrodynamics 4378
 Hyperbolic 8168
 Hyperbolic cellular automaton 741
 Hyperbolic dynamical system 989
 Hyperbolic geometry 792
 Hyperbolicity 953
 Hypercubic lattice 8380
 Hypercycle 113
 Hyperedge 8346
 Hypergraph 8346
 Hyper-netted-chain (HNC) 8576
 Hyperreal 6285
 Hyperstatic 6013
 Hypertext transfer protocol (HTTP) 10059

Hypocenter 2450, 2497, 2658
 Hypo-elliptic 2263
 Hypostatic 6013
 Hypothesis 6252
 Hysteresis 8522

I

Ideal chain 6833
 Idempotency 3334
 i.i.d. 4114, 7520
 Image compression 6855, 10031
 Image denoise 6856
 Image edge detection 6856
 Image inpainting 10031
 Image Jacobian 43
 Image processing 7549
 Image restoration 10031
 Image segmentation 10031
 Imitator 1956
 Immunocomputing 4739
 Imperative language 132
 Imperfect monitoring 7651
 Implementable social choice rule in an equilibrium concept (e.g. Nash equilibrium) 4788
 Implicit solvation 9750
 Implied volatility 8783
 Importance sampling 2450, 5667, 6991
 Imprecise data 8679
 Impulse 6955
 Impulse response 3334
 Imputation 1518
 Ince–Strutt diagram 2323
 Incidence 8306
 Incident 8232
 Incoherent light 6388
 Incomplete information 7651
 Incomplete information game 8126
 Incompressible word 243
 Indegree 8232, 8346, 10058
 Independent events 2556
 Independent loop set (ILS) 8949
 Indirect costs 1082
 Indiscernibility 1790
 Indiscernibility relation 7787
 Individual-based model 114
 Individual-based spatial models 8730

Induced automorphism 8555
 Induced traffic breakdown (induced $F \rightarrow S$ transition) at Bottleneck 9304
 Induction 201, 1826
 Inelastic interaction 8480
 Inertial frame 6426
 Inference, prediction and decision-making; samples and populations 457
 Infinite dimensional control system 4804
 Infinite measure preserving system 3084
 Infinitesimal 6285
 Infinity 6285
 Inflation 1634
 Inflation, cosmological 1642
 Influence 5999
 Information 1948, 7361, 7787
 Information compression, inflation and adaptation 7953
 Information content 4820
 Information economics 6977
 Information exchange 8199
 Information flow 5286
 Information fusion 224
 Information granule 7787
 Information integration 224
 Information measures of statistical memory in complex systems 1616
 Information system 4412, 7729, 7788
 Information systems 1790
 Information theoretical descriptor (information index) 4820
 Information theory 4820, 7729
 Information-based complexity 7119
 Infrasound 4839
 Infrasound array 4839
 Inheritance 132
 Inhibitor 1352
 Initial conditions 5161
 Initial rupture process 2538
 Initial set 4497
 Initial value problem 3256
 Initiating mechanisms 8364
 Injective (reversible) CA 9160
 Injectivity 64, 243, 978
 Inner product 4317
 Innovation 1956, 5377
 Innovator 1956

- Innovators 5377
Input-output map 6371
InSAR 1689
Inspector leadership 4855
Instability 8040, 8927
Instability pockets 6626
Instability tongues 6626
Installed base 1956
Instance 1826
Institutionalist economic models 2285
Integrability 4960, 7164
Integrable 1376
Integrable DS 381
Integrable Hamiltonian systems 5064
Integrable system 1932, 2263, 4515
Integral of motion 382
Integral (of motion) 2263
Intelligence 8869
Intelligent agent 1335
Intelligent agents 7533
Intelligent control 4696, 4869
Intelligent machine 4869
Intelligent query answering 1533
Intelligent transportation system 9471
Intensity, earthquake 2497
Intentionality 4893
Interacting particle system 2712
Interaction 184, 201, 719, 5286
Interaction network 511
Interactive visualization 2347
Intercross 9106
Interdependency 8364
Interface 6459
Interferometric synthetic aperture radar (InSAR) 4250
Intergovernmental coordination group 9592
Intermediate care 4562
Intermittency 8522
Internal model 9078
Internal noise 3361
Internal representation 7533
Internal solitons 8506
Internal stability 1518
Internal versus external influence 8306
Internal wave 8112
Internal waves 6206
International GNSS service (IGS) 4250
Inter-onset time 9831
Interseismic deformation 1689
Interstellar medium (ISM) 381
Inter-story drift 2371
Interval type-2 fuzzy sets 4009
Intrinsic calibration parameters 43
Intrinsic dynamics 8420
Intrinsic effect 8104
Intrinsic noise 8730
Intrinsic uncertainty 4317
Intrinsic universality 901
Intuitive criterion 8126
Invader 4947
Invariance principle 4671
Invariant 866
Invariant group of a tiling 792
Invariant manifold 936
Invariant measure 2981, 4724, 4983, 6939
Invariant set 9225
Invariant tori 5064
Invariant torus 1932
Invasion percolation 6565
Invention 1956
Inverse problem 9631
Inverse problem, inversion 2450
Inverse scattering problem 4960
Inverse scattering transform 4960, 5138
Inverse theory 1689
Invertible system 3084
Ion mobility 5573
Ion trap 7218
Ionosphere 2622, 4250, 8522
IP 4947
IPCC 9014
IPCC emission scenario 7591
Iron law of wages 2285
Irreducible matrix 6239
Irreflexive 8346
Irrelevant parameter 8522
IS 1307
ISAC 1109
Ising model 867, 6380, 6783, 6804, 8709
Ising-type model 149
Island 8246
Isocline 5536
Iso-energetic Poincaré mapping 2263
Isogenic 9106

Isomorphic configurations 5618
 Isostatic 6013
 Isostatic network 2827
 Isotropic 2263
 Isotropic dilation matrix 589
 Isotropy 867
 Iteration 2934
 Iterative array 800
 IUWT 6352

J

JAUS 8438
 Java 132
 Jellium 8576
 Jensen–Shannon divergence 489
 Johnson’s equation 9967
 Joining 5038
 Joining of two measure preserving transformations 4983
 Joint spectrum 7136
 Jointly periodic configuration 9247
 Julia set 3828
 Jump process 8731

K

Kadomtsev–Petviashvili (KP) equation 9968
 Kalman filter 5702
 KAM 5064
 KAM theorem 382
 KAM theory 4516, 6673
 Katabatic wind 8465
k-core 1254
 KdV–Burgers equation 9968
 Kerner’s three-phase traffic theory 9501
 Key distribution problem 7265
 Keynesian 2285
 Kibble mechanism 1642
k-independent-2-paths 8320
 Kinematic GPS 4250
 Kinematic rupture model 4435
 Kinematics 1475
 Kinetic scale 9727
k-in-star 8320
 KKS (Kostant–Kirillov–Souriau) form 5483
 kMC 7931
k-means 5051

k-Means clustering 2348
k-medoid methods 5051
 K-nearest neighbors 1790
k-nearest neighbors 2160
 kNN – *k* nearest neighbors 7071
 Knowledge 1789, 4411, 7533
 Knowledge base 1533, 5536
 Knowledge discovery and data mining (KDDM) 1983

Knowledge discovery (KD) 1983

Knowledge economy 8364
 Knowledge elicitation 4474
 Knowledge representation 1789, 4412
 Knowledge-based system 4869
 Kolmogorov complexity 243
 Kolmogorov group property 8555
 Kolmogorov typicality 953
 Kolmogorov–Arnold–Moser (KAM) invariant surface 6195
 Kolmogorov–Sinai entropy per unit time 989
 Kondo effect 7343, 9644
 Koopman representation of a dynamical system \mathcal{T} 8555
 Korteweg–de Vries equation 5138, 5144, 5161
 Korteweg–de Vries (KdV) equation 9968
k-out-star 8320
 Kramers–Moyal coefficients 3574
 Krein collision 2263
 KS 7931
k-star 8320
k-triangle 8320
 Kurtosis 4114

L

Lévy flight 5218
 Lévy flights 6195
 Lévy stable laws 5219
 Lévy walks 5219
 L_2 spaces 6856
 Labor 2285
 Labor intensive 2285
 Labor productivity 2285
 Lack of information on one side 7630
 Lag 4114
 Laggards 5377
 Lagrange multiplier 5161

Lagrangean submanifold	2263	LERS machine learning/data mining system	7798
Lamb–Dicke regime	7219	Level	5326
Laminar flow	6195	Leveling	1689
Land surface	1	Levels of interoperability	344
Land use transport model	1042	Levels of system specification	344
Landauer–Büttiker formalism	8597	Leverage	9044
Lane formation	3143	LGA	867
Langevin equation	3361, 3575, 8766, 8927	Liapunov exponents	382
Langton’s ant	114	Liapunov–Schmidt reduction	6587
Langton’s loop	114	Lie algebras of vector fields	6761
Laplace equation	9968	Lie group	2003
Laplacian matrix	9211	Lie group action	5483
Large deviations principle (LDP)	7520	Lie groups	5440
Laser cooling	9679	Lie–Poisson structure	2263
Lattice	608, 867, 1395, 3096, 8292	Life	3285
Lattice animals	6545	Life cycle effects	1042
Lattice Boltzmann model	867	Lifting	5841
Lattice gas	867	Lifting step	10007
Lattice property	9656	Ligase	5632
Lattice spacing	867	Lightning	8465
Lattice; unimodular lattice	3029	Likelihood function	2450
Laurent polynomial	10007	Limit cycle	6329
Law	7520	Limit cycle, stable	8927
Law of large numbers (LLN)	7520	Limit order	5392, 5405
Law of requisite variety	8974	Limit set	9160
Lax method	4960	Limit sets	4724
Lazy learning	2160	Lindenmeyer system (L-system)	114
LB	867	Lindstedt series	6663
LbL	7931	Line	8232
LCAO	7931	Line graph	6579
LCR algorithm	7713	Line of optimality	5536
LDA	7931	Linear	5239, 5326
Leader election	7713	Linear CA	978, 2981
Learning (<i>also</i> training) set	5317	Linear cellular automata	64
Learning and teaching	1873	Linear dispersion relation	9968
Learning automaton	4739	Linear dispersive waves	9968
Learning classifier system	4739	Linear dynamical system	8949
Learning classifier system (LCS)	114	Linear logic	5286
Learning for problem-solving and planning	5188	Linear matrix inequality	5702
Learning rule	1813	Linear programming problem	5536
Leath algorithm	6521	Linear Schrödinger equation	9968
Lebesgue space	5450	Linear stability theory	6195
LEM2 algorithm	7797	Linear system	368
Leptokurtosis	3404	Linear systems theory	8949
Leray–Schauder degree	6611	Linear TDMA broadcast	2054
Leray–Schauder–Schaefer fixed point theorem		Linear wave equation in Cartesian coordinates	
	6611		9968

- Linear wave equation in cylindrical polar coordinates 9968
 Linearity in mean 3475
 Linguistic variable 3985
 Linguistic variable, fuzzy conditional statement, com-positional rule of inference 4060
 Link analysis 5266
 Link or arc 9429
 Linkage disequilibrium 3965
 Linkage metric 5051
 Linking number 9269
 Links 2728
 Link-spamming 5266
 Lipschitz norm 7520
 Liquid crystal 295, 3221
 Lithography 5860
 Lithosphere 4179
 Ljusternik–Schnirelmann category 6612
 Local bifurcation 2263
 Local equilibrium 867
 Local field 8588
 Local frequency 8588
 Local intermittency measure, Lim 8522
 Local Lyapunov exponent 3504
 Local maps of a cellular automaton 64
 Local neighborhood 1042
 Local network 8291
 Local properties 936
 Local rigidity 3095
 Local solution 5926
 Local tsunami 2658
 Local vertex invariant (LOVI) 2197
 Locality 8709
 Localization exponent 2253
 Locally stationary process 8669
 Location in a network 6913
 Locked zone 1689
 Lock-in 4631
 Loewner equation 8709
 Loewner evolution 8709
 Logic gate 7361
 Logic programming language 132
 Logical gate 7549
 Logically universal processor 7549
 Logistic growth 1042, 4921
 Lognormal distribution 1042
 Long chain branching 6833
 Long memory 4114
 Long period seismic events 6956
 Long position 5405
 Longevity 3206
 Long-lived player 7651
 Long-period (LP) event 9873
 Long-range power law correlations 3779
 Long-term climate statistics 3
 Long-term correlations 3755
 Long-term prediction with time series 9501
 Lookup table 867
 Lookup table (LUT) 3233
 Loop 6495, 8232
 Loop eigenvalue elasticity analysis (LEEA) 8949
 Loop erased random walk (LERW) 8709
 Lorenz curve, the 2801
 Lorenz equations 6116
 Loss (cost) function 3475
 Low density limit 7807
 Low dimensional semiconductor nanostructures 5912
 Low-dimensional chaos 8522
 Lower and upper solutions 6612
 Lower approximation 7787
 Lower cutoff 6991
 LP 4839
 LSI, large-scale integration circuit 9707
 Lu/Klimas model 8522
 Lyapunov and control-Lyapunov functions 8617
 Lyapunov exponent 2712
 Lyapunov exponents 953, 989, 9247
 Lyapunov function 43, 6272, 9225
 Lyapunov stability theory 4671
 Lymph node 4776
 Lymphocyte 4776
 LYP 7931
- M**
- m^*, c^* 4080
 Machine learning 114, 2160, 4739
 Macro language 132
 Macromolecule 6013
 Macroscopic models 3143
 Macroscopic scale 9727
 Macrostate 4378
 Mafic 9764

- Magma 9764, 9785, 9873
 Magma chamber 6956, 9764
 Magma intrusion 9862
 Magma, melt, liquid 6955
 Magnetic reconfiguration (and/or reconnection) 8522
 Magnetic terms 5483
 Magnetic trap 9679
 Magnetohydrodynamics 8010, 8522
 Magnetohydrodynamics (MHD) 9269
 Magnetosphere 21, 8522
 Magnetotail 8522
 Magnitude 2474, 2658
 Magnitude, earthquake 2497
 Magnitude saturation 9578
 Major histocompatibility 4776
 Majority gate 5860
 Majority relation, strict majority relation 9943
 Majority voting 9933
 Malaria and global warming 1096
 Manakov system 1376
 Manifolds 5440
 Manipulability of a social choice function 9933
 Manipulable mechanism 9656
 Map germ 703
 Mapping 6067
 Marangoni effect 5573
 Marginal costs 1082
 Marginal factor cost 2285
 Marginal link travel time 9430
 Marginal of a probability measure on a product space 5038
 Marginal revenue product 2285
 Marginal stability 7583
 Margolus neighborhood 867
 Market 5359
 Market anomalies 92, 3457
 Market beta 3391
 Market capitalization 3391
 Market economy 2285
 Market efficiency 3435
 Market games 5360
 Market maker 1565
 Market microstructure 9565
 Market model 3449
 Market order 5392, 5405
 Market structure 5392
 Marketing efforts 5377
 Markov chain 2745, 2918, 5860, 5999, 8766
 Markov chain Monte Carlo 6991
 Markov dependence assumption 8320
 Markov intertwining 5038
 Markov model 3457
 Markov operator 8556
 Markov partition 8889
 Markov process 644, 5239, 8380, 8766
 Markov property 8709
 Markov shift 4983
 Markov shift (topological, countable state) 953
 Markov-switching autoregressive model 442
 Markov-switching model 2745, 3475
 Markov-switching models 5326
 Mark-up and mark-down 1565
 Marogram 2658
 Marsupial mechanism 2072
 Marsupial pair 2072
 Marsupial robot 2072
 Marsupial team 2072
 Martingale 3436, 7520
 Martingale process \hat{Z} 5239
 Martingale property 3475
 Marxist economic theory 2285
 Marxist system 2285
 Mask 6856
 Masking epistasis 9106
 Master equation 3361, 5667, 8766
 Matching graphs 6579
 Matching mechanism 9656
 Matching μ 9655
 Mathematica 132
 Mathematical framework 160
 Mathematical model 6789, 9727
 Mathematical modeling 5912
 Mathieu equation 6626
 MATLAB 132
 Maximal spectral type and the multiplicity function of U 8555
 Maximal attractor 9247
 Maximal inequality 2934
 Maximally uninformative (or ignorance) prior 2903
 Maximin preferences 9655
 Maximum entropy formalism 2903
 Maximum entropy measure 953

- Maximum likelihood 9034
 Maxwell count 6014
 MC 7931
 MCMC 1226
 MD 1307, 7931
 Mean ergodic theorem 2934
 Mean field 4902
 Mean field theory 5021, 9411
 Mean shift algorithm 5702
 Mean-Field 7873
 Mean-field approximation 3361, 6772
 Measure 5450
 Measure of maximal entropy 8889
 Measure preserving system 3084
 Measure preserving transformation 4984
 Measure rigidity 3096
 Measure space 2883
 Measure theoretic entropy 4984
 Measurements of traffic flow variables 9500
 Measure-preserving map 2883
 Measure-preserving transformation 2918
 Measures 2981, 8710
 Measure-theoretic entropy 2918, 3040
 Mechanical connection 5483
 Mechanical stability 7026
 Mechanism 4788, 5467
 Mechanism, a 5510
 Mechanisms for power laws 7873
 Median voter theorem 9933
 Mediotype 3206
 Medium 1352
 Mega-thrust earthquake 4250
 Melt 2676, 9764
 Membership function 4869
 Membrane fusion 9749
 Membrane structure 5524
 Meme 114, 3205
 Memeplex (or meme complex) 3205
 Memetics 3205
 Memory 823
 Memory effects in stochastic processes through correlations 1616
 Memory functions 1616
 Memotype 3206
 Mendelian genetics 9106
 Mental model 7052, 7831, 9057
 MEP 1307
 Mere-exposure effect 2242
 Mereology 4413
 Meso theory 8364
 Message passing interface (MPI) 149
 Message passing (MP) 149
 Meta rules 8183
 Metabolic network null space 5536
 Metabolic scaling 2697
 Metabolite 5656
 Metabolome 511
 Metabolomics 1226
 Metacommunity 2697
 Metadata 344, 8084
 Metapopulation 2712
 Metastability 1424, 1538, 4497, 7583
 Meta-stability of man-made structures 2421
 Meter 2310
 Method 132
 Method of moments 3457, 5999
 Methodological individualism 132
 Metric approach 4541
 Metric number theory 3029
 MHD turbulence 8010
 Mh-precisiand 3985
 Microarray 1226
 Microarray hybridization 9106
 Microdynamics 867
 Microfeature 3334
 Microlevel simulation 8375
 Microlite 9764
 Microscopic criterion for traffic phases 9303
 Microscopic models 3143
 Microscopic structure of wide moving jam 9356
 Microscopic swimmers 549
 Microsimulation 1042, 9536
 Microworld 9044
 Mind–body problem 114, 4893
 Minimal energy method 5800
 Minimal self-joinings 5038
 Minimum robust representationalism (MRR) 1109
 Minimum spanning tree 6495
 Minority-carrier transport 9707
 Misfit function 2450
 Missing attribute values 7798
 Mitigation 3110
 Mitochondria 476

- Mixed state 7250
 Mixed strategy 4855
 Mixed-star 8320
 Mixing 3040
 Mixing environment 7520
 Mixing systems 990
 Mixture modeling 457
 Mm-precisiand 3985
 MNDO 7931
 MO 7931
 Mobile agents 132
 Modal analysis 2324
 Modal logic 8333
 Mode 7663, 8040
 2-Mode matrix 8279
 Model 2285, 4392, 6772, 8405
 p_1 Model 8320
 p_2 Model 8320
 Model (*also* classifier) 5317
 Model categories 2
 Model of computation 7119
 Model predictive control 3944
 Model purpose 9000
 Model simplification approach 8949
 Model space 2450
 Model test 2556
 Model testing 2792
 Model validation 1042, 7071
 Model validity 9000
 Model-based automation 344
 Modeler 4474
 Modeling 6565, 8153
 Modeling and simulation ontology 345
 Modeling process 9000
 Model/model system 9000
 Modelocked laser 6117
 Modified Korteweg–de Vries 5144
 Modular design of nucleic acid catalysts 5632
 Modular robot 8050
 Modularity 5692
 Modularity Q 6049
 Modulation matrix 5841
 Module 132, 489
 Molecular automaton 5632
 Molecular barcode 9106
 Molecular chaperons 7026
 Molecular computing 922
 Molecular descriptor 2197
 Molecular descriptors 7422
 Molecular dynamics 6014, 6689, 7026, 9137
 Molecular dynamics method 5668
 Molecular electronics 5860
 Molecular finite state automaton 5632
 Molecular graph 2197, 4820, 9211
 Molecular logic gate 5632
 Molecular Mealy automaton 5632
 Molecular motor 1738
 Molecular species 326
 Molecule 326
 Moment analysis 6991
 Moment magnitude (M_w) 4250
 Moment tensor 2497, 9873, 9900
 Moment-tensor 8154
 Momentum cocycle 5483
 Momentum mapping 2263, 5483
 Monetary valuation 1082
 Monitoring structure 7616
 Monodromy 2263, 7136
 Monodromy matrix 2324
 Monomial 10007
 Monotone cellular automaton 4497
 Monte Carlo 6991
 Monte Carlo Markov chain maximum likelihood estimation (MCMCMLE) 8320
 Monte Carlo (MC) method 689
 Monte Carlo step 5668
 Monte-Carlo 4903
 Monte-Carlo method 8690
 Moore neighborhood 867
 Moore’s law 5860, 7361
 Moral dynamics 5677
 Moral hazard (hidden action) 6977
 Morphogenesis 3779
 Morphological computation 2844
 Morphology 5618
 MOSFET 8576
 MOSFETS 5860
 Motif 489
 Motility 1738
 Movement 848
 Moving blanks within wide moving jam 9356
 Moving jams 9302
 MP 7931
 M-precision 3985

- MRA [6856](#)
 MSRB [1565](#)
 μ -Compatible metric [3084](#)
 Multi-agent based modeling [8365](#)
 Multiagent systems (MAS) [1109](#)
 “Multi-color” network [570](#)
 Multidimensional scaling [2348, 8346](#)
 Multidimensional scaling (MDS) [8279](#)
 Multifractal [3720, 3737](#)
 Multifractal system [3754](#)
 Multifractals [8522](#)
 Multifunctionality [1283](#)
 Multi-granular computing [5736](#)
 Multilayer feedforward artificial neural network
 [2139](#)
 Multiparticle models [867](#)
 Multiple attribute (or multiple criteria) decision
 sup-port [7753](#)
 Multiple equilibria [3](#)
 Multiple instruction multiple data (MIMD) [149](#)
 Multiple network [8291](#)
 Multiple robotic system [2053](#)
 Multiple scales [5912](#)
 Multipliers [1042](#)
 Multipotency [1181](#)
 Multiresolution analysis [8669](#)
 Multiresolution, multiresolution approximation
 (MRA) [5841](#)
 Multi-resolutional clustering analysis [2348](#)
 Multiresolutions [1166](#)
 Multiscale problem [6663](#)
 Multiscaling function, multiwavelet function, multi-
 wavelet [5841](#)
 Multiset [326, 5524](#)
 Multivariate splines [5800](#)
 Mutation [4134](#)
 Mutualistic networks [2711](#)
 Mylonite [657](#)
 Myopic optimum [7651](#)
- N**
- Nanodevice [9749](#)
 Nano-electromechanical systems (NEMS) [689](#)
 NanoHUB [5746](#)
 Nanoparticles [5889](#)
 Nanostructures [5746, 7289](#)
- Nanotechnology [2089, 5912](#)
 NASD [1565](#)
 Nash equilibrium [1587, 4855, 5677, 6639, 7616,
 7651, 8126](#)
 Nash reversion [7651](#)
 National health service (NHS) [4562](#)
 Natural asynchrony [8869](#)
 Natural patterns [3612](#)
 Naturalization [4893](#)
 Navier–Stokes equation [867](#)
 Navier–Stokes equations [548, 9618, 9968](#)
 Navier–Stokes hydrodynamics [4378](#)
n-Body problem [5960](#)
 N-body solver [2348](#)
 NDDO [7931](#)
 NDO [7931](#)
 Nearest neighbor, a [1790](#)
 Near-field [2497](#)
 Nearly integrable system [4516](#)
 Nearly-integrable Hamiltonian systems [5064](#)
 NEB [1307](#)
 Necessity measure [6927](#)
 Negative feedback [4631](#)
 Neighbor [892, 4240, 8232](#)
 Neighborhood [64, 848, 867, 3233, 7154](#)
 Neighborhood system [4324, 4355](#)
 Neighborhood system (local granular model abb.
 local GrC model) [4339](#)
 Nekhoroshev theorem (1977) [5987](#)
 NEMO 3-D [5746](#)
 Neoclassical economic theory [2285](#)
 Neo-classical economics [1082](#)
 Neologism-proof equilibrium [8126](#)
 Nesting [9679](#)
 Net present value [1082](#)
 Net-centric environment [345](#)
 NetLogo [132](#)
 Network [476, 719, 1244, 1254, 2728, 4820, 5999,
 6099, 8232, 8246](#)
 Network analysis [2728](#)
 Network configuration [8320](#)
 Network decomposition [8246](#)
 Network diameter [489](#)
 Network effects [1956](#)
 Network exposure [8306](#)
 Network flows [6407](#)
 Network glass [6014](#)

Network model	8213	Non-equilibrium	8040
Network motif	570, 9106	Non-equilibrium green's function	7480
Network motifs	2712, 5692	Non-equilibrium phase transitions	7874
Network node	719	Nonequilibrium random network	4486
Network or graph	2530	Non-equilibrium systems	1269
Network population	8213	Nonextensive system	2859
Network reconstruction	5536	Non-hierarchical clustering algorithm	2348
Network scaling	1042	Non-homogeneous cellular automaton	3233
Network state	719	Nonindependence	4608
Network threshold	8306	Nonlinear	5239, 5326
Networks	645	Non-linear	2285
Neural complexity	1424	Nonlinear cointegration	2758
Neural correlate of consciousness	1424	Nonlinear dispersion relation	9968
Neural network	5860	Nonlinear dispersive waves	9968
Neural networks	1110, 4869, 6066	Nonlinear impulse response function	3504
Neuro-fuzzy systems	6086	Nonlinear polymer	6833
Neuron	5860, 6099	Nonlinear process	9873
Newman-Ziff algorithm	6521	Nonlinear Schrödinger equation	1376
Newtonian liquid	9764	Non-linear Schrödinger (NLS) equation	9968
Newtonian mechanics	4317	Nonlinear system	4902
Newtonian viscous body	1705	Nonlinear systems	8949
Next-nearest neighbor	8816	Nonlinear time series in macroeconomics	5326
Nilpotent CA	9247	Nonlinear waves	6206
Nilpotent cellular automata	9160	Nonnegative matrix	6239
Nilpotent linear transformation	6649	Nonparametric regression	3475
NIST 4D/RCS	8438	Nonparametric test	6252
NMOS FET	9707	Non-player character (NPC)	1335
No Dictatorship	9933	Non-procedural language	132
Node	8346	Nonsingular dynamical system	3055
Node betweenness (betweenness centrality or load)	6049	Non-smooth dynamical system	6697
Node degree distribution	1244	Non-stationarities	3755
Node degree distribution n_k	7493	Nonsynonymous nucleotide substitution/amino acid replacement substitution	5656
Node indegree (outdegree)	5266	Normal form	6175, 6330, 6709, 8927
Node-betweenness	8910	Normal form game	3176
Node-degree	8910	Normal form on invariant manifolds	6761
Nodes	2728	Normal form procedure	6310
Noise	476, 1983, 6229	Normal form truncation	4516
Noise amplification	3504	Normal frequency	2263
Nomograph	271	Normal linearization	2263
Non revealing strategy	7631	Normal modes	2263, 7219
Nonadditive entropy	2859	Normal state	4378
Non-archimedean	6285	Normal variables	990
Non-coding RNA (ncRNA)	3964	Normalized discounted value	7651
Noncooperative game	4855	Normalizing transformations and convergence	6761
Non-degenerate integrable Hamiltonian system, function	2263	North atlantic Oscillation (NAO)	1071

Notation 2884, 2982, 3084, 3256

Notations 2039

NP-complete 4609, 5860

NPT 7931

NTIP 4947

Nuclear magnetic resonance 6014

Nuclear regulation 9091

Nucleation 4497

Nucleation and probabilistic features of traffic breakdown 9282

Nucleation model for traffic breakdown 9282

Nucleation process 2538

Nucleation zone 2538

Nucleocapsid 9750

Nucleotides and nucleic acids 3284

Nuisance parameters 5326

Nullcline 3334

Numerical methods 7892

Nursing/residential home care 4562

nv 4080

NVE 7931

NVT 7931

NYSE 1565

o

Object 132, 7787

Object closest to a set 1790

Objective function 2450, 5536, 5999, 9034

Objective-C 132

Object-oriented language 132

Observability 3524, 6371

Observation scheme 8213

Observer 132, 6371, 9078

Occupation numbers 867

Ocean waves 9968

Oceans 1

OctArm 1475

ODE 271

Odometry 3682

Off-diagonal self-joinings 5038

Offset 9471

Oligonucleotide 5632

OMC 1307

$O(n)$ models 8710

One mode matrix 8346

One-mode network 8232

One-time pad 7265

On-line random graph 7493

On-line update and batch update 5588

Onset 9831

Onset of congestion 9501

Onset time 9831

On-the-run 9565

Ontogenesys 2844

Ontology 345, 1533, 8084

OP 4947

Open CA 9247

Open reading frame (ORF) 5536

Open system 867

Open/closed loop 3524

OpenGL 2347

Operator 2934, 3334

Operon 417

Opinion dynamics 6380

Opportunity cost 2285

Optical lattice 9679

Optimal algorithm 7119

Optimal control 3944

Optimal path 6495

Optimization 4019, 9034

Optimization algorithms 8869

Optimized direct method 8731

Option 3436

Orbit 3828, 6426, 9225

Orbit of x 2934

Order flow 5392, 5405

Order of a reaction 326

Order parameter 627, 1269, 3361, 5719

Order parameters 8927

Order parameter(s) 3612

Order-driven markets 5405

Ordered and chaotic motion 6427

Ordering 3233

Ordinal properties and monotonicity 4284

Ordinary differential equation 2285, 3256, 8630

Oregonator 7549

Organizational cybernetics 8974

Organizational level 8365

Origin time 2450

Orthogonal ensembles 7505

Orthogonalization 4739

Orthography 2311

Orthologous genes 5656

Orthonormal (ON) 3334
 Oscillator 892, 4240, 7603
 OTC securities 1565
 Outcome 9656
 Outdegree 8232, 8346, 10058
 Outlier 1983
 Outliers 4562
 Out-of-equilibrium 201
 Output elasticity 2285
 Output function 3524
 Overconfidence 5405
 Over-the-counter market 5405
 OWL 8084

P

P, NP, PSPACE, NC 6388
 P system 5524
 PAC 5206
 PageRank 5266
 Pair-correlation function 8576
 Pair-distribution function 8576
 Pairwise majority voting rule 9933
 Palais-Smale condition for a C^1 function $\varphi: X \rightarrow \mathbb{R}$ 6612
 Paleoclimate 3
 Paleoseismology 1689
 Panarchy 4631
 Panel data 2770
 Panic 6476
 Parabolic 2263
 Parabolic scaling law 1719
 Paradox of voting 9933
 Parallel 867, 5860
 Parallel algorithms 7892
 Parallel computation thesis 6388
 Parallel computer architecture 149
 Parallel computing 922
 Parallel Turing machine 741
 Parallelism 5525
 Paralogous genes 5656
 Parameter estimate, a 9831
 Parameter space 4194
 Parameter space and phase space 6992
 Parameters 8320
 Parametric excitation 2323
 Parametric resonance 2323, 6626

Paranemic-crossover DNA 2105
 Pareto distribution, the 2801
 Pareto optimality or pareto efficiency 9933
 Pareto-optimal matching 9656
 Partial algebra 8292
 Partial covering (global granular model; global GrC model) 4340
 Partial dependence assumption 8320
 Partial differential equation 1486
 Partially molten rock 2676
 Particle 768, 3233
 Particle filter 5702
 Particle swarm optimization 114, 2114, 8869
 Particle-hole symmetry 7343
 Particle-wave duality 4317
 Partition 1141, 1254, 2884, 4340
 Partition function of order q 8522
 Partition of a non-empty set X 7788
 Partitioned cellular automaton 7679
 Partitioning 868
 Partitioning networks 6913
 P-a.s. 7521
 Patch 132
 Path 8232, 8346, 9211
 Path dependence 4631
 Path effects 4435
 Path length 8346
 Path planning 6067
 Pathogen 4776
 Pathway 719
 Pathway participation metric 8949
 Pattern 1983, 8926
 Pattern recognition 2348
 Pattern recognition of rare events 3301
 Pattern searching 8246
 Pauli operator 7155
 Payoff 8649, 9034
 Payoff vector 5359
 Payoffs 2215
 PBC 7931
 PDB 9750
 PDE 271
 PDF 2438, 8522
 Peano curve 8710
 Pebble game 6014
 Pedestrian 3142
 Penalized least squares fitting 5800

- Penetration and product life cycle 5377
 Pentagrid 792
 Peptides and amino acids 3284
 Per capita boundedness 5359
 Per capita instantaneous growth rate 2903
 Perceptron 2139, 5860
 Percolation 3737, 3847, 4902, 6783, 6804, 7822, 8710
 Percolation and percolation threshold 6505
 Percolation theory 1395, 6496
 Percolation threshold 1395, 6496, 6565, 6579
 Percolation threshold p_c 3737
 Percolation transition 6538
 Percolative system 1395
 Perfect market 2285
 Perfect monitoring 7651
 Performance index/disutility index 9471
 Period-doubling bifurcation 5299
 Periodic graph 6579
 Periodic orbit 6426
 Periodic orbit, a 6587
 Periodic orbit theory or trace formula 7164
 Periodic tiling 9159
 Periodic tiling problem, the 9160
 Permeability 6565
 Permutation 8346
 Permutative CA 2981
 Permutive CA 9247
 Persistence 3755
 Persistent property 4516
 Personalization of ranking-scores 5266
 Perturbation 6649
 Perturbation expansion 3361
 Perturbation problem 4516
 Perturbation theory 6175, 6310, 6673, 6709
 Perturbations 8365
 PES 1307
 PF 7931
 Pharmacophore 2197
 Phase 9471
 Phase gate 7155
 Phase portrait 368
 Phase shift 8480
 Phase space 2264, 6426
 Phase transition 868, 5719, 6772, 8040, 8365
 Phase transition and criticality 600
 Phase transitions 7874, 8199
 Phase velocity 9968
 Phase-field method 9873
 Phase-flip 7266
 Phase-flip error 7325
 Phenocryst 9764
 Phenomenological field 3335
 Phenomenological theories of the fine structure of turbulence 3642
 Phenotype 114, 9106
 Phenotypic phase plan (PhPP) analysis 5536
 Pheromone 8869
 Philosophy 9057
 Philosophy of science 6789
 Phone 2310
 Phoneme 2310
 Phonology 2310
 Phonon bus 7219
 Phosphodiesterase 5632
 Photon 7250
 Photosphere 9269
 Photosynthesis and carbon fixation 3285
 Phylogenesis 2844
 Phylogenetic depth 489
 Phylogenetics 3965
 Physical gels 6545
 Physical measure 953
 Physical realizability 3335
 "Physically controlled percolation" 1444
 Picking-off risk 5405
 Piezo-electric effect 2621
 Piezoelectricity 5746
 Pinch effect in synchronized flow 9356
 Pinched torus 2264
 Pinning 1126, 2019
 Pitch 5861
 Pitchfork bifurcation 5299
 Pivotal 5326
 Plane convex fractures 6505
 Planned path 5783
 Planning 7953
 Planning knowledge 5188
 Plasma 8465
 Plasma analogy 8576
 Plasma resonance 8522
 Plasmid 417
 Plasticity 1916
 Plate tectonics 1689, 2497

- Platform for agent-based simulation 185
 Platoon 9471
 Player 8649
 Players 2215
 Pleiotropy 9106
 PM3 7931
 P-model 8522
 PMOS FET 9707
 Poincaré map 6426
 Poincaré operator 6612
 Poincaré section 382, 6195
 Poincaré section/map 6587
 Poincaré's disc 792
 Poincaré–Dulac normal form 6761
 Point process 2556
 “Pointedness” 1444
 Pointwise and uniform convergence 3256
 Pointwise ergodic theorem 2934
 Poisson photon distribution 6117
 Poisson reduction 5483
 Poisson space, Poisson bracket, Poisson structure 2264
 Poisson symmetry 2264
 Poisson systems 6587
 Political economy 2285
 Political ignorance 9933
 Polygenic vent 9831
 Polylogarithmic TDMA broadcast 2054
 Polymer 6833
 Polymorphism 133
 Polynomial representation 4739
 Polyphase decomposition, polyphase matrix 5841
 Polyprotein 7026
 Pontryagin Maximum Principle 6271
 Pontryagin Maximum Principle of optimal control 1027
 Pooling equilibrium 8126
 Population coding 3335
 Population density profile 1042
 Population game 3176
 Population network 8213
 Population-based spatial models 8731
 Pore scale 6565
 Porous media 6565
 Portfolio theory 3436
 Pose 43, 4751
 Position 6913
 Positional analysis 6913
 Positional equivalence 8333
 Positive contraction 2934
 Positive definite sequence 3084
 Positive feedback 4631
 Possibilistic logic 6927
 Possibilistic number 4019
 Possibility distribution 6927
 Possibility measure 6927
 Possibility theory 4019
 Posterior distribution 442
 Posterior pdf 2450
 Postmodernism 8365
 Post–Moore’s law computing 3335
 Postseismic deformation 1689
 Potential 1395, 3244
 Potential function 704
 Potentiometer 271
 Potts model 8710
 Power 5326
 Power law 4609
 Power law distribution 3802, 7009, 7493
 Power laws 1042
 Power-law network 570
 PP 7931
 Pragmatic frame 345
 Pragmatics 345
 Pre- and postprocessing 5842
 Precisiand 3985
 Precisiend 3985
 Precision 271, 1983
 Precursory signal 2556
 Predecessor state 64
 Predicate logic 345
 Predictability 3448, 5588
 Prediction 9862
 Prediction of spatiotemporal congested traffic pattern 9501
 Prediction rule 5177
 Preference model 7753
 Preference, preference aggregation 9943
 Preferential attachment 4487
 Preferential attachment rule 2531
 Pregame 5359
 Premonitory patterns 3301
 Premonitory seismicity patterns 4179
 Presentationalism 9057

- Preservation of structure 6310
 Preslip model 2538
 Pressure 6940
 Pre-Topology 4339
 Prevalence 954, 8306
 Prevention 3110
 Price discovery 9565
 Price taking equilibrium 5360
 Price-contingent orders 5405
 Primary care trusts (PCTs) 4562
 Primary dealers 9565
 Primary system 271
 Principal connection 5483
 Principal fiber bundle 2264
 Principal trade 1565
 Principal-agent 6977
 Principle diagonal 8346
 Prior distribution 442
 Prior pdf 2450
 Probabilistic clustering 5051
 Probabilistic graphical model 1226
 Probabilistic seismic hazard analysis 2497
 Probabilistic system 4870
 Probability 7853
 Probability density 2801
 Probability density function – PDF 2396
 Probability density function – pdf 2450
 Probability distribution 3317, 4902
 Probability distribution function 8927
 Probability forecast 2556
 Probability – frequentist and Bayesian 457
 Probability space 2883, 4984
 Probability vector 2883
 Problem solving environment (PSE) 2347
 Procedural language 133
 Process in a measure-preserving dynamical systems 5038
 Processing dynamics 2242
 Processor 5861
 Processor complexity 741
 Product 7831
 Product transformation 2918
 Production factor 2285
 Production level 8365
 Production systems 1110
 Productivity 2285
 Profile 4367, 9943
 Programming language 133
 Progression 9471
 Project 1845
 Projection 3335, 7591
 Projection normalization 43
 Projection operator 4317
 Promise 7119
 Propagation 868
 Proper action 5483
 Proper degeneracy 2264
 Proteasomes 7027
 Protein 6014, 7026
 Protein domain 5656
 Protein engineering 7026
 Protein fold 7026
 Protein folding 7026
 Protein nanomechanics 7027
 Protein unfolding 7027
 Protein-protein interaction 570
 Proteolytic cleavage 9749
 Proteome 511
 Protonation 9750
 Provably convergent cooperative controls 2053
 Pseudo-chaotic systems 990
 Pseudolattice 1395
 Pseudo-likelihood estimation 8320
 Pseudo-spin 8576
 Public policy 7052
 Pulsating stars 382
 Purchasing power parity 2285
 Pure state 7250
 Pure strategy (or simply strategy) 1587
 P-validity 3985
 PW 7931
 Pycnocline 6206
 Pyroclastic flow or surge 9764
 Pyrosequencing 3965
- Q**
- QCA 7931
 q -logarithmic and q -exponential functions 2859
 QMA complexity class 7155
 QO 7422
 QOS 7423
 QQSPR 7423
 QS 7423

- QS matrix 7423
 QSAC 7423
 QSAR & QSTR 7423
 QSAR modeling workflow 7071
 QSAR – quantitative structure activity relationships 7071
 QSPR 7423
 Quadratic return variation 8783
 Qualitative system dynamics 4562
 Quantitative structure-activity relationship (QSAR) 2197
 Quantitative structure-activity relationships 2114, 2140, 2160
 Quantitative structure-property relationship (QSPR) 2197
 Quantitative structure-toxicity relationship (QSTR) 2197
 Quantitative trait locus (QTL) 9106
 Quantum algorithm 7361
 Quantum bifurcation 7136
 Quantum bit 7361
 Quantum channel 7325
 Quantum circuit 7174
 Quantum circuit model 7088
 Quantum circuits 7325
 Quantum classical correspondence 8927
 Quantum communication channel 7362
 Quantum communications 7201
 Quantum complexity class 7174
 Quantum computation 7250
 Quantum computer 7362, 9128
 Quantum computing 7201
 Quantum computing speedup 7119
 Quantum correction 7401
 Quantum cryptography 7362
 Quantum dense coding 7201
 Quantum dot 9644
 Quantum dot cellular automaton 5861
 Quantum dot device 7342
 Quantum dot (QD) 7309
 Quantum dots 5746
 Quantum dots (QDs) 7289
 Quantum entanglement 1011
 Quantum error-correcting code 7362
 Quantum error-correcting code (QECC) 7325
 Quantum gate 1011, 7325
 Quantum impurity system 7343
 Quantum information 7362
 Quantum interactive proof system 7174
 Quantum interference 4194
 Quantum key distribution 7201, 7265
 Quantum Loschmidt echo or fidelity 7164
 Quantum Mechanics 3859
 Quantum mechanics 7362
 Quantum network 7219
 Quantum phase transition 7136, 7343
 Quantum proof 7174
 Quantum register 7219
 Quantum setting 7119
 Quantum similarity matrices (QS matrices) 7423
 Quantum similarity measures (QSM) and indices (QSI) 7423
 Quantum state 4317
 Quantum statistical mechanics 5668
 Quantum sub-band 7401
 Quantum teleportation 7201, 7250
 Quantum transport in semi-conductor devices 7480
 Quantum tunneling 9644
 Quantum Turing machine 7155
 Quantum weirdness 7362
 Quantum wire 1012
 Quantum-classical correspondence 7136
 Quantum-Monte Carlo (QMC) 8576
 (Quasi) Ergodic hypothesis 3040
 Quasi integrable Hamiltonian 5987
 Quasi-attractor 9247
 Quasi-integrable system 1932
 Quasilinear models 8949
 Quasi-periodic 2264, 6626
 Quasiperiodic behavior 8949
 Quasi-periodic motion 1932
 Quasi-periodic motions 5064
 Qubit 7155, 7201, 7219, 7250, 7266, 7325, 7361
 Qubit complexity 7119
 Qubit (or quantum bit) 1011
 Qubus 7201
 Quenched constraints 294
 Quenched law 7521
 Query 7119
 Query complexity 7089, 7119
 Queue 6521
 Quota of an agent 9654
 Quote-driven markets 5406

- Quotient set 5736, 7788
 Quotient space 5736
 Quotient space model 5736
 Quotient structure 4339
- R**
- Rabi-oscillations 7219
 Radial basis function network 2140
 Radial basis function (RBF) 3335
 Radial distribution function 3779
 Radiated or seismic energy 2581
 Radiative transfer theory 7914
 Ramified torus bundle 2264
 Ramp-up preparations 3110
 Random dynamics approximation 8816
 Random field 3475
 Random graph 6495, 7493
 Random graph model $\mathcal{G}(\mathbf{w})$ 7493
 Random homogeneous mixing 4660
 Random manifold 2019
 Random matrices 7505
 Random matrix theory 7164
 Random media 7914
 Random network 4486
 Random networks 608
 Random number generator (RNG) 5668
 Random recursive graph (tree) 4487
 Random resistor network 3737
 Random sets 8679
 Random system 368
 Random variable 489, 3317
 Random void and the inverted random void systems, the 1444
 Random walk 868, 1395, 8380, 8710
 Random-graph network 8910
 Randomized network 10059
 Randomized setting 7119
 Random-phase approximation (RPA) 8576
 Rank size rule 1042
 Ranking 5349
 Rank-ordered multifractal analysis, ROMA 8522
 Rapture 5746
 Rashba- and Dresselhaus spin-orbit coupling 8597
 Ratchet 5861
 Ratchets 8597
 Rate 8306
- Rate function 5999
 Rational agents 7533
 Rational choice 8183
 Rational expectations 4972
 Rational expectations (RE) 3374
 Rational function, rational map 4984
 Ray path 2450
 Rayleigh number 6195
 Rayleigh–Bénard convection 6195
 RDF 8085
 RDF(S) 8085
 Reachable 8232
 Reaction channel 8731
 Reaction kinetics 7565
 Reaction network 326
 Reaction rate equation (RRE) 8731
 Reaction-diffusion 1042
 Reaction-diffusion equation 8731
 Reaction-diffusion master equation (RDME) 8731
 Reaction-diffusion mechanism 525
 Reaction-diffusion system 114, 6195
 Reaction-diffusion systems 868, 4921
 Real option 7831
 Realization 6371
 Realized volatility 4114, 8783
 Reasoning 1789, 4413
 Recall 1983
 Receiver 8126
 Receiver or station 2450
 Receptive field 3335
 Receptor 2197
 Recession 3301
 Reciprocal-hemizygote 9106
 Recombination 4161
 Reconfiguration algorithm 5618
 Reconnection 9269
 Record 133, 7583
 Recorder 4474
 Rectified diffusion and rectified heat transfer 6956
 Recurrence 3040, 9225
 Recurrent random walk 1396
 Recurring and non-recurring congestion 9501
 Recursion 6521
 Recursive and recursively enumerable (re) 9160
 Recursive network 4487
 Recursively generated object 114

Reduced form models	5552	Renormalization group (RG)	5021
Reduced phase space	2264	Renormalization group theory	7874
Reduction of network	8246	Repast	133
Reduction principle	937	Repast simphony	133
Reduction process	1775	Repast simphony score	133
Reductionism	4562	Repeated game	7616, 7651
Redundant bond	2827	Repeated game with incomplete information	7630
Redundant edge	6014	Repeated games	4098, 5177
Reference architecture (RA)	8438	Repeater	5861
Reference frame	4250, 6426	Repellor	9225
Reference Mode	9044	Replication	3894
Reference mode	4474	Replicator	3205
Reference mode of behavior	4562	Replicator dynamic	3176
Refinable function vector, refinement equation	5842	Replicator dynamics	5678
Reflection	133	Repose	9831
Refraction and inverse refraction diagrams (travel timemap)	9632	Representations	6723
Refractory period	1353	Representative agent	92
Regime shifts	3	Reputation bound	7651
Regime-Switching Model	2745	Requisite complexity	8365
Regional tsunami	2658	Requisite variety	8365
Regression	1983	R-Equivalence	703
Regular domain	3233	Resilience	4631, 8040
Regular equivalence	8279, 8333	Resistor networks	6546
Regular lattice	608	Resonance	21, 2265, 4516
Regular solution	5926	Resonance vs. Non-Resonance	6709
Regularity	978	Resonant clock	5861
Regulatory network	9091	Resonant eigenvalues	6761
Relation	8346	Resonant frequencies of vibration	2371
Relational data model (RDM)	4305	Resonant interaction	8480
Relational granulation	8333	Resonant or critical phenomenon	9968
Relational structure (relational granular model; relational GrC model)	4340	Resonant tunneling device	5861
Relative equilibrium	2264	Response function	8522
Relative periodic orbit	6587	Responsive preference	9655
Relativity	3859	Restricted totalistic rules	8816
Relaxation	8691	Restriction	8710
Relaxation oscillation	6117, 7603	Retain	1791
Relaxation time spectrum	6546	Retrieve	1791
Relevant and irrelevant nodes	600	Retrovirus	9749
Relevant parameter	8522	Return	3404
Rematching proof equilibrium	9656	Reuse	1791
Remove the degeneracy	2265	Revelation game	9656
Renormalization	1396, 7822	Revelation mechanism	9656
Renormalization group	1932, 6663	Reverse auction	2072
Renormalization group analysis	1269	Reverse field pinch	8010

- Reversible logic 7362
 Reversible logic element 7696
 Reversible system 5299
 Reversible Turing machine 7696
 Revise 1791
 Revision protocol 3176
 Revisionist economic models 2285
 Reynolds number 549, 5573, 6195
 $r(f)$ -Separable preference 9655
 Rheology 9785
 Rich configuration 243
 Riemann's mapping theorem 8710
 Riemannian manifolds 5440
 Rigid region decomposition 6014
 Rigidity percolation 6546
 Rigidity percolation threshold 2827
 Rings 778
 Rise time 4435
 Risk treatment options 3110
 Riskless principal trade 1565
 RNA 417, 2090, 3598
 RNA interference (RNAi) 3965, 9106
 Road network 9727
 Road pricing 9430
 Road problem 8889
 Robot 1475, 3683, 4644, 6066
 Robust identification 5702
 Role algebra 8292
 Rossby solitons 8506
 Rotary element 7696
 Rotations on \mathbb{T} 3084
 Rough inclusion 1790, 4413
 Rough set 4284, 4324, 7753, 7788, 8333
 Rough set theory 4355
 Rough sets 7729
 Rough sets: knowledge as classification 4412
 Route or path 9429
 RSA 7931
 RTTRS (or TRS) 1566
 Rule 892, 4240
 Rule induction 7798
 Rule table 64
 Rules 848
 Rules and RIF 8085
 Run-length limited shift 8889
 Runtime type identification 133
 Run-up height 9578
 Runup, or runup height 9618
 Rupture 4250
 Rupture duration 4436
 Rupture velocity 4436
- S**
- SA 7931
 SAD 3457
 Saddle 2265, 5377
 Saddle point 4855
 Saddle-node bifurcation 5299
 SAM 7931
 Sample complexity 5206
 Sampling 1983
 Sampling design 8213
 Sampling frame 8213
 SAR 4644
 Satellite laser ranging (SLR) 4250
 Satisfiability (SAT) 2090
 Saturation 2474
 Saturation flow 9471
 Scalability 1141
 Scalable 7201
 Scale free 476
 Scale free network 6495, 6639
 Scale invariance 8710
 Scale invariant process 7583
 Scale invariants 8522
 Scale of observation/representation 9727
 Scale-free model 6049
 Scale-free network 570, 3924, 4608, 5692, 6048, 8910
 Scale-free networks 234, 1042, 2711, 4487
 Scaling 271, 476, 1126, 1642, 2019, 9785
 Scaling hypothesis 868
 Scaling law 868, 3754
 Scaling limit 8710
 Scaling limits 7807
 Scaling methods 8265
 Scanning tunneling microscope (STM) 689, 5861
 Scattering 7401, 7663
 Scattering coefficient g 7914
 Scattering data 4960
 Scenario 7831
 Scenario-driven planning (abbreviated SdP) 7831
 SCF 7931

Schauder fixed point theorem	6612	Seismogenic	1689
Schelling model	6380	Seismogram	2450, 2498
Schema	345	Seismograph	2498
Schrödinger equation	6724	Seismometer	2498
Schrödinger picture	7155	Selection	4134, 5999
Schrödinger picture of quantum mechanics	8927	Self- and cross-phase modulation	1376
Schrödinger representation	6724	Self healing	1283
Schrödinger's cat	7362	Self organization	7953
Schramm's theorem	8710	Self-affine system	3754
Scientific visualization	2347	Self-assembly method	5889
SCS property	8555	Self-avoiding random walk (SAW)	8710
SDCA model hierarchy	8816	Self-employment	2285
Seafloor geodesy	8851	Self-exciting threshold models	5326
Search	5349	Self-joining	5038
SEC	1566	Self-maintaining	326
Second generation discrete curvelet transform (DCTG2)	1719	Self-organization	114, 1537, 6476, 8198, 8420, 8926
Second law of thermodynamics	7362, 9127	Self-organized criticality	868, 3779, 7009, 7853, 8028, 8040
2nd Postulate of quantum mechanics	4317	Self-organized criticality (SOC)	644, 7874, 8522
Secondary market	9565	Self-organized dynamics	9411
Second-order cybernetics	1110	Self-organizing map	2140
Section	1244	Self-reconfigurable robot	8051
Sector	2285	Self-replication	114, 8051, 8066
Secular part of dipole-dipole interactions	8588	Self-reproduction	8067
Segregation model	1042	Self-signaling set	8126
Seismic body waves	2658	Semantics	345, 1533, 4392
Seismic cycle	1689	Semi-algorithm	9160
Seismic data-logger	2396	Semiclassical limit	6748
Seismic energy	2474	Semiclassical theory	8104
Seismic hazard	2396, 2497, 7853	Semiconecave and semiconvex functions	4541
Seismic hazard analysis	2497	Semicycle	8232
Seismic hazard map	2497	Semi-decidability	755, 9160
Seismic magnitude	9578	Semigroup	8292
Seismic moment	2498, 2538, 2581, 2658, 5021, 9578	Semi-local bifurcation	2265
Seismic moment M_o	2474	Semipath	8232
Seismic phase	2450	Semi-supervised learning	5349
Seismic potency	5021	Sender	8126
Seismic radiation	2581	Sensation seeking	3457
Seismic risk	2498	Sensitive CA	2232, 9161
Seismic sensors	2396	Sensitivity analysis	5536
Seismic spectrum	2581	Sensitivity on initial conditions	954
Seismic surface waves	2658	Sensitivity (recall)	1983
Seismic tomographic image	2676	Sensitivity to initial conditions	243, 978
Seismic wave	2498	Sensor	345
Seismic waves	2658	Sensors	1475
Seismicity	2450	Separating equilibrium	8126

- Separatrices 4516
 Sequential equilibrium 1587, 7616
 Serial dependence 6252
 Serial offering 1566
 Service oriented architecture (SOA) 8439
 Service-oriented architecture 345
 Settlement 5406
 Sexually transmitted infection 4660
 SFF-LSE 4080
 SFF-SVM 4080
 Shadow price 5536
 Shallow and deep water waves 8506
 Shallow earthquake 2658
 Shallow water 6206, 8112, 8465
 Shallow water (long) waves 9631
 Shallow water wave equations 8112, 9618
 Shallow water waves 8112
 Shape memory 295
 Shape space 5483
 Shapley value 1509, 5359
 Sharpness 5326
 Shear deformation 4997
 Shell models 8010
 Shift equivalence 8889
 Shift of finite type 8889
 Shift space 8889
 Shilnikov scenario 382
 Shock 21, 4713
 Shor's algorithm 7250
 Short memory 2758
 Short position 5406
 Shortest independent loop set (SILS) 8949
 Shortest path 6495
 Shortest path (geodesic path) 6049
 Shortest-path problem 7549
 Short-lived player 7651
 Short-term correlations 3755
 Short-term prediction with time series 9501
 Shot noise 6117
 Shrinkage 8669
 Sieves 3475
 σ -Algebra 4047
 Signal 800
 Signal subshift 9247
 Signaling game 8126
 Signaling pathway 9091
 Signed graph 8232
 Silicic 9764
 Silicon nanowire field effect transistors 7480
 Similarity 1791, 4412
 Simple action type 7651
 Simple graph 8232
 Simple graph or network 6048
 Simple mechanical system 2265
 Simple random graphs, Bernoulli graphs, Erdős–Rényi graphs 8320
 Simple sampling 5668
 2d-Simplex 7521
 Simplex of probabilities over a finite set, the 7631
 Simplicity 5038
 Simulated method of moments 3457
 Simulation 1042, 5467, 6565, 8405, 9044
 Simulation point 9592
 Sinai–Ruelle–Bowen measure 6940
 Sinai–Ruelle–Bowen measures 954
 Sinai–Ruelle–Bowen (SRB) measure 990, 8168
 Sincere strategy 9656
 Single electron transistor 7309
 Single electron tunneling device 5861
 Single instruction multiple data (SIMD) 149
 Single molecule experiments (SME) 3597
 Single nucleotide polymorphism (SNP) 5536
 Single photon detector 7265
 Single photon source 7265
 “Single-color” network 570
 Single-crossing condition 8126
 Single-electron circuit 9707
 Single-molecule force spectroscopy (SMFS) 7027
 Single-transient models 8949
 Singular perturbations 7603
 Singular reduction 2265, 5483
 Singular value decomposition 8346
 Singularity 703
 Singularity spectrum $f(\alpha)$ 8522
 Singularity theory 4516
 Singwi–Tosi–Land–Sjölander (STLS) 8576
 Sinusoidal (or exponential) wave 9968
 SIR 4644
 SIRN (synergetic inter-representation network) 7953
 Site 868
 Site effects 4436
 Site percolation 1443, 6538, 6579
 Situated agent 2844

Situation	7831	Social force	6476
Size	5326	Social mechanism	8365
Size quantization	7401	Social network	6913, 8213, 8291, 8333
$S(k)$	6810	Social network analysis (SNA)	114
Skeleton	7549	Social network (or, in graph theory, a graph)	8279
Skewness	4114	Social networking community	4367
Skin effect	2622	Social physics	1042
Slaving principle	3612, 8927	Social process	8405
Sliding block code	8889	Social services	4562
“Slime trail motion”	913	Social-cognitive systems	8183
Slip	4250	Socialization	8183
Slip distribution	4436	Socio-cultural evolution	8183
Slip velocity	2538	Sociometry	8346
Slippage	5406	Sociophysics	6381
Slip-velocity function (Slip-rate function)	4436	Sociotype	3206
Slow dynamics	1042	Sofic shift	8889
Slow earthquake	8851	Soft computing	4696, 4870
Small divisors/denominators	5064	Software engineering	4356
Small group effectiveness	5359	Soil organic carbon	1071
Small-world models	8265	Soil–structure interaction	2421
Small-world network	570, 3924, 6049, 6639, 8910	Soil–structure interaction (SSI)	2371
Small-world networks	1424	Sol	6546
Small-worlds graph	1244	Solar constant and albedo	3285
Smooth flow	4723	Solar corona	22, 8010
Smooth transition models	3476	Solar flare	22
Smooth transition threshold model	2745	Solar wind	8010, 8522
Smoothed probability of a regime	2745	Solenoid	2265
SMP-1 environmental scanning	7831	Solidification	4497
SMP-2 mission	7831	Solitary wave	1376, 8112, 8465, 8479
SMP-3 objectives	7831	Solitary waves	6206
SMP-4 policy	7831	Solitary waves (or soliton)	9968
SMP-5 strategy	7831	Soliton	1376, 4960, 5138, 5144, 6117, 8112, 8453, 8457, 8465, 8479, 8506
SMP-6 strategy design or formulation	7831	Soliton (colloquially as well as in certain domains)	8479
SMP-7 strategic action or implementation	7831	Soliton perturbation theory	8453
SMP-8 evaluation and control	7831	Soliton solution	8479
SMP-9 learning through feedback	7831	Solitons	80, 5091, 5161, 6206
Sobolev inequality	6612	Solution concept	1509
Sobolev space	6709	Solution space	5536
Sobolev spaces	2039	Somatic evolution	913
Social agent-based modeling	114	Source	2450, 6388
Social choice function	9933	Source effects	4436
Social choice function, a	5510	Source entropy	489
Social choice function, social choice correspondence	9943	Source mechanism	2474
Social choice rule	4788	Source parameters of an earthquake	2498
Social circuit dependence	8320	Source (sink) SCC	5266
Social contract	5678		

- Soybean cyst nematode 1071
 Space complexity 741
 Space domain 1486
 Space plasma 8522
 Space-homogeneous 7154
 Spaces between 8365
 Spacetime 3858
 SPARQL 8085
 Sparsity 8669
 Spatial chemical Langevin equation 8731
 Spatial coordinate (vector x) 8927
 Spatial interaction 1042
 Spatial light modulator (SLM) 6388
 Spatially extended systems 868
 Spatiotemporal congested traffic pattern 9500
 Special flow 8555
 Species abundance 2903
 Species richness 2903
 Species strength 2712
 Specificity 1983
 Spectral clustering 5052
 Spectral decomposition of a unitary representation 8554
 Spectral density of states 3879
 Spectral dimension 310, 3879
 Spectral disjointness 8555
 Spectral elements 7892
 Spectral (or fracton) dimension 2253
 Spectrum 8927
 Spence-Mirrlees condition 8126
 Spike, autowave 1353
 Spiking neural P system 5525
 Spillway 8465
 Spin 868
 Spin blockade 7309
 Spin dynamics 8588
 Spinodal decomposition 7874
 Spin-orbit interaction 8104
 Spin-orbit problem 6673
 Spintronic device 5861
 Spintronics 689, 8597
 Splicing 4161
 Split selection 1827
 Spontaneous symmetry breaking 7136
 Spontaneous traffic breakdown (spontaneous F → S transition) at bottleneck 9304
 Spontaneous wide moving jam emergence in synchronized flow 9304
 Sporulation 9106
 Spot market 5406
 Spreading set 2232, 9247
 Spring embedder 1254, 8346
 Squeezing 7201
 SRO 1566
 Stability 5065, 6426, 8199, 8616
 Stability of a system 8927
 Stability theory 8630
 Stabilizability 3524
 Stabilization 8616
 Stabilizer code 7325
 Stable manifold 990
 Stable matching mechanism 9656
 Stable North America 4250
 Stable outcome 9656
 Stack 6521
 Stackelberg action 7651
 Stackelberg type 7651
 Stage game 7651
 Stakeholder 7052
 Standard signaling game 8126
 Star-network 8232
 Start of the homicide surge (SHS) 3301
 State change complexity 741
 State equation 1486
 State of a system 4902
 State of nature 426
 State of the world 426, 4788
 State space 1181
 State splitting 8889
 State transition diagram 64
 State variables 1485
 State vector 8926
 States and observables 6723
 Static stress change 2600
 Static stress drop 2581, 4436
 Static traffic assignment 9430
 Station 2450
 Stationary distribution and transient 6992
 Stationary pattern 6459
 Stationary process 2934, 7583, 8669
 Stationary system 368
 Statistical inference network 511
 Statistical mechanics 1269, 4378

- Statistical physics 7874
 Statistical stability 954
 Steady state 9078
 Steady states of traffic flow 9303
 Steady Stokes equations 549
 Steady-State flow 5925
 Steady-state spin current 8104
 Steady-state spin density 8104
 Steepness 5326
 Stellar systems 8691
 Stem cell 1181
 Stigmergy 114, 8869
 STM 1307, 7931
 Stochastic 2556
 Stochastic differential and difference equations 8750
 Stochastic discrete model 554
 Stochastic dynamical system 6229
 Stochastic dynamical systems 8750
 Stochastic dynamics (SD) method 689
 Stochastic game, a 8698
 Stochastic Loewner evolution (SLE) 6521, 8710
 Stochastic process 2556, 4984, 5451, 8380, 8766
 Stochastic process in scale 3575
 Stochastic simulation algorithm (SSA) 8731
 Stochastic stability 954
 Stochastic variable 8766
 Stochastic volatility 8783
 Stochastically stable state 3176
 Stock 4577, 8990, 9043
 Stock return 3448
 Stoichiometric matrix (v) 8731
 Stokes approximation 5573
 Stokes expansion 9968
 Stokes lines 6748
 Stokes wave 9968
 Stone–Wales transformation 9138
 Stop-loss orders 5406
 Strain 5746
 Strainmeter 4250
 Strange kinetics 5219
 Strategic abstention 9933
 Strategic complexity 4098
 Strategic form game 1518
 Strategic game 1660
 Strategic level 8365
 Strategic management process (abbreviated SMP) 7831
 Strategic (or normal) form game 1587
 Strategic voting 9933
 Strategies 1948, 2215
 Strategy 4098
 Strategy, a 8698
 Strategy of a player 7630
 Strategy profile 7630
 Stratification 2265, 6195
 Stress drop (static stress drop) 2538
 Stretched-exponential distribution 7009
 Strike slip fault 5021
 Strombolian activity 8153
 Strong component 8232
 Strong motion seismograph 4250
 Strong shift equivalence 8890
 Strong transitivity 978
 Strong turbulence 6195
 Strongly connected 8232
 Strongly connected component 10059
 Strongly connected component (SCC) 5266
 Strongly connected digraph 6239
 Strongly substitutable preferences 9655
 Structural change 5326
 Structural descriptor 2114, 2140, 2160
 Structural equivalence 8279, 8333
 Structural field 3335
 Structural health monitoring 2371
 Structural model 5552
 Structural property 8232
 Structural stability 954
 Structurally dynamic cellular automata 8816
 Structurally stable 4516
 Structure 345
 Structure contribution approach 8949
 Structure function of order q 8522
 Structure–activity relationships 2140
 Structure–activity relationships 2114, 2161
 Structured language 133
 Subbands 8576
 Subdiffusion 6195
 Subduction 1689
 Subduction zone earthquake cycle 10047
 Subeconomy 2285
 Subexcitability 1353
 Subexcitable medium 7549

- Subgame 7651
 Subgame perfect equilibrium 7651
 Subgraph 4820, 5692, 9211
 Submarine landslide 8851
 Subshift attractor 9247
 Subshift of finite type 954
 Subshift, shift space 5451
 Subshifts 2981
 Substitutable preferences 9655
 Sufficient statistic 4608
 Sugarscape 114
 Sum resonance 6626
 Sumatra-Andaman earthquake 2348
 S-Unit theorems 3040
 Supercooled liquid 4997
 Superdiffusion 6195
 Superintegrable system 2265
 Superposition 7362
 Superposition of states 5861
 Superstrings, cosmic 1642
 Supervised learning 5349
 Supervisor of hybrid controllers 4671
 Support vector machines 2160
 Suprafault 657
 Surface acoustic wave (SAW) 1012
 Surface gravity waves 9968
 Surface reaction center 1307
 Surface site 1307
 Surface wave 8113
 Surface waves 2498
 Surface-capillary gravity waves 9968
 Surjective cellular automata 9160
 Surjectivity 64, 243, 755, 978
 Survey sampling 8213
 Swap operation 7155
 Swaps 5406
 Swarm 114, 133
 Swarm behavior 8365
 Swarm Intelligence 8869
 Swarm intelligence 114, 3683
 Swarm optimization 8869
 Swarm Robotics 8869
 Swift–Hohenberg equation 3612
 Swimming 548
 Swimming microrobots 549
 Symbol 5842
 Symbolic processing 114
 Symmetric 8346
 Symmetric and asymmetric phase 5588
 Symmetry 6175, 8927
 Symmetry breaking 7136
 Symmetry reduction 6175, 6310
 Symplectic 2003
 Symplectic ensembles 7505
 Symplectic form 2265
 Symplectic manifold 2265
 Symplectic reduction 5483
 Symplectic structure 5065
 Sympport/antiport 5525
 Synapse 3335, 5861, 6099
 Synchronization 627, 3233, 8910, 9471
 Synchronized flow patterns 9356
 Synchronized flow traffic phase 9303
 Synchronous 848
 Syndetic set 3084
 Synergetics 8926
 Synergies 1537
 Synonymous nucleotide substitution/amino acid re-placement substitution 5656
 Synoptic scale 8465
 Syntax 345, 4392
 Synthetic O-D estimation 9430
 Synthetic sickness or lethality (SSL) 9106
 System 4562, 7831, 8405, 8974
 System behavior 4562
 System dynamics 2285, 4562, 7052, 8365, 8967, 8974
 System dynamics (abbreviated SD) 7831
 System entity structure 345
 System optimum traffic assignment 9430
 System specification 345
 System structure 4562
 System theory 8974
 Systematic risk 3436
 Systems approach 8974
 Systems biology 1226
 Systems thinking 4562, 9044
 Syzygy 2265

T

- T Cell 4776
 Tagged set 7423
 Tail 3404

- Tail index 3404
 Take-profit orders 5406
 Tangent and cotangent spaces 5440
 Target system 4194, 6790
 Tau-leaping method 8731
 Taylor hypothesis 8522
 Taylor–Couette flow 6195
 TB 7931
 Technical Trading 5406
 Tectonics 2498
 Tele-Operation 4644
 Tele-operation 3683
 Teleportation 7362
 Teleseism 2498
 Teleseismic 4251
 Teletsunami 2658
 Telluric current 2621
 Templates 133
 Temporal regularization 4671
 Ternary heptagrid 792
 Tessellation 792
 Test function 6330
 Testing object 1827
 Testing set 1827, 5317
 Thalamocortical system 1424
 Theories of value 2285
 Theory of neuronal group selection (TNGS) 1424
 Thermal stability 8691
 Thermal stress and mortality 1095
 Thermocapillary effect 5573
 Thermocline 8465
 Thermodynamic variables 5668
 Thermodynamics 3268, 9127
 Thermohaline circulation 3
 3rd Postulate of quantum mechanics 4317
 Three traffic phases 9356
 Three-body problem 6673
 Three-dimensional (or 3D) flow 5925
 Three-phase traffic theory 9303
 Threshold autoregressive model 442
 Threshold model 2745, 3476
 Threshold result 7201
 Threshold theorem 7325
 Thresholding 8669
 Thunder 8465
 Thunderstorm 8465
 Tidal bore 8465
 Tie indicator 5999
 Tierra 114
 Tight binding 5746
 Tight wavelet frame 5800
 Tight-binding method 9137
 Tight-binding molecular dynamics 9137
 Tiles 9159
 Tiling 792, 9159
 Tiling $\{p, q\}$ 792
 Tiling microarray 3964
 Tiling problem, the 9160
 Tiling problem with a seed tile, the 9160
 Time complexity 741
 Time complexity of algorithm 8246
 Time division multiple access (TDMA) 2054
 Time evolution of the scattering data 4961
 Time reversibility 5326
 Time series 3754, 5326, 6252
 Time series of traffic variables 9501
 Time step 868
 Time-dependent traffic assignment 9430
 Time-homogeneous 7154
 Time-space diagram 3538
 Time-varying transition probability 2745
 TIP 4947
 Tissue P system 5525
 Titin 9750
 TM 271, 1307
 T-map 9655
 Toeplitz space 2232
 Tomography 7250
 Top level domain 10059
 Top-down administration 8365
 Top-down fabrication 5861
 Topological complexity 9211
 Topological conjugacy 8890
 Topological entropy 3040, 8890, 9161
 Topological genericity 954
 Topological index (TI) 2197
 Topological mixing 978
 Topological neighborhood system 4339
 Topological sort 8246
 Topology 2728
 Torus 1932
 Total adjacency of a graph 4820
 Total costs 1082
 Totally balanced game 5359

- TRACE (formerly NASD TRACE) 1566
 Trace velocity 4839
 Trading volume 5406
 Traffic assignment 9429
 Traffic breakdown 9282, 9302
 Traffic congestion at heavy bottleneck 9356
 Traffic flow management 234
 Traffic flow model 9303
 Traffic loading 9430
 Traffic routing 9429
 Traffic stream motion model 9430
 Training object 1827
 Training set 1827
 Trajectory 1486, 4902, 8927
 Trajectory or path 3597
 Tranformity 2697
 Transcript 4161
 Transcription 417, 3894
 Transcription factor 1180
 Transcriptome 511, 1181
 Transfer function 2475, 3335
 Transfer matrix 5702
 Transfer principle 6285
 Transformability 4631
 Transient random walk 1396
 Transient states 64
 Transition function 3234
 Transition probability 2745, 5668
 Transitive triad 8320
 Transitivity 243, 978, 9225
 Translation 417
 Transmission probability 7663
 Transmission resonance 7663
 Transport coefficients 990
 Transversal gates 7325
 Travel demand 9536
 Travel time 2450
 Treatment effects 5552
 Tree 1932, 4487, 6495, 6521, 6833, 8346, 9211
 Tremor 4839
 Triad 8232
 Triangle 8320
 Triangular arbitrage 5406
 Triangulation 1689
 Trilateration 1690
 Trip distribution 1042
 Triples and triplestores 8085
 Trophic cascades 2712
 Trophic species (S) 3661
 Troposphere 4251, 8465
 Truncation 9656
 TS 1307
 TS-FR 4080
 Tsunami 2658, 8113, 8465, 8506
 Tsunami amplitude 9592
 Tsunami early warning system 9592
 Tsunami earthquake 2658, 9578
 Tsunami inundation 9618
 Tsunami magnitude 9578
 Tsunami warning system 2658
 Tuning parameters 5021
 Tunnel effect 6748
 Tunneling 5861, 7201, 7343
 Tunneling percolation 1444
 Tunneling phase logic 5861
 Turbulence 7874, 8140, 8522
 Turbulence modeling and large eddy simulations 3642
 Turbulent cascades 3642
 Turing equivalent 1376
 Turing machine 489, 800, 5861, 9127
 Turing machine (TM) 9159
 Turing patterns 3612
 Turtle 133
 Twist number 9269
 Two mode matrix 8346
 2004 Indian Ocean tsunami, the 9631
 Two-dimensional electron gas (2DEG) 1012
 Two-dimensional (or planar, or 2D) flow 5925
 Two-mode network 8232
 Two-mode network data 6914
 Two-scale similarity transform (TST) 5842
 Two-sided matching model 9654
 Type 426, 7651, 8126
 Type of an agent 4788
 Type-1 fuzzy sets 4009
 Type-2 fuzzy sets 4009
 Types II, Π_1 , Π_∞ and III 3056
 Types of solitons 80
 Typical singularity 6697
- U**
- Uehling–Uhlenbeck equation 7807

- U-m [7424](#)
 U-m set [7424](#)
 UML [345](#)
 U-molecule [7424](#)
 Unbiased estimator [6992](#)
 Uncertainty [2450, 4317, 6565](#)
 Undecidability [755](#)
 (Un)decidability [9160](#)
 Undirected graph [4820, 8232](#)
 Unearned income [2285](#)
 Unfolding [703](#)
 Unfolding (folding) pathway [7027](#)
 Unfolding morphism [703](#)
 Uni-directional QKD [7265](#)
 Uniform distribution [2934](#)
 Uniform ellipticity/uniform parabolicity [6218](#)
 Uniform measure [2982](#)
 Uniform random sampling (Monte Carlo sampling) [5536](#)
 Uniform spanning tree (UST) [8710](#)
 Uniformizing maps [8710](#)
 Unintended consequences [4562](#)
 Unit doublet [3335](#)
 Unit quaternion [43](#)
 Unitary [7250](#)
 Unitary actions on Fock spaces [8556](#)
 Unitary ensembles [7505](#)
 Unitary operations [7201](#)
 Units [8588](#)
 Universal and non universal behavior [1443](#)
 Universal cellular automaton [7679](#)
 Universal constructor [8051](#)
 Universal inputs [6371](#)
 Universal modeling schema [8183](#)
 Universal properties [6407](#)
 Universal Turing machine (UTM) [114](#)
 Universality [755, 868, 1126, 5021, 5525, 6772, 6804, 7874](#)
 Unobserved effects [2770](#)
 Unpredictable system [8869](#)
 Unscented Kalman filter [5702](#)
 Unscented particle filter [5702](#)
 Unstable manifold [990](#)
 (Un)stable manifold [2265](#)
 Unstructured language [133](#)
 Unsupervised learning [5349](#)
 Unsystematic risk [3436](#)
- 3' Untranslated region (UTR) [9106](#)
 Update rule [114](#)
 Update table [7154](#)
 Updating [868](#)
 Upper approximation [7788](#)
 Upper cutoff [6992](#)
 Upper density [3084](#)
 Urban hierarchy [1042](#)
 Urban morphology [1042](#)
 Urban system [1042](#)
 Urbanism [7953](#)
 URI [8085](#)
 URL [10059](#)
 User equilibrium traffic assignment [9430](#)
 Utilitarianism [9933](#)
 Utility [457, 4855](#)
 Utility function [1587, 9411](#)
 Utility of voting [9933](#)
 UWT [6352](#)
- V**
- Validation [7591](#)
 Validation process [9000](#)
 Value [7630](#)
 Value stocks [3391](#)
 Vapnik–Chervonenkis dimension [5206](#)
 Variable or metric [7832](#)
 Variance and moments [3317](#)
 Variational approach [5960](#)
 Variational distance [7521](#)
 Variational iteration method [5161, 8453](#)
 Variational principle [9968](#)
 Variational principles [6587](#)
 Variety [8974](#)
 Varying cross-sectional rank (VCR) [3476](#)
 VCG mechanisms [5510](#)
 Vector computer/vector processor [149](#)
 Vector field [3256](#)
 Vector-borne diseases [1095](#)
 Vegetative index [1071](#)
 Vehicle communication protocols [2054](#)
 Vehicular traffic [9727](#)
 Velocity potential [9968](#)
 Velocity-weakening and strengthening [10047](#)
 Verifiable information game [8126](#)
 Verification [4855](#)

- Verification functions 6271
 Vertex degree 4821
 Vertex distance 4821
 Vertex eccentricity 4821
 Vertex (vertices) 8232
 Vertex-adjacency matrix 9211
 Vertical transmission 3206
 Very large scale integration (VLSI) 5861
 Very long baseline interferometry (VLBI) 4251
 Very-long-period events (VLP) 8153
 Very-long-period (VLP) event 9873
 Virtual character 1335
 Virtual machine 133
 Virtual world 1335
 Viscoelastic 1690
 Viscosity 868, 1690
 Viscosity solutions 4541, 6218
 Vision 8365
 Visual servo control system 43
 Volatile 6955, 9764, 9873
 Volatiles 9785
 Volatility 3436, 3476, 4114, 5588
 Volcanic crisis 9862
 Volcano hazards 9862
 Volcano monitoring 9862
 Volcano risk 9862
 Volcano status 9862
 Volcano unrest 9862
 Voltage encoding 5861
 Volume 9471
 von Neumann architecture 8869
 von Neumann neighborhood 868, 5861
 von Neumann universal constructor 8051
 von Neumann–Morgenstern stable set 1519
 von Neumann–Morgenstern utility function 1587
 Voronoi diagram 7549
 Vortex motions 3642
 VOS model 1642
 Voting cycle or Condorcet's paradox 9933
 Voting procedure, voting theory 9943
 Voting rule 9933
 v-precision 3985
 Vulnerability 3110, 9862
- Wage employment 2285
 Walk 4821, 9211
 Walk dimension 310
 Warning 9862
 Water waves 9968
 Watson-Crick pairing 489
 Wave dispersion 8113
 Wave fragment 7549
 Wave function 7424
 Wave interference 7290
 Wave number 4317
 Wave pattern 6459
 Wave vector 4317
 Waveform inversion 9873, 9900
 Wavelet 6856
 Wavelet and scaling filters 8669
 Wavelet and scaling functions 8669
 Wavelet system 589
 Wavelet transform 3893, 8522
 Wavelet transform modulus maxima method 3893
 Wavelets 5800, 10031
 Waves on a running stream 9968
 Weak coupling limit 7807
 Weak (defect-mediated) turbulence 6195
 Weak ergodicity breaking 5219
 Weak solutions 6218
 Weakly connected 8232
 Weakly connected component 10059
 Web graph 5266
 Web of data 8085
 Web science 8085
 Web server 10059
 WEB-IS 2347
 Webpage 10059
 Web-page ranking 5266
 Website 10059
 Weight matrix 8306
 Weighted distribution 4821
 Weighted graph 6495
 Weighted network 6048
 Weighted operator 8555
 Well-mixed hypothesis 8731
 (Well-posed) Hybrid dynamical system 4671
 Weyl pseudometrics 2232
 When issued 9565
 Whistler wave 8522
 White noise 8750

W

W3C 8085

Whitham averaged variational principle	9968	WT1D	1718
Whitham's conservation equations	9968	WT2D	1718
Whitham's equation	9968		
Whitham's equation for slowly varying wavetrain	9969		
Whitham's nonlinear nonlocal equations	9969		
Wide moving jam emergence	9501		
Wide moving jam traffic phase	9303		
Wiener process	8749		
Wigner surmise	7164		
Wigner transform	7807		
Wigner–Seitz radius	8576		
Winding number	9269		
Wirtinger inequality	6612		
WKB	6748		
Wolfram classes	755		
Word of mouth (w-o-m)	5378		
Workbook	4474		
Worldsheet	1643		
Worst-case setting	7119		
Wright–Fisher process	489		
Writhe	9269		
WT	6352		
		X	
		XC	7931
		XML	345, 8085
		Y	
		Yeast two-hybrid	570
		Z	
		Zeno (and discrete) solutions	4672
		Zero-one parameter	9034
		Zero-sum game	4855
		Zero-sum games	7630
		0th Postulate of quantum mechanics	4317
		Zeta function	8890
		Zeta-potential	5573
		Z-FRB	4080
		Ziff model	868
		Zinbiel algebra	1028
		Zipf's law	490
		z-Transform	10007

Index

A

A-not-B-Error 1888, 1893, 1901
A priori unstable systems 5088
A* path planning algorithm 1342
AAAI mobile robot competition 3691
Ab initio MD simulation method 692
Abacus 5473
Abduction 214
Abelian group 8028
Abel's identity 3265
ABM *see* Agent-based modeling, *see also* Agent-based modeling
Abnormal glycolytic activity, tumor locus 919
Abrupt climate changes 1097
Absence of many-particle effects 8488
Absolute continuity 4730
Absolute coordination 1541
Absolutely continuous 2938
Absolutely continuous curves 5440
Absolutely continuous function 3265
Absolutely continuous invariant measure with non-maximum entropy 966
Absorbing boundaries 8768
Absorbing state 3363, 3368, 4917, 7574, 8385, 8387, 8394, 8395
ABSS *see* Agent based social simulation
Abstract computing machine model 5467
Abstract game 6024
 endogenous network formation 6025
 feasible set 6025
 player preferences 6025
 rules of network formation 6025
Abstract input-output map 6375
Abstraction 1120
 in amorphous computing 266

AC *see* Artificial chemistry (AC)
Accelerating moment release (AMR) 2442
Acceleration by parallel electric fields 24
Acceleration mechanism 21
Acceleration rate 25
Accelerograph 2501
Access 6245
Accessibility 1052, 3532
Accessible fraction 6541
Accommodation 1885
Accreting sources 392
Accretionary lapilli 9802
Accretionary prism 9588, 10048, 10049, 10057
Accretionary wedge (prism) 10047
Accuracy 271, 275, 281, 291, 1826, 5206, 5207, 5211–5213, 7731
 lower approximation 7731
 QSAR models 7079
 sensitivity 1843
 specificity 1843
 upper approximation 7731
Accuracy rate 1997
ACE *see* Agent based computational economics
Acetaldehyde 1329, 1331
Acetylcholinesterase (AChE) 2133
 benzodiazepine receptor 2145
Acid dissociation 856
Acidosis
 carcinogenesis 915
 tumor invasion 919
Ackoff 9050
ACL *see* Agent communication language
ACO 2120, 8875–8877, 8879, 8880
Acoustic signal 9818
Acoustic speed, infrasound 4841

- Acoustic surveillance for hazardous eruptions
(ASHE) 4850
- Acoustic velocity, infrasound 4841
- Acoustic wave 6455
- Actin 1740, 1745–1757, 1761, 1762, 1765, 1768–1774
F-actin 1745, 1748, 1750, 1751, 1754, 1761, 1769, 1771
G-actin 1745, 1750, 1755, 1757, 1761
- Actin and myosin filaments 1749
- Actin-based 1769
- Actin-based cell motility 1772
- Actin-based motility 1753–1755, 1768, 1771–1774
- Actin-based movement 1756
- Actin-based propulsion 1753, 1756, 1757, 1771
- Actin comet 1756, 1769, 1771, 1772
- Actin cortex 1746, 1747, 1762, 1765
- Actin cross-linkers 1750
- Actin cytoskeleton 1751, 1771, 1774
- Actin filament 1745–1748, 1750–1755, 1757, 1765, 1768–1774
- Actin gel 1750, 1753, 1755, 1756, 1772, 1773
- Actin network 1749, 1753–1756, 1768, 1769
- Actin polymerization 1746, 1750, 1752–1754, 1756, 1768, 1772, 1773
- Actin treadmilling 1757
- Acting 1758
- Action 2939, 3872, 5192, 6599, 8555
affine 5485
disjoint 8558
ergodic 8555
indefinite 6603
Mackey 8563
mildly mixing 8555
mixing 8555
nil 8560
product 8562
rigid 8555
spectrally disjoint 8555
weakly isomorphic 8570
weakly mixing 8555
- Action-angle variable 2261, 4530, 5064, 5988, 6676, 7140, 8641
- Action function 6600
definition 5503
- Action identification 8422
- Action levels
- 2–1-choreography symmetry 5973
- Lagrange solutions in the 3 body problem 5977
- line symmetry 5973
- mountain pass solution in the 3 body problem 5977
- Action map 9242
- Action potential 283, 6100
- Action profile 1669
- Action research 3126
- Action schema 5191
- Action system 8186
- Action theory 8233
- Action/implementation threshold 7842
- Activated processes 1310
- Activation energy 1315
- Activation field 1893
- Activation function 1813, 1817, 2143
- Activator 6461, 6467
- Activator-inhibitor model 9713
- Activator-inhibitor systems 3349
- Active bond 8386, 8394
- Active galactic nuclei 29
- Active gels 1755, 1764, 1765, 1771
- Active gradient, in amorphous computing 264
- Active membranes 5524
- Active modelocking 6166
- Active perception 1119
- Active phases 3368
- Active polar gels 1764, 1765, 1770, 1771
- Active polymer solutions 1761
- Activity 8237
irregular 6105
potential 6105
sensitivity 600
spontaneous 6099, 6107
- Activity fronts 3363
- Activity paradigm 358
- Actors
aggregations of 8190
collective 8190
- Acts 7773
- Acyclic graphs 1254
- Acyclic relation 9946
- Adamatzky 5475
- Adaptability 290, 8370

- Adaptation 128, 1072, 1076, 1874, 1880, 1883, 1885, 1896, 1901, 7993, 9033
p-Adaptation 7905
- Adaption
 autonomous 1076
 planned 1076
- Adaptive 2848
- Adaptive actor architecture 154
- Adaptive agent 1883
- Adaptive law 51
- Adaptive planning framework 8439, 8440, 8449
 behavior specialist 8450
 decision broker 8451
 situation assessment specialist 8449
- Adaptive real-time classifiers 3251
- Adaptive visual servo control 1225
- Adaptivity in amorphous computing 265
- Adding machine 2958, 9250
- Addition energy spectrum, charging diagram 7317
- Additive cellular automata 66, 67, 73, 74
 asymptotic randomization 2993
- Additive pulse modelocking 6168
- Additively optimal universal, representation system 244
- Additivity 2862
- Address 6397
 encoding function 6397, 6401
- ADER-DG method 7904
- Adhesion 1743, 1747, 1750–1752, 1757, 1768–1770
- Adhesive 525
- Adiabatic algorithm 7387
- Adiabatic approximation 4194, 4198, 4200, 4201
- Adiabatic connection formula 8582
- Adiabatic decoupling 6689
- Adiabatic equilibrium 4596
- Adiabatic invariant 32, 5994
- Adiabatic limit 5024
- Adiabatic perturbation theory 6689
- Adiabatic switching 5869
- Adic transformations 2974
- Adjacency 8270
- Adjacency matrix 4829, 5266, 5354, 6001, 6241, 6836, 8284
 for the line graph 6837
- neural network 503
- polynomial coefficients of 6838
- Adjoint
 action 6314
 operator 6312
- Adjoint bundle 5505
- Adjoint calculations 7910
- Adjusted winner 3330
- ADM 5144, 5146, 5156, 5158
- ADMET (absorption, distribution, metabolism, excretion, and toxicity) 2196, 2210
- Adolescence 1889, 1905
- Adolescent health data 8313
- Adomian decomposition method 81, 83, 5144, 5163, 5167, 8505
 Adomian polynomials 81, 83
- Adomian polynomials 5164
- Adopters 1958
- Adoption rate 1967
- Adsorption 1307, 1319, 1320
 chemisorption 1307
 electronic effects 1319
 geometric effect 1319
- Adsorption-limited 7576
- ADTree alternating decision tree 2165
- Advanced driver assistance systems 3959
- Advanced traveler information systems 9430, 9433
- Advantages 6843
- Adversary argument 7123
- Adverse drug reactions 2170
- Adverse selection 5414, 6983
 repeated 6985
- Advertising 8134
- Adware 4370, 4371
- Adyan SI 780, 784
- Aerogel 3887
- Affect 2244
- Affiliation 8282
 network 8291, 8293, 8295, 8301, 8304
- Affine action, mechanical systems 5485
- Affine CA 2981
- Affine maximizer 5518
- Affine models
 affine continuous-time jump–diffusion models 8791
 affine dynamic term structure models 8793

- Affine structure 4527
 Affine systems 171, 3531
 Affinity chromatography 5659
 Affordances 1119
 AFM 7030
 Aftershock 2368, 2605, 5022, 5025, 5034, 7854, 9584, 9589
 Age of a cluster or fuzzy rule 3244
 Agency 4624, 4626
 Agency for International Development 2798
 Agenda 21 4636
 Agenda control 8136
 Agent 1055, 1057, 1110, 1896, 4626, 5286, 7534, 8375, 9412
 autonomous 7534
 decision-making 7536
 definition 187
 deliberative 188
 goal-directed 7534
 goal-oriented 7534
 in neoclassical economic theory 178
 intelligent agents 7534
 mobile 5604
 multiagent systems (MAS) 1109
 rational 7534
 reactive 188
 Agent actions 187
 Agent architecture 188
 Agent base (AB) cities 7967
 Agent-based computational economics (ACE) 177
 Agent-based computational methods 8266
 Agent-based computational model 1432, 8269, 8273, 8276
 Agent-based computer simulations 2805
 Agent-based model 1042, 1064, 1065, 6477
 Agent-based modeling (ABM) 115, 5384, 5386, 8317, 8371, 8376, 9051
 and neoclassical economics 177
 cellular automata approaches 186
 emerging behaviors 187
 grid computing 157
 guidelines for development 152
 large scale simulations 148
 limitations 152
 load balancing 154
 parallel computing 153
 program design 152
 protocol 153
 role of evidence 181
 role of physics 188
 scaling 152
 simulation 184
 Agent-based models (ABMs) 187, 848, 3375, 5999, 8047, 8315, 8317
 analytical 3375
 computational 3375
 Agent-based simulation 92, 362
 platforms for 193
 Agent-based social simulation (ABSS) 177
 Agent communication language (ACL)-based models 191
 Agent complexity, role in simulation 153
 Agent interaction 187, 190
 direct 191
 environment mediated 193
 indirect 192
 models, taxonomy 191
 Agent theory 7534
 cognitive systems 7542
 computational agents 7536
 deliberative agents 7541
 endogenous 7534
 exogenous 7534
 game-theoretic models 7536
 goal-directed agents 7539
 limited autonomy 7544
 limited knowledge 7545
 neural nets 7538
 strategic action 7545
 Aggregate 9800
 time effects 2771
 Aggregated 4871
 Aggregation 884, 4604
 cluster-cluster 3708
 diffusion-limited 3707
 kinetic 3707
 with injection 3813
 Aggregation algorithms 7723
 Aggregation operator 224, 226
 Aggregative games 3194
 AGIL-schema 8186
 Agile computing, definition 5615
 Aging 2036

- Agmon metric 6747, 6756
 AGNA 8848
 Agnostic bonds 1325
 Agree-and-pursue algorithm 7713, 7722
 Agree to disagree 436
 Agricultural production 1071
 Ah receptor 2146
 Aharonov–Bohm (AB) effect 7213, 8598
 Aharonov–Bohm (AB) flux 7671
 Aharonov–Bohm (AB) interference 9650
 Aharonov–Casher effect 9651
 Aharonov–Bohm (AB) ring 7290
 AI-engineering 4336, 4337
 AIDS epidemic 4660, 4662
 Air pollution, allergic reactions 1100
 Air traffic
 current 235
 future 235
 Air traffic dynamic 1180
 Air traffic flow 234
 Air traffic network
 automation 242
 efficiency 242
 non-linear growth 242
 Aircraft market models 685
 Airport
 hub 239
 problems 1661
 secondary 239
 AIRS – artificial immune recognition system 2124
 Akaike Bayesian information criterion 1698
 Akaike criterion, neuro-fuzzy systems 6095
 Akaike information criterion (AIC) 9918
 Akaike’s information criterion 9598
 AKNS method 4960, 4964, 8481
 AKNS pair 4964
 Alarm 3126, 3301
 Albedo feedback 9
 AlChem 330
 Alcohol consumption 6010
 Alexander–Orbach conjecture 319, 6535
 Alexander, Malcolm 8269
 Alfvén speed 24
 Alfvén waves 34, 8527
 Alfvénic flux tubes 8526
 Algebra 703, 5454, 8292, 8294, 8295, 8297–8299, 8301, 8305
 of vector fields 6184
 σ -Algebra 5454
 Algebraic action, invariant measure classifying 4990
 Algebraic branching equation 6344
 Algebraic connectivity 6241
 Algebraic dynamical systems 3049
 Algebraic eigenspace 6247
 Algebraic graph-theory 7720
 Algebraic models 8273
 Algebraic number field 7104
 Algebraic product 4067
 Algebraic Riccati equation 8756
 Algebraic set theory 8266
 Algebraic structures 6289
 Algorithm 272, 4180, 5743, 6407, 8735, 8739
 adiabatic 7109, 7113
 black-box 7090, 7091, 7093
 coevolutionary algorithm 4136
 continued fractions 7094
 CSM 6399, 6400
 evolutionary algorithm 4133
 exact 7093, 7098
 genetic 4134
 Gillespie 8735
 Green’s function reaction dynamics 8742
 Grover’s 7113
 hybrid 8739
 in artificial chemistry 327, 330
 Kitaev’s 7094
 M8 4180
 MSc 4180
 of Girvan and Newman 1150
 optical 6393, 6403
 particle-based 8743
 prediction 4186
 RTP 4181
 Shor’s 7089, 7090, 7093, 7113
 Simon’s 7092, 7100
 SSE 4181
 stochastic simulation 8735
 tau-leaping 8737
 topological 7110, 7113
 wave-front tracking 9745
 with approximation guarantees 9959

Algorithmic complexity 967, 7165
 Algorithmic model 1280
 aLife 1336
 Aligned frame 6466
 Alignments 7064, 9851
 Hough transform 9851
 two-point azimuth method 9851
 Alkane 2199
 All-atom 7034
 Allen–Cahn theory 873
 Allergenic neophytes 1100
 Allergies, caused by pollen 1100
 Allocation 1512, 1526
 individually rational 1526
 Pareto efficient 1526
 Allocation rule 6044
 Allometric 477
 Allometric law, biological fractals 3784
 Allometry, biological fractals 3780
 Allophone 2310
 Alloy
 bulk 1322
 electronic effect 1321
 geometric effect 1322
 near-surface alloy 1322
 surface 1322
 Almost conjugacy 8900
 Almost equicontinuous 9237
 Almost global existence 6710
 Almost-invariant subspace 6693
 Almost-periodic 6627, 6632
 Almost sure invariance principle 966
 Alonso-Sanz, Ramon 8833, 8835
 α -Cut 3990, 4064
 α -Helices 9752
 α -Level set 4047, 4064, 8682
 random 4052
 Alpha-relaxation 4214
 Alpha stable distribution 3413
 Alphabet 5634
 code 2315
 symbol system 2315
 Alternating offers bargaining 4105
 Alternative futures 7835
 Alternative method 5303
 Ambrosetti–Prodi problem 6620
 Amenable 2945

Amenable group
 Følner sequence 4994
 Ames genotoxicity 2145
 Amino acids 9752
 Ammonia
 elementary steps 1313
 synthesis 1313
 Amoeboid cell motility 1772, 1773
 Amoeboid motility 1738, 1742, 1743, 1745, 1747, 1748, 1753, 1756, 1757
 Amoeboid movement 1770
 Amorphous computing 257, 929
 gradients as primitives 264
 in artificial chemistry 341
 linguistic framework for 263
 means of abstraction 266
 means of combination 266
 model 258
 modeling of classical partial-differential equations 264
 restriction to spatial regions 266
 supporting infrastructure 267
 Amorphous computing paradigm 260
 Amorphous particle, marker propagation 260
 Amorphous solid 4211
 Amplification
 of memory effects 1625
 relative 7849
 significant 7849
 supply chain 7849
 temporary 7849
 Amplification ratio 7849
 Amplification ratio magnitude 7849
 Amplitude 7605
 Amplitude amplification 7096
 Amplitude dispersion 9978
 Amplitude equation 392, 6461, 6469, 6470, 6474
 Newell–Whitehead–Segel (NWS) 6463
 Amplitude estimation 7097
 Amplitude instability phase instability 6117
 Amplitude noise 6117
 Amplitude parameter 9984
 Amplitude ratios 6528
 amplRes 6398, 6399, 6401
 Analog 5474

- Analog computation 276, 3335, 3354, 3356, 3357, 9705
 general-purpose 274
- Analog computing 3335
- Analog equation solver 5474
- Analog field computers 3340
- Analog mechanical computing device 5474
- Analog memory 280
- Analog thinking 283
- Analog VLSI 275
- Analogue experimentation 9786
- Analysis 10015
- Analysis method 5023
- Analytic approaches to the minority game 5598
- Analytic signal 636
- Analytical engine 285, 5476
- Analytical learning 5193
- Analytical methods for structural dominance analysis 8988
- Analyzing wavelets 3898, 3899
- Anasov's theorem 4595
- Anchor text scoring 5271
- Anchoring 1557, 4978
 multiplicative 1557
- Ancilla 7255
- AND 4879
- AND gate, reversibility 7366
- Anderson model 7345, 8590
 invasive tumor 917
 multi-impurity 7357
- Anderson theorem 6309
- Anderson–Weiss–Kubo (AWK) theory 8595
- Anderson's Wiener process 6307
- Andness 228
- Anelasticity 2695
- Anesthesia 1437
- Angell plot 4212
- Angiotensin converting enzyme (ACE) 2131, 2145
- Anharmonic forces 2258
- Anharmonic oscillator 6739
 generalized 6739
 quartic 6739, 6740
- Animals 3280, 7824
- Animated work environment 1476, 1480
- Anisotropic diffusion 10033, 10037, 10038
- Anisotropic filtering 10042
 Anisotropic properties 5921
 Anisotropy 5024, 6480, 6572
- Annealed law 7521
- Annihilating random walkers 8386
- Annihilation 1557
- Annihilation operator 8933
- Annihilation process 3366, 3367
- Annihilation reaction 3366, 7573
- Anomalous diffusion 3888
- Anomalous resistivity 8547, 8549
- Anomalous statistics 3591
- Anomalous transmission of EM waves 2622, 2623
 anomalous reception of VHF waves 2629
- Anosov action 3097
- Anosov and Anosov-like systems 992, 996, 999, 1007, 1008
- Anosov diffeomorphism 3097, 6951
 SRB measure 6952
- Anosov flow 3046, 3098
- ANS 7993
- ANS involvement 7993
- Ant colony optimization 123, 2120, 8869, 8875, 8876
- Ant in the labyrinth 1398, 1418, 3855
- Ant trails 1280
- Antecedent 4871
- Anterior cingulate cortex 8005
- Anti-kindling 639
- Anti-persistence 5589
- Anti-phase 5720
- Anti-Stokes line 6752
- Anti-symmetry, icosahedral group 5970
- Antibody, autoimmunity 4780
- Anticancer 2190
- Anticipation 6492, 9732
- Anticipatory model 858
- Anticrowds 5596
- Antidepressant 2186
- Antikythera mechanism 272, 5474
- Antiphase 1545
- Antisoliton 8494
- Anxiety 3470, 3472
- Anytime agent 1347
- Apennines 2399
- Apoptosis induction 2186
- Apparent duration time 7916
- Apparent stress 2483, 2485, 2585

- Apparent threshold 6573
 Applicability domains, QSAR models 7078
 Applicative computation 5296
 Approachability 7637
 Approval voting procedure 9954–9956
 Approximate controllability 4809
 Approximate reasoning 4871, 4880
 Approximation 1724, 4358, 7790
 - Diophantine 3029, 3032, 3033
 - M*-term 1724
 - metric Diophantine 3029
 - non-linear 1724
 - order, multiwavelet 5847
 - space 7787, 8338
 - with dependent quantities 3033
- Approximatively controllable 3528
 APS operator 2221
 - property 2221
- Aptamer technology 567
 Aquatic toxicity, consensus QSAR models 7082
 Aqueous solubility 2144, 2187
 Aqueous toxicity 2183
 AR *see* Assistive robotics
 Ar fluid flow in SWCNT 696
 Arbitrage 5410
 Arbitrage pricing theory (APT) 3475, 3477, 4126, 4972
 Arbitrary exponential rate observer 6374
 Arbitration 6081
 Arborescence, spanning 6250
 Arc 6241, 8246, 8322
 ARCH 3475, 3478, 3492
 - model 5328
- Archetypal swing 7833
 Archimedean t-norm 4416
 Arching 3151
 Architectural spandrels 5699
 Architecture
 - CMOL 5881
 - of agents 188
 - quasi-regularity 5867
 - random 5867
 - reconfigurable 5867
 - regular 5866
 - unstructured 5867
 - von Neumann 5879
 - von Neumann architecture 5883
- Arcing 5321
 Area sampling 8226
 Arenal volcano, tremor signal 4849
 Arequipa earthquake analysis 4843
 ARIMA 3439
 Aristotelian physics 6663
 Arithmetic mean 227, 228
 Arithmetic operation 5475
 - artificial chemistry 331
- Arithometer 5476
 Arm retraction, entangled polymer dynamics 6823
 ARMA (auto-regressive moving average) 5206, 5208, 5216
 Arms control and disarmament 4856
 Arms race 4137
 Armstrong's axioms 7737
 Arnold 704, 5074
 - work in reduction theory 5493
- Arnold cat map 996, 999, 1007
 Arnold diffusion 387, 409, 2279, 4519, 5081, 5987, 8642
 Arnold tongues 5309
 Arnold's scheme 5075
 Arnold's transformation 5075
 Arrest stress 5025
 Arrhenius law 2035
 Arrhythmia 480
 - fibrillation 483
- Arrow 9944
 - of time 3269, 3278
- Arrow's impossibility theorem 5513, 9934, 9937
 Artifact mediated models 192
 Artificial chemistry (AC) 120, 326, 928
 - building block 328
 - definition 326
 - engineering motivation 327
 - information processing 341
 - inspired by Turing machine 333
 - mechanical 336
 - scientific motivation 326
 - simulation by ODE 332
 - theory 337
- Artificial emotions 1120
 Artificial immune system (AIS) 1303, 2124, 4776
 - genetic variation 4778

- Artificial intelligence (AI) 1111, 3334, 3358, 4894, 8093, 8873, 8886
 good old-fashioned AI 8096
 strong AI 1111
 weak AI 1111
- Artificial life 115, 1336, 8067
- Artificial metabolic network, evolution 505
- Artificial neural networks (ANN) 122, 1110, 1813, 2141, 3475, 3479, 3487, 3491, 4403
 approach 7995
 neural networks 1110
- Artificial neuron 1813, 2143
- Artificial organism 333
- Artificial society 8416
- Artificial-to-intelligence ratio 4138
- Artificial worlds 4911
- Arzela–Ascoli's lemma 3259
- As-if defense 178
- Ascendancy, ecosystem 2708
- Ash 9884
- ASHE *see* Acoustic surveillance for hazardous eruptions (ASHE)
- Asia 7846, 7848
- Aspect ratio 2688, 6573
 equivalent aspect ratio 2691
- Asperity 5026, 9588, 9640, 10055
 contact 5025
 model, earthquake waveforms 2551
- Assembler automaton *see also* Von Neumann machine
- Assessment
 linguistic 4048
 subjective 4048
- Asset
 pricing model 3378
 risky 5400
- Assignment games 1525
- Assimilation 1885
- Assistive robotics (AR) 4648
- Associated flow
 ergodic theory 3065
- Association 4401
- Association analysis 1991
- Association mining 4363
- Association rules 4147, 4363, 7738, 7777, 7778
 confidence 7739
 support 7739
- Assortative interaction 4667
- Assortativity
 assortative 6054
 coefficient 6054
 disassortative 6054
- Assumptions, neoclassical economics 179
- Asteroid belt 6438, 6443
- Asteroids 387
- Astrobiology 3268
- Astronomy 6663
- Astrophysical jets 29
- Asymmetric dynamic commons model 2226
- Asymmetric information 6977
- Asymmetric phase 5590, 5598, 5600
- Asymmetric rule 618
- Asymmetric tree, fractal dimension 3783
- Asymmetry 1557
 ecological 2706
- Asymmetry parameter 7668, 7672
- Asymptotic 9237
- Asymptotic analysis 7607
- Asymptotic behavior 3867, 6999
 of the transition semigroup 6232
- Asymptotic equipartition property 6944
- Asymptotic freedom 6665
- Asymptotic phase 8639
- Asymptotic randomization
 additive cellular automata 2981
 linear cellular automata 2991
- Asymptotic series 6739
 strong 6739
- Asymptotic stability 4897, 6427
- Asymptotical treatments 8593
- Asynchronous cellular automata 916
- Asynchrony 8869, 8880–8883
- Asystematic mobility 9426
- Atmospheric model intercomparison project (AMIP) 1707
- Atmospheric noise 1701
- Atmospheric science 8113
- Atmospheric water vapor 1701
- Atom pair descriptors, chirality-sensitive 7075
- Atom, ultra-cold 9680
- Atomic ensemble 9679
- Atomic force microscopy techniques 4220
- Atomic information descriptors 4824

- Atomic rate equations, coupled cavity-atom rate equations **6128**
- Atomic shell approximation (ASA) **7429**
- Atomic susceptibility **6123**
- Atomic unit **8575**
- Attachment **1903, 4487, 4489**
model, biological fractals **3790**
preferential **4487, 4489**
- Attacks on mobile agents **5610**
- Attention **1119**
parameter **8939**
- Attenuation **2482, 8271**
- Attenuation relation (Ground-motion prediction equation, GMPE) **4435**
directivity effect **4450**
empirical **4462, 4468**
ground-motion scaling relations **4440, 4462**
velocity-pulses **4450**
- Attracting heteroclinic **6629**
- Attracting tori **6629**
- Attractiveness **8240**
- Attractor dynamics **1438**
- Attractor reconstruction **3021**
- Attractor states, GRNs **1182**
- Attractors **733, 1002, 1547, 1881, 1886, 1898, 1899, 2234, 2247, 3828, 4723, 5721, 6106, 6108, 6111, 6134, 6952, 7992, 8040, 8192, 8420, 8422–8426, 8430, 8645, 8927, 9224, 9232, 9255**
as cell types **1199**
cell types **1203**
cultural **8195**
gene expression **1204**
genes **1190**
Lorenz attractor **3837, 3838**
self-esteem **8423**
socio-structural **8195**
- Attribute **1826, 1988, 5737, 7754, 7787**
condition **7756**
decision **7756**
decision node **1826**
dependency **4360**
node **1826**
sampling **4861**
types **1988**
- Attribute-based data model (ABDM) **4305**
attribute-value pairs **4305**
directory keywords **4307**
- non-directory keywords **4307**
records **4306**
- Attribute-value blocks **7799**
- Atypical graph **6013**
- Aubry–Mather set **6217**
- Aubry set **4542, 4549–4551**
critical equation **4554**
dynamical properties **4554**
metric characterization **4553**
- Auction mechanisms **4112**
- Auction theory **429**
- Auctioneer, Kyle model **5400**
- Auctions **5393, 6978**
Dutch **6986**
English **6985**
first-prize **6978**
sealed-bid **6986**
second-prize **6978**
- Audition **2321**
- Auditory error maps **2320**
- Aumann model **429, 432, 440**
- Aumann–Shapley rule **1682**
- Auroral electrons **33**
- Auslander–Yorke dichotomy theorem **9237**
- Australia **3110, 3126, 3133, 3134, 3138**
- Austrian school of economics **207**
- Authentication codes, partial result **5612**
- Authority **5272**
- AUTO-07p **6349**
- AUTO, numerical studies **6596**
- Autocatalysis **485, 4920**
biochemical switches **485**
bistable **485**
hysteresis **485**
- Autocatalytic polymer chemistry **332**
- Autocatalytic process **208, 1889**
- Autocatalytic set **120, 337**
evolution of **339**
- AUTOCLASS **5054**
- Autocorrelation **3804**
- Autocorrelation function **3712, 3716, 3717, 6253, 6998, 7919**
fractal time series **3794**
- Autogenic training **7994, 7995**
- Automata **418, 892, 4240, 8869**
- Automata gas **9413**
- Automated highway systems **3960**

- Automation, of modeling and simulation 353
 Automaton 5651, 5653
 Automorphism 173, 2935, 8289, 8555
 approximatively transitive 8555
 Chacon 8561
 GAG 8566
 Gaussian 8565
 Gaussian–Kronecker 8566
 induced 8555
 infinitely divisible 8571
 interval exchange 8568
 loosely Bernoulli 8567
 Poissonian 8566
 rank one 8564
 Automorphism group 8899
 Autonomous systems 61, 4931, 4933
 dynamical systems 6178
 Autonomy 187, 1889, 1905, 4899
 human–robot interaction 4651
 of interacting agents 192
 Autoparametric resonance 2323, 2332, 6636
 Autoparametric systems 6636
 Autopoiesis 8040
 artificial chemistry 338
 Autoregression theory 6095
 Autoregressive (AR) model 2746, 2753, 2754, 9598, 9914
 linear 3509
 nonlinear 3509
 Auxiliary model 217
 Avalanche 644, 1131, 1136, 2036, 5022, 7014, 8028, 8029
 Avalanche models 1707
 Avalanche photodiode 7251
 Average bonds per object 1444
 Average class accuracy 1997
 Average entropy of information 4821
 Average memory 824
 Average partial effect 2776, 2782
 Average structural function 2782
 Average voting 9954
 Averaged guiding function 6618
 Averageness 2246
 Averaging 4595, 6627, 8642
 Averaging algorithm 7713, 7719
 Averaging principle 8642
 Averaging theorem 6326
 Averaging theory 5076
 dynamical system 1032
 mechanical systems 1029
 Avida 115, 335
 Avoided criticality 4230
 Aw–Rascle macroscopic traffic flow model 9335
 Axelrod model 6385, 8393, 8397
 Axelrod, Robert 8382, 8393
 Axial mode 6124
 Axiom A 8644
 Axiom A flow 3047
 Axiom of Archimedes 6290
 Axiom of quality 8294, 8295, 8305
 Axiomatic characterizations 1513
 Axisymmetric KdV equation 9995
 Axon 1814, 3334, 3343, 4871
- B**
- B-Form 5802
 B-Indiscernibility relation 4412, 4417
 B-Lower approximation 1792
 B-Spline 6361
 B-Upper approximation 1792
 b-Values 7927
 B2B 7846
 B2C 7846
 Babbage, Charles 285, 5476
 Babbage’s difference engine 5476
 Babbling 2320
 Back-arc 7924
 Backbone 1395, 1404, 1410, 1412, 3705, 3709, 3853, 6535, 6538, 6574, 7827
 bonds 2840
 fraction 6541
 probability 1404
 Backgammon 4144
 Backpropagation 280, 1819
 Backscattering enhancement 7921
 Backward pass 1819
 Backward search 5350
 Bacterial colony growth 3787
 Bacterial computer 9706
 BADD-OWA 230
 Bagging 3475, 3491, 3492, 5320
 Bak–Sneppen model 3795
 Bak–Tang–Wiesenfeld (BTW) model 646, 6992

- Baker–Campbell–Haussdorf formula 6180
 Baker diagram 75
 Baker's map 996, 998, 999, 1007
 Bala–Goyal rules 6026
 Balance 6105, 8270
 equation 3643, 4382
 in graphs 8267
 laws, fluids in the Eulerian description 5928
 Balanced environment 7526
 Balancedness 1511, 1512
 Baldwin effect 1925
 Baldwin, Frank S. 5476
 Baldwin, Joseph M. 9944
 Baldwin's procedure 9948
 Ballistic aggregation 3721
 Ballistic behavior 7524
 Ballistic computer 5470
 Ballistic deposition (BD) 3788
 Ballistic transport 7664
 Balzer 3539, 3540
 Banach algebra 2995
 Banach principle 2937
 Banach space 7442
 Band detector 564
 Band structure 7403
 calculation 5916
 Bandwagon effect 1965
 Bandwidth conservation 5614
 Bang-bang principle 5443
 Bank 2812
 Banks' solution 9953
 Banks winner 9953, 9958
 Bar-joint graph 2838
 Barabási–Albert model 654, 4489
 Barabási, Albérto-Laszlo 8269, 8277
 Barbalat's lemma 51
 Bargaining 8135
 Barkhausen noise 5022
 Barnes, John 8268
 Baroclinic fluid 6206
 Barotropic fluid 6207
 Barred galaxy 413
 Barriers 2034, 3125
 bureaucratic process 3126
 entry 7838
 exit 7838
 inertia 7838
 innovator 3126
 Bartholdi, L. 784, 789
 Basal ganglia 641
 Base models 5319
 Base-superstructure 8184
 Basic element 8987
 Basic idea 7790
 Basic minority game 5589, 5596, 5597, 5601
 Basic reproduction number 4662
 Basic reproduction rate 4659
 BASICS 7835
 Basin and range province 2612
 Basin of a measure 958
 Basin of attraction 1548, 1881, 3828, 6039, 8424,
 8425
 Boolean networks 1199
 Basis 5461, 5462
 Baskin–Palyulin–Zefirov neural device 2150
 Bass 8307
 Bass diffusion model 681
 Bass model 1957, 8307
 Bässler law 4212
 Batagelj, Vladimir 8272
 Batch learning 1816, 1819
 Bates stochastic volatility jump-difussion model
 8792
 Bathymetry 9587
 BAttelle scenario inputs to corporate strategies
 7835
 Bayes affinity fingerprints 2171
 Bayes factor 446
 Bayes' theorem 442, 456, 2413, 9192
 application of Bayes' theorem to inverse
 problems 9192
 Bayesian 2747, 2750, 2752
 Bayesian approach 4874
 to estimation 2748
 Bayesian classifiers 2170
 Bayesian demand game 1681
 Bayesian econometrics 443
 Bayesian equilibrium 428, 436, 437, 439, 441
 Nash–Bayes equilibrium 437
 Bayesian estimation 2749, 2751, 2753
 Bayesian F-test 448
 Bayesian game 427, 436, 437, 4096, 8665
 Bayesian mechanism design 5519

- Bayesian methods 2170
 Bayesian–Nash equilibrium 5510, 5519
 Bayesian network 518
 modeling 728
 Bayesian probability theory 457, 7856
 Bayesian regularized neural network (BRNN) 2153
 Bayesian solution, belief invariant 1594
 Bayesian statistical inference 1230
 Bayes factors 1239
 Bayesian computation 1230
 Bayesian information criterion 1239
 likelihood 1230
 marginal likelihood 1230
 posterior distribution 1230
 prior predictive distribution 1230
 prior probability distribution 1230
 BBKGY hierarchy 7810, 7815
 BD *see* Ballistic deposition
 BDI model 188
 BDS 3443
 test 3509, 3520, 6260, 6261, 6266
 Beam splitter 7252
 Bear market, fuzzy logic 3997
 Beckmann’s transformation
 Equivalency conditions 9439
 Uniqueness condition 9440
 Bed capacity 7845
 Beehive rule 8834
 Behavior 346, 2846, 6079
 Behavior-based control 3682, 3689
 Behavioral 2845, 5431
 Behavioral contract theory 6987
 Behavioral economics 8998
 Behavioral instability 8004
 Behavioral science 1347
 biological fractals 3780
 Behavioral strategies 4863
 Belgrade 2797
 Belief assessment 7622
 Belief-desire-intention (BDI) model 188, 1337, 8378
 Belief subspace (BL-subspace) 432, 433
 Beliefs 3378, 7542
 coherent infinite hierarchies of 431
 fundamentalist 3378
 infinite hierarchies of 427, 428
 trend-following 3378
 Bell basis 7256
 Bell measurement 7256
 Bell inequality 1015
 quantum weirdness 7377
 Bell state 1015, 1025
 Belousov–Shabotinsky (BZ) reaction 8941
 Belousov–Zhabotinsky (BZ) reaction 886, 887, 1355, 3293, 3357, 9709
 Ben-Zion and Rice model 5025
 Bénard convection 6464
 Bénard system 4896
 Benchmarking 7840
 Bending flexibility 698
 Bending rigidity, polymer physics 6815
 Beneficial mutations 5657
 Benford’s law 3042
 Benjamin–Bona–Mahoney (BBM) equation 8512
 Benjamin–Feir instability 10003
 Benzodiazepine receptor 2127, 2184
 Berezinskii–Kosterlitz–Thouless phase transition 4493
 Berkowitz, Steven 8269
 Berners Lee, Tim 10059
 Bernoulli endomorphism 3002
 Bernoulli equation 9972
 Bernoulli flow 4991
 Bernoulli graph 8214, 8321, 8323
 Bernoulli measure 2981
 Bernoulli property 961, 2929
 isomorphism 4988
 Bernoulli sampling 8216
 Bernoulli shift 4984
 isomorphic transformation 4986, 4988
 Bernoulli system 5455
 Bernstein–Bézier polynomials 5803
 Bernstein–Moser lemma 5079
 Bernstein–Vazirani algorithm 7181
 Berry curvature 8106
 Berry–Esseen inequality 965
 Berry phase 4194, 4196–4198, 4200–4203, 4206, 4208, 4209
 Berry’s conjecture 1008
 Bertoluzza et al’s distance 8686
 Besicovitch pseudodistance 249
 Besicovitch pseudometric 2236

- Bessel equation 8722
 Bessel process 8708, 8713, 8722
 Best-guess estimation 54
 Best modeling practices, QSAR models 7084
 Best response dynamics 5178
 β -Active nuclei 8590
 Beta-effect, planetary 8494
 Beta function 6665
 β -Mixing 5214
 β -Sheets 9752
 Beta statistic 2604
 Bethe-Ansatz 7347
 Bethe lattice 611, 620, 1403, 1406, 7823
 theory 2835
 Betweenness 6053, 8271
 centrality 2741, 6049, 8287
 edge betweennes 6049
 node 6049
 Beyer 3559
 BGP 4930, 4932, 4933, 4943–4945
 Bi-fractal 3775
 Bi-fractional diffusion equations 5231
 BI Index 4830
 Bi-orthogonal wavelet transform 6354, 6355
 Bi-orthogonal wavelets 10033
 Bianchi identity 5505
 Bias 5198, 6785
 Biased net theory 8321
 Bipartite 8288
 Biclusters 1786, 1787
 Biconvexity 7645
 Bid-ask spreads 3472
 Bieberbach conjecture 8718
 Bifractality 3903, 3904
 Bifurcation 10, 1542, 1898, 2324, 3271, 4515,
 6134, 6136, 6195, 6198, 6311, 6331, 6590, 8929
 bifurcation parameters qualitative change 1542
 diagram 5721, 6331
 equation 6609
 equations 5300
 Hamiltonian Hopf 7145
 Hopf 6311, 6325, 6461, 6469, 6474
 Hopf–Neimark–Sacker 6311, 6325
 imperfect 7143
 liquids 5935, 5940
 mapping 5304
 organization of 7144
 period doubling 2330
 period multiplying 2331
 pitchfork 2330
 point 5487, 5935
 quantum 7136
 quasi-periodic Hamiltonian Hopf 6325
 quasi-periodic Hopf 6325
 saddle-node 7143
 symmetry-breaking 6461, 6469
 Taylor–Couette flow 5937
 theory 2330
 Big-bang 3274
 Bilateral-unilateral rules 6032
 Bilinear form 8481
 Bilinear model 5327
 Bilinear process 6253
 Bilinear realization 6376
 Billiard ball model (BBM) 5875, 7690, 7700
 Billiards, quantum 7166
 Bimartingale 7644
 Binary alloy 2819
 Binary arithmetic 9705
 Binary Boolean set-operations, definition 6286
 Binary counter 5638, 5639
 Binary granular data model (BGDM) 4346
 Binary GrC model, third 4346
 Binary Hamming code 7328
 Binary neighborhood system (BNS) 4346
 Binary output encoding 1821
 Binary relation 8291, 8292, 8298, 8300
 Binary search method 6534
 Binary selection variable 2780
 Binary, gravothermal oscillation 8693, 8694
 Binding 1553
 problem 1439
 Binning 7005
 Binocular rivalry 1436
 Bio-engineering methods 922
 Bioastronomy 3268
 Biobrick 421
 Biochemical information 489, 494, 498, 500
 Biochemical network models 512, 522
 Biochemical reaction networks 518, 519, 521
 metabolic 519
 signaling 519
 transcriptional regulatory 519
 Biochemical systems theory 559

- Biocomposites 1289
 bone 1291
 exoskeleton 1289
 exoskeletons 1289
 leaf 1292
 nacre 1290
 spicules 1291
 sponge 1291
 wood 1291
- Biodiversity 2903, 9104
- Biofuel 1078
- Bioinformatics 418, 923, 929, 1227, 3798, 4407
 biological fractals 3780
 ecological systems 2708
- Biological complexity 489, 1537
 measure 491
- Biological coordination 1543, 1558
- Biological data integration 513
- Biological evolution 1876, 1879, 3270, 3280
 fractals 3795
- Biological fractals 3786
 physical models 3785
- Biological function 719
- Biological information
 definition 498
 shared entropy 498
- Biological motifs 5699
- Biological motion 8205
- Biological networks 720
 Boolean networks 726
 genetic regulatory networks 721
 metabolic networks 723
 neural 4403
 protein–protein interaction networks 722
 signaling network 727
 signaling networks 723
- Biological neuron 1814
- Biological systems, complexity in 5693
- Biologically-inspired 923
 algorithm 4778
 computational algorithms 121
 hardware 929
 optimization 1786
- Biology 3278
 fractals 3779
 synthetic 258
- Biomarkers 9096
- Biomimetics 923, 1298
- Biomineralization 1289
- Biomolecular network 570
 bipartite 574
 directed 573
 quasi-bipartite 574
 undirected 574
- Bionanomachines 7027
- Bionanotechnology, biomaterials, energy 417
- Biophysical coupling 1548
- Biosensing 417
- Biosphere 3280
- Biotechnology 423
- BioWatch 930
- Bipartite 8281
 Bipartite graph 8356
 Bipartite matching 2839
 Bipartite network 6048, 8258, 8322, 8330
- Bipolar depressive, internal state 8426
- Birefringent optical fiber 1388
- Birkhoff ergodic theorem 4986
- Birkhoff normal form 2279, 6710
- Birkhoff pointwise ergodic theorem 957, 9241
- Birkhoff theorem
 ergodic probability measures 3017
- Birth-and-death process 9292
- Birth–death process 8770
- Bisimulation 8340
- Bismut–Elworthy formula 6234
- Bispinor 3875
- Bistability 566
 networks 1193
- Bistable 5720
- Bistable dynamics 1193
- Bistable genetic circuits 1193
- 1-Bit CA 3554
- Bivalent logic 3986
- Bivariate M-wavelet system 590
- Bjerrum length, polymer physics 6816
- Black and Scholes 4117
- Black and Scholes formula 4117
- Black-box 7090, 7091, 7850
 groups 7187
 models 1999, 7119
- Black monday 3404

- Black–Scholes model 8792
 quadratic return variation 8786
 volatility smile and smirte 8790
- Black–Scholes option pricing model 3445
- Blackboard architecture 192
- Blackwell-set 7638
- BLAS 5757
- Blastula 526, 532, 533, 537, 538, 542
- Blobs 1601, 3705, 3709
- Bloch-sphere representation 7227
- Bloch-vector, quantum computing 7227
- Bloch's method 6732
 ϵ_2 6733
 ϵ_3 6733
- Bloch's solution 8592
- Block co-polymer 6827, 6828, 6843
 vesicle, chain configuration 6830
- Block density, fracture networks 6516
- Block diagonal matrix 7516
- Block mapping
 parallel computing 154
- Block-slider 2576
- Block-tridiagonal matrix 8602
- Blockage 3151
- Blocking word 9250
- Blocking, parallel computing 155
- Blockmodel 8293, 8300, 8301
- Blockmodeling 8263, 8266, 8273, 8289
 indirect approach 6915
 regular equivalence 6915
 structural equivalence 6914
- Blocks 1724, 4182, 4415, 7829
 complete 6916
 1-covered 6916
 negative 6916
 null 6916
 partitioning 1724
 positive 6916
- Blogs
 livejournal 10067
 mobile blogging 10070
- Blood-brain barrier (BBB) 2155, 2167
- Blowing snow models 1706
- BlueGene 5758
- Bluegill sunfish, daphnia magna, tetrahymena pyriformis 2145
- Blum 279
- Body force, fluids 5928
- 3-Body problem 5970
 mountain pass solutions 5976
 planar 5972
 planar symmetry groups 5971
- Body-wave magnitude 2479, 2486
 cumulative 2488
 earthquake 2664
- Bogoliubov transformation 9691
- Bogomolnyi bound 1646
- Bohm 3353
 Bohm diffusion 27
 Bohr recurrence 3092
- Boids 1336
- Boiling point 2198
- Boiling temperature 2144, 2146, 2169
- Boltzmann 3054
 Boltzmann constant 2860
 Boltzmann distribution 4912, 6119, 6129, 7011
 Boltzmann equation 4908, 7415, 7817
 Boltzmann–Gibbs distribution 2801–2803, 2805
 Boltzmann kinetic equation 2808
 Boltzmann machine 5871, 5882
 Boltzmann semispace 7449
 Boltzmann, Ludwig Eduard 2860, 2863
 Boltzmann's ergodic hypothesis 957
 Boltzmann's statistical thermodynamics 4821
 Bolza problem 1502
 Bonabeau model 8400
 Bond angles 2829
 Bond-bending models 6558
 Bond-bending networks 2841
 Bond number 5581
 Bond percolation 6538, 6541
 Bonding affinity, differential 1331
 Bonding distance 6509
 Bonds 5407, 7822
 average per object 6509
 US treasury market 5407
- Book-to-market ratio 3391
- Boole 3352
 Boole, George 5477
- Boolean algebra of sets 6300
- Boolean circuits 905
- Boolean function 726
- Boolean grid 6492
- Boolean logic 417, 5477

- Boolean logic gate 9130
 Boolean networks 165, 516, 517, 727
 behaviors 1199
 complex GRN 1197
 dynamics 1199
 ensembles 1201
 GRN 1198
 model formalism 1197
 modelling real network dynamics 1199
 state transition maps 1199
 state transition table 1199
 Boolean operations 813
 Boom and bust dynamics 681
 Boosting 5321
 Bootstrap 3456, 3461, 7829
 Bootstrap distribution 8688
 Bootstrap percolation (BP) 609, 4507
 asymmetric 618
 modified 613
 probabilistic 622
 Bootstrap sample 8688
 Bootstrap test 5340, 6266
 Bootstrapping 5320
 Borda 9944
 Borda score 9948
 Borda's procedure 9948, 9952, 9955, 9960
 Borel property 6324
 Borel summability 6670
 Borel summation method 6740
 Borel theorem 6324
 Borel transform 6740
 Borel, E. 6324
 Born approximation 6742, 6743, 7919
 Born model 6556
 Born–Oppenheimer approximation 6689
 Born series 6742, 6743
 Borsuk–Ulam type theorem 7643
 Bose–Einstein and Fermi–Dirac statistics 7817, 7819
 Bose–Einstein condensation 9679
 Bose–Fermi mixture 9680
 Bose gas 9692
 Boson 9679
 Boson peak 2259
 Bosonic channel, quantum information transmission 7393
 Bosonization 9681
 Bosonization-refemionization 7347
 Bott, Elizabeth 8268
 Bottleneck 6487, 9356, 9369, 9421
 strength 9373
 Bottom-up
 approach 206, 207
 simulation 152
 Bound state 4966–4968, 7666, 8482
 Boundary conditions 66, 1398, 3169
 Dirichlet 1398
 Dirichlet type 1487
 Neumann 1398
 Neumann type 1487
 periodic boundary conditions 68
 Boundary of the Hill's region 6604, 6605
 Boundary region 7787
 Boundary singularity 5978
 Boundary to a concept 1792
 Boundary value problem 5931
 Bounded confidence 8393, 8397
 Bounded-depth quantum circuits 7197
 Bounded distortion, Markov map 6951
 Bounded domains, flow 5931
 Bounded function 3256
 Bounded-rationality 92, 209, 1595, 4097
 Bounded sum 4879
 Bounds on probability 4053
 Bourbaki school 3840
 Bourgas indices 4832, 4833
 Boussinesq 8114, 8117
 Boussinesq equation 6207, 6455, 8117, 8122, 8512, 9983, 9984, 9986, 9987
 Boussinesq systems 8117, 8122
 Bow shocks 22
 Bow tie structure 5269, 10060
 Bowen ball 3018
 Bowen–Ruelle–Sinai theorem 960
 Bowen's formula 6952
 Box counting 3926
 Box counting method 3709, 3883
 biological fractals 3788
 Box covering algorithms 3939
 compact-box-burning 3940
 greedy coloring algorithm 3939
 maximum-excluded-mass-burning 3941
 random box burning 3941
 Box dimension d_B 3926

- Box splines 594
 Boyd, John 8268
 BQP
 classical upper bounds 7184
 error reduction 7182
 subroutine theorem 7183
 BQP-hard 7111
 Bragg glass 2019
 Brain 282, 286, 1546, 1553, 3336, 3341, 3356–3358, 4896, 6099, 7992, 8003, 8004
 analogy 1553
 blood oxygen level dependent (BOLD) 1546
 computers, compared to 5882
 coordination dynamics 1553
 development 1902
 energy demands 1546
 function 8941
 informatics 4409
 information processing 1546
 pacemaker 627, 8947
 phase pictograms 1554
 plasticity 1902
 Brain size scaling, biological fractals 3784
 Brain's fiber tract, glioma growth 918
 Braatenberg vehicle 3682, 3689
 Branch-and-cut 6420
 Branch point withdrawal, polymeric fluid 6826
 Branch switching
 codimension 2 equilibria 6345
 flip points 6345
 homoclinic branch switching 6348
 Hopf points 6345
 simple branch points 6343
 Branched DNA 2105
 Branched polymers 6545, 6546, 6548
 Branching 2198
 Branching models 2561
 Branching patterns 4831
 Branching process 645, 647
 Branching structures, self-similar 3781
 Branes 1642, 1657
 Bravais lattice vector 692
 Breadth first search 8604
 Break-down thresholds 5081
 Breakdown in vehiculos traffic 9282
 Breaking, symmetry 3864
 Breakthrough 6574
 Breeder's equation 2908
 Breiger, Ronald 8269
 Breit Hamiltonian 7446
 Breit–Wigner 7290
 Breit–Wigner dip 7668
 Breit–Wigner resonances 7674
 Bribery 9960
 Bridges 8271, 8316
 Briegel 7257
 Brightness 6117
 Brine shrimp population 9018
 Brine solution 9822
 Brittle–ductile transition 657
 Brittle failure 9900
 Brittle tectonics 1218
 Broad transcription 2317
 Broadband body wave, earthquake 2666
 Broadband P-wave moment magnitude 2666
 Broadband record 2482
 Broadband vertical velocity seismogram 2667
 Brockett condition 3534
 Broken symmetry 6773, 7020
 Brokers 5395
 interdealer (IDB) 9565, 9567
 Brønsted–Evans–Polanyi relationship 1313
 Brown noise, biological fractals 3794
 Brownian dynamics 4218, 8742
 Brownian motion 2090, 3438, 3883, 5219, 5733, 5870, 6228, 7529, 8708, 8742
 biological fractals 3785
 single chain dynamics 6820
 Brownian particle 8776
 Brownian tension, polymer physics 6813
 Brownian trajectory, biological fractals 3785
 Brune's model 2583
 Brunsviga 5476
 BS 8790
 BSS 271, 281
 BSS model 279, 287
 Bubble cloud 6972
 Bubble dynamics 6957
 Bubble growth 6966
 Bubble nucleation 9791
 Bubble raft 5475
 Bubble sum 8580
 Bubbles 95, 2616, 9874
 Bucharest 2398

- Bucklin's procedure 9954, 9956
 Buckyball 9145
 Budget balancedness 5519, 5520
 Building block 2105
 of an artificial chemistry 328
 Buildings damaged by earthquakes
 Imperial County Services Building 2377
 7-story RC building in Van Nuys 2377
 Built-in self-test (BIST), applications 3240
 Bulk modulus 700
 bubble 6962
 effective 6962
 of a bubble 6962
 Bulk viscosity 2682, 4387
 Bullwhip effects 7849
 Bundle picture, mechanics 5495
 Bundle reduction
 cotangent 5498
 tangent and cotangent 5495
 Bundles
 Lagrange–Poincaré 5496
 principal 5500
 Burden's BCUT 2209
 Bureaucracy 8369, 8373
 Burgers equation 84, 85, 3372, 3649, 6230, 6455, 6467
 controllability 4815
 Burgers vector 2642
 Burgers vortex 3646
 Burning algorithm 8038
 Burridge–Knopoff 5024
 Burroughs, William S. 5476
 Burst 5022, 6107, 6108
 Burt, Ronald 8269, 8274
 Burton–Steif theorem for multidimensional subshifts 2985
 Business cycle 2745, 2746, 2748, 2750–2752, 2754, 2755, 7835
 asymmetry 5331, 5334, 5342, 5344, 5345
 Business dynamics 665
 growth-producing feedbacks 668, 684
 negative feedback (constraints to growth) 684
 negative feedback, constraints to growth 668
 Business ecosystems 7832
 Business strategy 665, 666, 8989
 resource-based view 669
 role of models 667
 scientific model applied to 667
 Business to business 7846
 Business to customer 7846
 Business units 7849
 Butterfly effect 3830, 4638
 Büttiker equation 7302
 BV 8789
 BZR model 5026
 Båth's Law 2560
 ‘go-game’ model 2560
 Griffiths' crack theory 2560
 Båth's law
 elastic rebound model 2560
- C**
- c-Contribution 5357
C. elegans brain, neural network 503
 C-Regularization 4092
 C-System 385, 402
 C-Value paradox 492
 C¹ subsolutions
 Hamilton–Jacobi equations 4559
 C4.5 1830
 decision tree 2165
 C₆₀ 694, 9145, 9146
 formation mechanism 9146
 CA 4240, 8875, 8879–8884, *see also* Cellular automata
 applications or examples 3235
 with three states 833
 CA classification
 Culik–Yu 760
 Kürka's 756
 Li–Packard 756
 Wolfram 756
 Cable-stayed bridges 2334
 Caccioppoli's inequality 1492
 Caenorhabditis elegans 9108
 Cahn–Hilliard equation 3636, 6231, 6457, 6467
 in three room dimensions 3637
 numerical solution 3637
 phase transition from liquid to gas 3636
 Cairns 3126
 Cairo 2398

- Calculus 3861
 of variations 6272, 6277
- Caldera collapse 9824
- Calibration 216, 5185, 6480, 9035
 function, regional 2494
 matrix 47
 parameter mismatch 60
- California 2398
- Calipher diameter, fracture networks 6514
- Caltagirone 8836
- CAM 532
- Camassa–Holm equation 87, 8118, 8512
- CAMD 2116
- Camera placement 2083
- Campania 2399
- Campbell–Baker–Hausdorff formula 1033
- Campi Flegrei Caldera, Italy 9868
 Monte Nuovo eruption 9868
- Canadian lynx 2719
- Canalization 1920
- Canalizing 604
- Canards 7605, 7610
- Cancellation 6666
- Cancer cells
 characteristic traits 913
 phenotypes 914
- Cancer diseases 914
- Cancer prediction and prognosis 2146
- Cannon, Walter 8267
- Canny 5472, 5473
- Canonical 1-form 2261
- Canonical anticommutation relations *see* CAR
- Canonical co-ordinates 2262
- Canonical coordinates 5446
- Canonical symplectic form 5445
- Canonical transformation 2261, 6769
- Cantor distribution 7011
- Cantor dust 2261, 4515
- Cantor family 2261, 4515
- Cantor set 2261, 3704, 4515, 6325
 biological fractals 3781
- Cantor stratification 4515
- Cantorus 409
- CAP *see* Chiral atom pair
- Cap-and-trade 9029
- Capability, organizational 7850, 7851
- Capacitive coupling 7354
- Capacitors 9780
- Capacity
 bottleneck 3149
 dimension 3879
 entanglement assisted 7393
 full 7846
 utilization 1967
- Capillary electrophoresis 5580
- Capillary number 9788
- Capillary waves 9977
- Capital 2284
- Capital asset pricing model (CAPM) 3391, 3443, 4126, 4128, 4972
- Capital intensive 2284
- Capitalist sector 2284
- Capitalist system 2284
- Capture probe 2110
- Car-following 9417
- Car traffic models 6776
- CAR, representations 3078
- Carathéodory condition 3266
- Caratheodory, Constantin 2860
- Carbon 1285, 3285, 3298, 3299
 nanotube 1284
 polyaniline 1287
 polypyrrole 1287
 single-walled carbon nanotubes (SWNTs) 1286
- Carbon allotrope 690
- Carbon cycle 9015
- Carbon market 9030, 9032
- Carbon nanotube field effect transistors 7480
- Carbon nanotubes 690, 1306, 9141, 9146, 9652
 beams 692, 698
 bundles 696, 700
 capped 694
 DWCNT 694, 697
 DWCNTs 691
 dynamic 696
 fluid flow 695
 gas adsorption 696
 mechanical properties 698
 MWCNT 691, 692, 694
 MWCNTs 698, 699
 static 696
 thermal properties 692, 700
- Carbonic anhydrase 2120

- Carcinogenesis 913
 metabolism and acidosis 915
- Carcinogenic activity 2182
- Cardiac physiology
 action potential 480
 electrocardiographic 479
 His-Purkinje conduction 480
 QRS complex 479
 spectral reserve 479
 sympathetic and parasympathetic
 stimulation 480
- Cardinal ratings 9954
- Cardinality of a fuzzy set
 fuzzy 4065
 nonfuzzy 4065
- Cardinality, fuzzy logic 3990
- Cardiovascular system, biological fractals 3784
- Cardy's formula 6529
- Carleman estimates 1490, 1493
- Carnot cycle 2818
- Carrier-envelope offset 6169
- Carrier in amorphous computing 265
- Carrier sense multiple access (CSMA) 2054
- Carrington, Peter 8269
- Carrying capacity 7843
- CART 1835
- Cartan structure equations 5504
- Cartan subalgebras 5448
- Cartesian product 4879
 couple 6301
 definition 6287
 nonsingular maps 3075
 of two fuzzy sets 4069
- Cascade algorithm 592
 multiwavelet 5844
- Cascade-correlation network 1821
- Cascade model, earthquake 2541
- Cascade operator 592
- Cascading 624
- Cascading failures 6058
- Case-based learning 5195
- Case-based reasoning 1792, 1803, 7762
- Case memory model 1804
- Case representation 1804
- Casimir function 2261
- Casimir operators 9648
- Castaing distribution 8533
- Cataclysmic variable 392
- Catalysis 3284, 3286, 3290, 3291, 3299
- Catalyst 1308, 1314, 1317, 1327, 1329, 7570
 activity 1314
 heterogeneous 1308
 homogeneous 1308
 selectivity 1309, 1317, 1329
 steam-reforming 1327
- Catalytic oxidation of carbon monoxide 7573, 7574
- Catalytic polymer, in artificial chemistry 334
- Catalyzed reactions 7576
- Catastrophe theory 1899, 4634, 8942
- Catch of synchronized flow 9374
- Catch-recapture sampling 8226
- Catchments 7598
- Categorical GrC model, eighth GrC model 4347
- Categorical unrelated, QSAR modeling 7073
- Category 173, 5352
 Lusternik–Schnirelman 6601
 mathematical systems 6289
- Category-exemplar model 1804
- Category of Turing machines 4347
- Cauchy distribution 3422
- Cauchy estimate 5071
- Cauchy–Euler approximate solution 3258
- Cauchy (or Lorentz) distribution 5221
- Cauchy–Peano theorem 3258, 6299
- Cauchy problem 3257, 6590, 6660
- Cauchy–Riemann equation 8717
- Caudate nucleus 8005
- Cauliflower
 anatomy, biological fractals 3782
 fractal dimension 3781
- Causal connection 7453
- Causal density 1434
- Causal dependency 5199
- Causal feature selection 5358
- Causal-loop diagrams 671, 673
- Causal loops 9043
- Causal mapping 7836
- Causal mechanisms: phase transitions 1639
- Causal processes
 oscillatory 4610, 4623
 time-lagged regression 4623
 time-series modeling 4627
- Causality 1901, 4609, 9069, 9070

- Cause map 1847, 1848, 1853, 1858–1860, 1862
 Cavity-QED, quantum computing 7245
 Cayley graph 783, 785
 Cayley tree 1403, 3856
 Cayley's formula 6668
 CBC algorithm 596
 CBC (coset by coset) algorithm 596
 CCC model 4127
 CCNOT gate, quantum computing 7379
 CCR *see* Convective constraint-release (CCR)
 CDF 10013, 10014, 10019, 10020
 Ceccherini-Silberstein, T. 780, 784, 786
 Čech–Stone compactification 3040
 Celestial calculation 5474
 Celestial mechanics 372, 399, 6673, 6681
 Celestial simulation 5472
 Cell adhesion molecules 532
 Cell adhesion proteins 7040
 Cell-cell adhesion, tumor cell migration 917
 Cell cycle 727
 Cell cycle control 729
 Cell differentiation 525, 529
 Cell-ECM adhesion, tumor cell migration 917
 Cell fate 1192, 1204
 Cell heterogeneity 1205
 Cell matrix 931, 5877
 Cell migration, ECM influence 915
 Cell model 6965
 Cell pattern formation 525
 Cell problem 6225
 Cell processes, tumor invasion 914
 Cell-scale models 515
 Cell-surface receptor 9751
 Cell types 1192, 1193
 attractors 1199, 1203
 Cells 923, 2698
 grid 6113
 place 6112
 Cellular array 3557
 Cellular automata (CA) 63, 65, 66, 71, 116, 164,
 188, 249, 752, 755, 760, 870, 892, 895, 901, 914,
 916, 928, 1056, 1064, 1065, 2562, 2980, 4240,
 4913, 5469, 5864, 5867, 6805, 7155, 7156, 7855,
 8047, 8067, 8421, 8428, 9159, 9415
 \mathbb{B} -bubble 2983
 \mathbb{B} -diamond 2983
 \mathbb{B} -poseexpansive 2985
 \mathbb{H} -mixing 2990
 \mathbb{P} -periodic 2985
 χ -eigenfunction 3004
 additive 2981
 affine 2981
 agent-based modeling 158, 186
 agent-based simulations 4917
 algebraic 2988
 algebraic \mathbb{Z}^D -action 2989
 asymptotic randomization 2993
 asymptotically randomizes 2993
 asynchronous 750
 attractor 2997
 average Lyapunov exponents 3006
 ballistic annihilation model 2992, 3000
 basin 2997
 basins of attraction 64
 binary Ledrappier 2993
 bipermutative 2981
 bounded-to-one 2983
 Burton–Steif measure 2985
 canonical factor 2986
 Cayley graph 911
 center 2998
 Cesàro average 2993
 Cesàro limit 2993
 character 2994, 3004
 cities 7966
 classical 7155, 7156
 collision rule 2991
 column shift 2986
 communication in 751
 comparison with Turing machines 746
 complete 752
 complete connections 2988
 complete history 2989, 3006
 complexity measures 748
 computationally universal 7156
 conditional measure 2985
 cone entropy 3007
 cone entropy of 3007
 connected 2999
 cyclic 2991
 cyclic addition and ballistic annihilation model 3001
 cylindrical 66

- d -dimensional measurable entropy density 3008
 d -dimensional topological entropy density 3008
 d -frame 3009
 d -linear form 3010
 d -plane 3008
defect 2991
densely recurrent 2999
densely recurrent subshift 2999
density one 3002
diffusive 2995
dimension 2986
Dirichlet boundary conditions 66
directional entropy of 3006
discrete spectrum 3004
dislocation 2991
domain 2991
domain boundary 2991
dual group 3004
eigencharacter 3004
eigenfunction 3003
eigenvalue 3003
elementary 66, 2991, 3001, 7156
embedding 910
emergent defect dynamics 3011
endomorphic 2988
entropy 9161, 9170
entropy geometry of 3008
entropy theory of 3004
equicontinuity 9170
equicontinuous 9160, 9161
ergodic 3002
essentially equals 2989
evolving 3234, 3236
expansive 2988, 3008, 9171
expansive component 3009
expansive subdynamics of 3008
extremely permutive 3003
full support 2993
game of life 4914
Garden of Eden 70–72, 9167
Garden-of-Eden problem 2983
generator 2987
group shift 2988
grouping 910
growth degree 2986
h-permutativity 2981
Haar measure 2988
harmonically mixing 2995
hexagonal lattice 911
history 909
hyperbolic plane 911
injective 2984, 9160, 9161, 9167
intrinsic universality 906
invariant measures of 2983
irreducible 2990
join 2993
lattice gas 4915
lean μ -attractor 2997
lean μ -center 2998
Ledrappier 2993
left-permutative 2981
left radius 2980
limit measures and other asymptotics 2993
limit set 2997, 9160
linear 64, 2981, 2993
local rule 2980
locally free 2995
Lyapunov exponent 3005, 4915
M-mixing 3002
machines 929
maxentropy measure 2984
(maximum) Lyapunov exponents 3005
measurable dynamics of 3002
measurable entropy 3005
measurable entropy dimension 3008
measure attractor 2999
measure of maximal entropy of 2984
measure-preserving dynamical system 3002
measure rigidity of 2988
minimal 2997, 2998
mixing and ergodicity of 3002
mixing of all orders 3002
modeling 848
 μ -attractor 2997
 μ -center 2998
 μ -limit set 2998
multimixing 3002
multiplicative 2996
mutually erasable pair 2983
nearest-neighbor XOR 2993
neighborhood 2980
nilpotent 9160, 9161, 9169

- null boundary conditions 66
 odd sofic shift 3001
 omega-limit set 2997
 one-sided 2980
 one-sided generator 2987
 P -periodic 2985
 particle 2991
 particle weight function 3002
 periodic 9171
 periodic measures of 2985
 permutative 2985
 permutive 2981
 phases 2991
 posexpansive 2986
 positively expansive 2986
 pre-injective 2984
 probabilistic 4916
 proper 2993
 quantum 911, 7155, 7156
 quantum-dot 7162
 quasi-invertible 3008
 radius 2981
 realm 2997
 rescaling 911
 reversible 911, 7156, 7157, 9160, 9161
 right-permutative 2981
 right radius 2980
 rule 64
 scalar coefficients 2981, 2993
 self-timed 8082
 sensitive 9170
 σ -minimal 2997
 signal subshift 2992
 simulation among 909
 small universal 909
 sofic 2984
 space complexity 746
 space-time diagram 902
 spectral group 3004
 spectral properties of 3003
 stable phases 2991
 state change complexity 750
 (strongly) mixing 3002
 subgroup shift 2988
 support 2995
 surjective 2983, 9160, 9161, 9167
 surjunctive 2984
 time 746
 toggle automata 2981
 topological entropy 3005
 topological entropy dimension 3008
 topologically ergodic 3002
 topologically transitive 3002
 totally ergodic 3002
 totally σ -ergodic 2989
 tree 752
 triangular lattices 911
 universality 909
 v-directional μ -entropy 3006
 v-directional topological entropy 3006
 vacuum configurations 3002
 velocity 2992
 weak* converges 2993
 weakly mixing 3002
 weakly σ -mixing 2997
 well 2998
 Cellular automata (CA) applications 64
 biological pattern formation 64
 cryptography 65
 deterministic pattern generation 65
 discrete reaction-diffusion systems 64
 disease processes 64
 disease transmission 64
 DNA sequences 64
 error correcting codes 65
 forest fires 64
 gene interactions 64
 growth and aggregation processes 64
 image processing 64
 language and pattern recognition 64
 parallel computers 64
 parallel multipliers 64
 prime number sieves 64
 pseudoassociative memory 65
 pseudoexhaustive pattern generation 65
 pseudorandom sequences 65
 signature analysis 65
 social interaction networks 64
 sorters 64
 spin exchange 64
 VLSI logic circuit design 65
 Cellular automaton (CA) 610, 755, 768, 800, 803,
 2982, 3158, 3233, 3234, 3538, 4497, 4739, 5024,

- 5438, 5874, 6772, 7156, 7548, 7679, 7680, 8028, 8375, 8869, 9250
additive 757
asynchronous 5877
in artificial chemistry 335
injective 7680
invertible 7680
modeling, tumor invasion 913
monotone 4497
neighborhood 3233, 3234
nilpotent 758
omnivorous 4500
partitioned 759, 7679, 7682
quantum dot 5875, 5876
reversible 758, 7679, 7681, 7710
self-reproducing 7694
self-timed 5879
solidification 4497
STCA 5879
supercritical 4500
surjective 758
synchronously 5877
threshold growth (TG) 4499
totalistic 4499
4-tuple definition 916
two-dimensional 3240
universal 7679
universal reversible 7683, 7689
with block rules 7679, 7681
Cellular automaton (CA) on a group 779, 781
G-equivariant 781
game of life 782
injective 783
Laplacian (discrete) 782, 786
linear 779, 780, 786
local defining map 779–781
Markov operator 787
memory set 779–781
minimal memory set 781
on \mathbb{Z}^2 780
pre-injective 779, 783, 786
surjective 782
Cellular computing 922, 923, 925, 8869, 8878, 9706
Cellular engineering 258
Cellular functions 720
Cellular maps 5701
Cellular models 6959
Cellular network 554, 2984, 5699
Cellular neural network 930
Cellular programming 3233
Cellular programming algorithm 3238
Cellular, hyperbolic 752
Cenozoic climate 13
Center 241, 2261, 4523
area 241
Center-focus problem 8640
Center manifold 392, 631, 6184, 6335, 6337
construction of 942
for infinite dimensional flows 947
in discrete dynamical 943
theory 8931
Center of gravity method 4884
Center-of-sets (COS), type-2 fuzzy logic 4016
Center-saddle bifurcation 2261, 4521
Centered moving average (CMA) method 3767
Central charge 8711
Central dogma 418
Central executive agent 1109
Central force 2829
model 6556
networks 2841
Central limit theorem 965, 2874, 2876, 3318, 6993, 8712
stochastic processes 3579
Central pattern generator (CPG) 1544, 1553
Central place theory 7957
Centrality 8237, 8271, 8275, 8309, 8311
betweenness 2731
closeness 2731
degree 2731
hierarchical criteria 4832
information descriptors 4832
patterns of complexity 4832
Centralization 8237, 8271, 8311
Centralizer 6656, 6766
Centroid method 4884
Centroid moment tensor 2488
solution 9593
Centroid type-2 fuzzy logic 4016
Cerebral cortex
neural 1557
phenomenological modeling 1557
CFL criterion 7896

CGE *see* Computable general equilibrium
 CGL equation 6470, 6471, 6474
 CGPS networks 4253
 Chacón maps 3061
 Chain 9230
 Chain components 9234
 Chain configuration change 6820
 Chain dynamics, single 6819
 Chain elasticity, polymer physics 6815
 Chain letters 3216
 Chain rule 1819
 differentialability 6298
 Chain, ideal non-interacting 6813
 Chalcogenide glasses 2832
 Chan-Vese model 10039
 Chan-Vese region-based active contour 10039
 Chan-Vese's active contour without edge 10039
 Chances, detection 3577
 Change
 environmental 7832
 in regime 9845
 in regime, statistically identifiable 9846
 of variables 6660
 Change order 1849
 Change-point models
 CUSUM 2573
 hidden Markov models 2574
 stress-shadowing 2573
 Change-point problems 9845
 Channel additivity conjecture 7393
 Channel modes 7664
 Channel superconductivity 8493
 Channels
 ionic 6101
 multiple use 7391
 Chants 2314
 Chaos 476, 1045, 2439, 2705, 3055, 3506, 4515,
 6132, 6134, 6428, 6637, 8028
 attractor 483
 controlled chaotic attractor 483
 correlation integral 484
 deterministic chaos 484
 low-dimensional chaotic 484
 noisy 3509
 probabilities 4907
 stochastic processes 3586
 strange attractors 483

Chaos and fractals, applications of 3829
 Chaos diagram 2423
 Chaos theory 8942
 Chaotic attractors 6629
 Chaotic behavior
 networks 1201
 of the solar system 6445
 Chaotic cities 7964
 Chaotic diffusion 389
 Chaotic dynamics 991, 2331, 2422
 statistical theory 6940
 Chaotic galactic orbit 414
 Chaotic hypothesis 989, 996, 999
 entropy production 6953
 Chaotic in the sense of Devaney 954
 Chaotic in the sense of Li and Yorke 955
 Chaotic motions 2423, 6442, 6447, 6663, 6666
 particles 5961
 Chaotic orbits 6428
 Chaotic phase 6775, 6776
 Chaotic region 6427
 Chaotic rotation 6446
 Chaotic systems 989, 1007
 Chaotic vibration 2422
 Chaoto-chaotic phase transitions 7995, 7998
 Chapman-Kolmogorov equation 5250, 9292
 stochastic processes 3580
 stochastic time series 3582
 Character-centric games 1346
 Characteristic
 height 6248
 level 6248
 Segré 6248
 Weyr's 6248
 Characteristic curves 9986
 Characteristic exponents 6629
 Characteristic factor 2949
 Characteristic frequency 6962
 earthquake 2664
 Characteristic function 1510–1512, 1520, 4061,
 4877, 6260
 Characteristic function form 1520
 Characteristic length scale 3881
 Characteristic multiplier 8637
 Characteristic path length 1431
 Characteristic polynomial 6836
 of the line graph 6848

- Characteristic time 6966
 Characteristic time scale 6957
 Characteristic vectors 9950
 Characterization, dynamic game 2220
 Charge density waves 1128, 6414, 7586, 9681
 Charged polymer 6817
 Charges, non-abelian 3876
 Chart of the nuclides 4825
 Chartist 96
 Cheap talk 1591, 8127
 Chebyshev inequality 6935
 Checkerboard lattice 6531
 Checkerboard model 125
 Checkerboarding 1697
 Chelungpu fault, Taiwan 4261
 Chemical bond 1308
 Chemical communication, acetaldehyde 483
 Chemical descriptor research, QSAR modeling 7074
 Chemical differential equation 329
 Chemical dimension 3702
 Chemical direction sensing 1365
 Chemical distance 3702, 3853
 sensing 1367
 Chemical evolution 338, 3280
 Chemical exclusive OR gate 1362
 Chemical frequency filter 1364
 Chemical gels 6545, 6547
 Chemical gradient diffusion 259
 Chemical graph theory 4827
 Chemical logic AND gate 1361
 Chemical logic OR gate 1361
 Chemical media 9705
 Chemical memory 1368
 Chemical neuron 1371
 Chemical potential 8580
 Chemical reactions 1307, 3365, 3368, 8940
 elementary step 1310
 mechanism 1308
 products 1308
 reactants 1308
 Chemical signal diode 1358
 Chemical structure, multiple descriptors 7072
 Chemical system, logic of 330
 Chemical three-valued logic 1373
 Chemical toxicology, QSAR models 7081
 Chemical vapor deposition method 691
 Chemical wave 886
 Chemical work, ecological systems 2698
 Chemisorption
 electronic effects 1319
 energy optimum 1314, 1316
 Hammer–Nørskov chemisorption model 1317
 Chemistry, matrix-multiplication 332
 ChemNet 2151
 Chemotaxis 720, 729, 3349
 Chen–Fliess series 1035, 1037
 Chenciner–Montgomery symmetry group 5973
 Chenciner–Venturelli Hip–Hop 5967
 Chern class 2261
 Chess 4139
 Chess games 2098
 Childhood 1903
 Chinese whispers 3217
 Chip-firing 8035
 Chiral atom pair (cAP) 7075
 Chiral factor, QSAR modeling 7075
 Chirality descriptors, QSAR modeling 7074
 Chirality indices, QSAR modeling 7075
 Chirality-sensitive atom pair descriptors, QSAR modeling 7075
 CHNC 8583
 Choice 7753, 7754, 7765
 Chomsky 1878, 1883
 Chomsky hierarchy 925
 language family 808
 Choquet integral 231
 Chordal SLE 8709, 8724
 Chords 6514
 Choreography
 n-body problem 5959–5961
 non-planar 5969
 Choreography symmetry 5973
 2-1-Choreography symmetry 5972
 Choroplasts 2698
 Chromatin 3894, 3896, 3917, 3918
 Chromatin immunoprecipitation (ChIP) 5661
 detection by micro array chip 3970
 Chromatin modification 1195, 1196
 epigenetic marks 1195
 Chromatographic separation 859
 Chronic illness 4577
 asthma 4577
 depression 4586

- diabetes 4577
 disability 4578
 disease management 4579
 heart failure 4578
 HIV/AIDS 4577
 prediabetes 4579
 premature mortality 4578
 prevention 4578
 risk factors 4583
- Chronological algebra 1028, 1029, 1033
 free 1033
- Chronological calculus 1028, 1029, 9105
- Chronological exponential 1031
- Chronological identity 1033
- Chronological logarithm 1032
- Chronological product 1033
- Chronology 3865
- Chronotopoi 9412
- Chuang 7256
- Church-Turing 271
- Church-Turing computable 3354
- Church-Turing thesis 287, 925, 7089, 8191
 quantum strong 7089, 7090, 7106, 7110
 strong 7089
- Cilia 1739, 1741, 1742, 1748, 1759–1761, 1769, 1770, 1774
- Cilium 1761
- CIMMSIM 127
- CImmSim 163
- Cinder cone 9821
- Cirac-Zoller gate, quantum computing 7233, 7234
- Cirac-Zoller scheme, controlled Z-gate 7233
- Circadian clock 729, 731
- Circadian rhythms 485
- Circle group 5309
- Circle method, biological fractals 3788
- Circuit 6031, 9946
 asynchronous 5868
 delay-insensitive 5869, 5878
 logspace uniform 6403
 quasi-delay-insensitive 5869
 self-timed 5869
 speed-independent 5869
 two-qubit 7380
- Circuit diagram, quantum Fourier transform 7241
- Circuit model of quantum 7090
- Circulant matrices 68, 69
 Fourier matrix 69
 generalized circulant matrices 74
 minimal annihilating polynomial 72
 properties of 69
- Circular and cumulative causation 8996
- Circular causality 1538, 2853, 4897
- Circular crack 2591
- Circular ensembles 7507
- Circular fault 2590
- Circular orbits 6436, 6447
- Circularity 4898
- Circum-Antarctic seaways 13
- Cis-regulatory elements 9094
- Cities and complexity 7954
- City 1047, 7953
 as representation of society 7958
 game 7974
 planning 7953
 size distribution 1049, 1051
- Civilization 3281
- C^k Conjugacy 3096
- $C^{k,l,p,r}$ Locally rigid 3102
- Claim 1859, 1861, 1862
- Clarke mechanism 5514, 5519
- Class
 basic 6246
 distinguished 6248
 final 6246
 initial 6246
 of non-stationarity 1618
 operator 4415, 4420
 structure 8184
- Classical augmented infinities 6289
- Classical categories 7954
- Classical computational complexity 7120, 7399
- Classical control engineering 8952
- Classical control theory 8954
- Classical electron oscillator 6121
- Classical information transmission quantum channels 7392
- Classical integrable systems 5081
- Classical-map hyper-netted chain 8576, 8582, 8583
- Classical master and Langevin equations 3365
- Classical MD simulation 694

- Classical MD simulation method 692
 canonical ensembles 695
 constant-temperature 695
 equilibrium 700
 non-equilibrium 700
- Classical Monte Carlo simulation method 692
- Classical planning 5189
 problem 5192
- Classical solution 6218
- Classical subsolution 6220
- Classification 756, 760, 764, 1826, 1904, 4362, 4401, 7753–7755, 8243
 and regression trees (CART) 2167
 degree-based 764
 methods 1799
 modeling 7073
 system 7803
 theorem 713
- Classifier 1791, 1826
- Clausius 2860
- Clean value, reduction theorem 5489
- Cleaning 3683, 3690
- Clear Lake region 7845
- Clearing and settlement 5407
- Clebsch–Gordan transformation 7113
- CLF *see* Contour length fluctuation (CLF)
- Client–therapist interaction 7996
- Client, mobile system 5606
- Climate 7592
 climate simulations 7594
 key parameters 1096
 records 3713
- Climate change 1071, 7601
 abrupt 1097
 human-induced 7845
 impact on human health 1095–1097, 1099
 impacts on plants 1102
 indirect health effects caused 1101
 migration 1102
 natural 1097
 vector-borne tropical infectious diseases 1101
- Climate feedbacks 9015
- Climate modeling 3713, 9023
- Climate simulation 2
- Climate statistics 3
- Climate time scales 1
- Climate variability 6
- Clinical psychology 7991, 8006, 8947
- CLIQUE 5058
- Clique percolation 1156
- Cliques 8253, 8267, 8271, 8275, 8287
- Clock 5477, 8200, 8207
 resonant 5868, 5870
- Clock gating 5868
- Clogging 3144
- Clonal selection 4780
- CLONALG – clonal selection algorithm 2128
- Concurry 3128
- Cloning 420
- Close binary systems 392
- Close encounter 8696
- Closed loop 7054
- Closed-loop control 632
- Closed loop equation 1504
- Closed-loop thinking 4565
- Closed-world assumption 5191
- Closeness 8271
 centrality 8287
- Closing CA 9253
- Closing conditions 3100
- Closure 8235
 of sets 338
 problem 3649
 properties 800, 813
 syntactic and semantic 341
- Clouds 3700
- CLR *see* Common language runtime
- Club networks 6031
- Club of Rome 8409
- Clubs 4097
- Cluster 610, 1598, 3849, 6382, 6538, 6541, 6542, 6566, 6669, 6784, 7822, 8247
 average number 1598
 density of sites in the infinite cluster 1598
 finite 3708, 3849, 3850
 fractal dimension 1599
 in amorphous computing 266
 infinite 3708, 3849, 3850
 mean cluster size 1598
 spanning 610, 3850
- Cluster analysis 1235, 1991, 9851
 distance metric 9851
 hierarchical clustering 1236

- model-based hierarchical clustering 1236
 statistic 9851
 Cluster assignment variable 505
 Cluster expansions 8595
 Cluster state 631, 632, 635, 7257
 Cluster variables 631
 Clustered samples
 sample stratification 5569
 social interactions 5570
 spatial dependence 5570
 survey sampling 5570
 Clustering 730, 1232, 1431, 1778, 2351, 3772, 4362, 4401, 4489, 4663, 5415, 6005, 6053, 8247, 8674
 algorithms 2356
 coefficient 575, 725, 730, 2531, 2534, 2535, 2537, 4490, 5659, 6053, 8235, 8254, 8284, 8330, 10061
 effect 7504
 functional network 507
 network density 6053
 of extreme events 3713
 procedure 8261
 weighted 6057
 CMOS 9706
 CMT 9587
 Cnoidal wave 8113, 8116, 8118, 8123, 9970, 9988, 9989
 CNOT-gate, quantum computing 7236
 CNOT quantum gate, truth table 7234
 CNOT-wavepacket gate, quantum computing 7236
 Co-sets 5546, 5548
 CO₂-concentration, elevated 1102
 Coadjoint orbit bundles 5501
 Coadjoint orbits 5447, 5487
 as symplectic reduced spaces 5490
 cotangent bundle reduction 5501
 Coalescence 9148, 9149
 Coalition 1509–1511, 1514, 1515, 1520
 losing 1522
 minimal blocking 1522
 minimal winning 1522
 of constraints 1559
 winning 1522
 Coarea formula 10038
 Coarse coding 282, 3344, 3351
 Coarse-grained 3929, 7034
 Coarse-grained dissipation 8529, 8549
 Coarse grained observation 993
 Coarse grained techniques 5917
 Coarse graining 1006, 2368, 3367, 8711
 Coarsening 6467, 6472
 Coastline 3700
 Coating 1296
 COBE/CMB bound 1636
 Coboundary cocycle 3067
 Cobweb model 8994
 Cocycle identity 5485
 Cocycle superrigidity 3104
 Cocycles 3099, 8555
 affine 8560
 dynamical systems 3067
 momentum 5485
 nil 8560
 orbit classification 3068
 Rokhlin 8563
 weak equivalence 3067
 COD 5061
 Coda attenuation factor 7915
 Coda interferometry 7927
 Coda waves 7914
 Code
 mobile 5606
 obfuscation 5612
 on demand 5607
 signing 5612
 Codebook 1782
 Codimension 703, 704, 713, 714
 codim(f) 713
 Coding DNA, fractal features 3797
 Coefficient
 assortativity 6049
 clustering 6049
 Coercivity 6601
 Coevolution 3233, 3239, 4136, 8242, 8367, 8370
 applications 3240
 host-parasite 3239
 of networks and behavior 6008
 Coexistence 6626, 6631, 6633
 CogCity (cognitive city) 7975, 7979
 Cognition 1112, 1113, 1225, 1899, 1901, 2243
 connectionist approach 1114

- hybrid approach 1116
symbolic approach 1113
- Cognitive 2845
Cognitive agents *see* Deliberative agents, 1338
Cognitive architectures 1112
Cartesian theater 1109, 1120
connectionist 1112
global workspace 1109, 1120
hybrid 1112
intelligent machine architecture 1121
symbolic 1112
- Cognitive development 1903
Cognitive dissonance 2244
Cognitive dynamics 7543, 9415
filtering beliefs 7543
filtering goals 7544
- Cognitive immunology 4782
Cognitive map 1853, 1859, 4898
Cognitive processes 8406
Cognitive robotics 1110, 1117, 1225
anthropomorphic robotics 1118
Braitenberg vehicles 1118
cognitive robot definition 1110
COGRIC 1110
ethics 1124
morphological computation 1118
- Cognitive science 1347, 4403
Cognitive state 9415
Cognitive system 1889
Cogwheel 5476
Cohen, L.J. 6928
Coherence 1437, 2247, 3216, 3218, 6117
quantum computing 7238
Coherency condition 431
Coherent (effective) potential 8596
Coherent (laser) light 6388, 6390, 6391, 6395, 6396
Coherent optical wavefront 6390, 6394, 6398
Coherent states 3352, 3353, 3367
Coherent structures 394, 8523, 8526
Alfvénic 8527
Coherent systems 6391
Coherent type I motif 563
Coherent wavefronts 6395
Cohesive resistance 4627
collective resistance 4614
resistance 4626
- resistant cohesion 4615
resistive groups 4626
- Cohesive subgroup 8234, 8287
Cohomological functional equation 5458
Coil-collapse transition
block co-polymer 6830
polymer physics 6816
Coiled coil 9752
Coincidence detector 1364
Cointegration 2758, 3444
Cointension, fuzzy logic 3996, 4004
Cointensive precision, fuzzy logic 3994
Colbran, Charles Xavier Thomas de 5476
Collaboration 9098
Collaborative cross 9118
Collapse
bubble 6956
of a bubble 6969, 6970
Collapse of the wave-function 7173
Collective behavior 1282, 6492
Collective choice problem 9935
Collective dynamics 6476
Collective event 5022
Collective excitations 1272
Collective firing 631
Collective intelligence 1281, 6483
Collective level of description 5721
Collective motion 610
Collective objects 4921
Collective phenomenon 6486
Collective pinning 2032
Collective transport 1127
Collective variables 1538, 1542
College admissions problem 4097
Collision-based reaction-diffusion computing 9720
Collision term 880
Collisional
cooling 4381
system 8696
Collisions 879, 880, 9413
asymptotic estimates 5979
between two or more particles 5961, 5978
explicitly simulated 330
of molecules 327
Collisions instants, isolatedness 5979
Colloid aggregation 3721

- Colloidal suspensions 4215
 Colloids 2025
 Colony 8883
 Comb model 310, 313
 Combination 5741
 in amorphous computing 266
 Combinatorial explosion 8736
 Combinatorial generator 1891
 Combinatorial library 2117
 Combinatorial optimization problem 9950
 Combinatorial QSAR 7079
 methodology, flow chart 7079
 Combinatorial space-time 8844
 Combinatorics 3055
 Comfort control 4885
 Commensurate density 9680
 Commercial 2284
 Commercial customers 5409
 Commodity cycle models 678
 Common agency 6983
 Common knowledge 427
 Common language runtime (CLR) 5607
 Common-pool resources 4864
 Common prior 428, 429, 435
 Common prior assumption 1592
 Common structure semigroup 8301
 Common value 9935, 9937, 9940, 9941
 Communicate 6245
 Communicating finite state machines 165
 Communication 1961, 3109, 3111, 3136, 4104,
 6492
 about intentions 8127
 action statement 3117
 barrier to change 3125
 between particles 267
 channel, quantum information processing
 7369
 complexity 7716
 core goal 3117
 electronic mass media 3114
 equilibrium 1588
 indigenous community 3111
 information flow 3117
 institutional barrier 3125
 integrating theory 3119
 language 3117
 make the threat real 3119
 mechanism, amorphous computing 263
 media 3117, 3119
 media support 3115
 medium and message 3114
 meteorological knowledge 3117
 non-English speaking household 3122
 paradigm shift 3126
 phone tree disaster warning model 3122
 policy and laws 3116
 politics 3119
 precautionary principle 3118
 risk communication theory 3132
 safety group 3126
 safety triangle 3111, 3123, 3126, 3138
 simulation 3114
 siren 3119
 target audience 3117
 web 3124
 world view 3117
 Community 1141, 3110, 3131, 3135, 3136
 awareness 3110
 cultural knowledge base 3136
 dispersal limited 2706
 effect 529–531
 empowerment 3111, 3138
 hierarchy 1145
 immigration rate 2707
 indigenous 3120
 passivity to partnerships 3116
 personal contact 3124
 resilience 3114
 safety group 3130
 self-help 3131
 seven steps to community safety 3124
 Community definition 1143
 global 1144
 local 1144
 Community structure 1142, 2741, 2903, 6054,
 8915, 10066
 modularity 10066
 non-overlapping 6054
 overlapping 6056
 species abundance 2903
 species abundance distributions 2913
 species richness 2903
 Commutative-group, definition 6288
 Commutative-semigroup, definition 6288

- Commutator 4590
 Compact 5029
 Compact visitation 312
 Compactification 3869
 Compaction length 2685
 Compactivity 5008
 Compacton 81, 84, 88, 90, 8458, 8506
 Comparative evaluation of prediction algorithms (CoEPrA) 2191
 Comparative genomics 4173
 Comparative molecular field analysis (CoMFA) 2209
 Comparator 278, 280
 Comparison principle 6221, 6222, 6224
 Compartmentalization 8382
 Compartments 2714
 Compatibility condition 4963
 Competing phase 9680
 Competition 8040, 8771, 9701
 imperfect 7837
 model 874
 Competitive advantage 7832
 sustainable 7851
 Competitive equilibrium 1512
 Competitive learning 4873
 Competitive market 4108
 Competitive (Walrasian) equilibrium 4108
 Complement 4877, 4878
 of a fuzzy set 4066
 Complementary 1539
 Complementary cumulative distribution 7011
 Complementary nature 1559
 Complementation 4148
 Complete basis 5462
 Complete graph 8392
 Complete integrability 6767
 Completely dissipative 5459
 Completely integrable 5447, 8113, 8114, 8641
 Completely integrable equations 8113, 8114
 Completely revealing strategy 7631
 Complex 7837
 Complex adaptive system 1877
 Complex amplitude 9916
 Complex behavior 5024
 Complex data 4342
 Complex dataset, QSAR 7072
 Complex dynamics 2971, 3020
 Complex energy landscapes 7586
 Complex frequencies 9916
 Complex Ginzburg–Landau (CGL) equation 6469
 Complex GRN 1180, 1181
 Boolean networks 1197
 Complex instability 6435
 Complex natural systems 554
 Complex networks 1191, 1244
 subgraphs in 5694
 Complex organizations
 management 4564
 planning 4565
 Complex social behavior 7579
 Complex social system 6492
 Complex systems 160, 235, 477, 2857, 3268, 4900, 6049, 7009, 7019, 8711, 8928, 8946
 approach 477
 as networks 5692
 non-Hamilton 1624
 Complex topology polymer 6818
 Complex wavelet 8675
 Complexity 1424, 1805, 1980, 3276, 3859, 4098, 4101, 4821, 5740, 7064, 7089, 8040, 8711, 8943, 9105
 algorithmic 5206, 5207, 5213
 biochemical 1304
 biological 489
 biological sequence 494
 bounds 4104
 classes 9955
 computational 5740, 7089
 computational chemistry 1302
 conditions for 180
 costs 4112
 definition of 8372
 ergodic theory 6944
 evolution 505
 functional 491
 genome sequence 492
 in biological systems 5693
 in scale 3576
 in time 3575
 measures 1429, 4822, 6398, 6401, 7713
 mechanisms 8368, 8371
 metric 3277
 modeling 5377–5379, 5382, 5383, 5387
 molecular 498, 1302

- of computation 4101
 of contracting 4112
 of implementation 4101
 polylogarithmic 6403
 polynomial 6402
 QSAR based 7071
 query 7089, 7091
 reduction 4899
 research 8007
 resonance diagram 7999, 8000, 8003
 sample 5206, 5207, 5211–5213, 5217
 science (CS) 177, 9412
 stochastic processes 3574, 3575, 3583,
 3586–3589, 3591–3593, 4513
 structural 491
 theory 288
 time 6398
 topological 1302
 Compliant motion planning 5473
 Complicated 7837
 Component separation 1719
 morphological component analysis 1733
 Components 4492, 6044, 6497, 8271, 8275
 giant connected 4492
 strong 8250
 weak 8250
 Componentwise egalitarian 6045
 Composite error 2772
 Composite-fermion 8586
 Composition 4880
 of relations 8293, 8295
 operator 4871
 Compositional complexity
 DNA sequence 495
 Compositional rule of inference 4070, 4875, 4882
 Compositional strand asymmetry 3894
 Compositionality 5286
 Compressed sensing 10044
 Compressibility 6960
 Compressible 1719
 Compression 699, 10032
 Compressive sampling 10044
 Compton scattering 6664
 Computability theory 925
 Computable 5467
 Computable general equilibrium (CGE) 177
 Computation 285
 continuous 272, 276
 discrete 272, 276
 mobile 5605
 quantum information processing 7365
 reversible 5869
 Computation at the edge of chaos 3237
 Computation in CAs 3235
 Computation of local travel times 9184
 Computation theory 3234
 Computation-universality 7694, 7697, 7705, 7709
 Computation via CA particles 3237
 Computational agent
 BDI agents 7542
 classifier systems 7538
 genetic algorithms 7537
 reinforcement learning 7538
 strong 7536
 weak 7536
 Computational biology 923, 1227, 9094
 Computational chemical toxicology, QSAR models
 7081
 Computational complexity 925, 7119, 8603, 8605
 Computational complexity class 5468
 Computational complexity theory 6402
 Computational equivalence 763
 Computational intelligence 4776
 Computational maps 3341, 3350, 3353
 Computational mechanics 4599
 Computational model 4783
 Computational particle 259
 Computational problem 5468
 Computational processes, agents as 188
 Computational task 3235
 Computational web intelligence 4408
 Computer-aided drug design (CADD) 2141,
 2161, 2210, 2211
 Computer-assisted 6682
 Computer-assisted proof 5082, 5088
 Computer game(s) 1335
 Computer generated imagery (CGI) 1336
 Computer graphics 1335
 Computer science 417, 923, 4216, 4894
 Computer security 4342
 discretionary access control model 4343

- Computer simulation [4217](#), [7034](#), [7992](#), [8375](#), [8421](#), [8427](#), [8428](#), [8432](#), [9073](#), [9074](#), *see also* Simulation
as method [9073](#)
of cultural evolution [3214](#)
- Computer systems, mobile [5605](#)
- Computer vision, applications [3240](#)
- Computerized tomographie
backprojection [9178](#)
iterative solutions [9178](#)
- Computerized tomography
analytical solutions [9175](#)
filtered projection [9177](#)
historical overview [9173](#)
parallel projection [9174](#)
- Computing
amorphous [257](#)
noise driven [5870](#)
paintable [262](#)
pervasive [269](#)
reversible [5875](#)
- Computing cell, growth [262](#)
- Computing cube [926](#)
- Computing predecessor states [73](#)
- Computing scenarios, process of [7850](#)
- Computing with solitons [1376](#)
- Computing with words (CW) [3986](#), [4005](#), [4071](#), [4362](#)
- Comte, Auguste [8380](#)
- Concavification [7634](#)
- Concavity [2861](#)
- Concentration control coefficients [559](#)
- Concentration expansion [8593](#)
- Concentric KdV equation [9995](#)
- Concept approximation [4352](#), [4359](#)
- Concept approximation space [4352](#)
- Concept dependent granulation [4428](#)
- Concept detection [5742](#)
- Concept lattice [8295](#)
- Conceptual model [15](#)
- Conceptual structure, fuzzy logic [3988](#)
- Conceptualization, context for [7850](#)
- CONCOR [8359](#)
- Concurrence relation, non standard analysis [6304](#)
- Concurrent Poisson process [6995](#)
- Concurrent relationship [4666](#)
- Condensation [4492](#), [8250](#)
- Condition
for optimality [1488](#), [1503](#)
necessary [1502](#)
Palais–Smale [6607](#)
weighted Palais–Smale [6607](#)
- Condition A [6765](#)
- Condition E [5844](#)
- Condition ω [6765](#)
- Condition $\omega^\#$ [6767](#)
- Condition $S(\theta)$ [3532](#)
- Conditional complexity [493](#)
- Conditional entropy [495](#)
- Conditional expectation [5463](#)
- Conditional independence [2783](#)
- Conditional Kolmogorov complexity [493](#)
- Conditional measures [5463](#)
- Conditional phase shifter [1017](#)
- Conditional possibility distribution [6933](#)
- Conditional probability [495](#)
of a fuzzy event [4072](#)
- Conditional variance [3440](#)
- Conditionally periodic [2262](#), [4516](#)
- Condorcet [9944](#)
- Condorcet jury theorem [9934](#), [9937](#), [9940](#)
- Condorcet–Kemeny problem [9949](#), [9956](#)
- Condorcet winner [9943](#), [9944](#), [9949](#)
- Condorcet’s paradox [9935](#), [9937](#)
- Condorcet’s procedure [9956](#)
- Conductance [8600](#)
- Conductance fluctuations [7172](#)
- Conductance matrix [3740](#)
spanning tree polynomial [3741](#)
- Conductivity [6535](#), [7826](#)
- Conductivity exponent [1407](#), [1410](#), [2831](#), [3889](#)
- Conductivity (t) and superconductivity (s)
exponents [1411](#)
- Conduit [9763](#), [9766](#), [9785](#), [9881](#)
- Cone field [4728](#)
- Confidence [5206](#), [5207](#), [5211](#), [5212](#), [5216](#)
- Confidence matrix [8397](#)
- Configurable logic blocks [930](#)
- Configuration
almost equal [783](#)
almost periodic [761](#)
finite support [761](#)
initial [782](#)
periodic [761](#), [785](#)

- recursive 761
- rich 250
- sufficient 4498
- support of a 786
- Configuration model 6052
- Configuration reachability 169
- Configuration space 5784, 6589, 6597, 6600, 6602–6604
- Configuration space and the shift alphabet 2980
- Cantor space 2980
- configuration space 2980
- configurations 2980
- shift map 2980
- Configurational averaging 8594
- Configurational entropy 4213, 5034
- Configurational information 4827
- Confinement potential 7310
 - electrostatic confinement potential 7313
- Confining potential 8576
- Confirmation 9067
- Conflict
 - sociopolitical instability 4622
 - spatial population structure 4615
- Conflict monitoring system 8005
- Confluence 761
- Conformal field theory 3731, 7347, 8711, 8713, 8726
- Conformal invariance 8709, 8713, 8717, 8718, 8722, 8728
- Conformal maps 8713, 8717
 - Hastings–Levitov scheme 3723
 - Laurent coefficients 3730
- Conformal property 8721
- Conformal repeller 6952
- Conformal transformation 8709, 8713, 8717, 8723
- Conformist pressure 3209
- Conformity 3216, 3218
- Confusion
 - conceptual 7836
 - operational 7836
- Confusion matrix 1998
- Congested patterns 9408
- Congested traffic 9283, 9302, 9355
- Congestion 6059, 9417
 - congestion-awareness 6059
 - congestion factor 6060
 - jamming transition 6059
- Congestion games 3180, 3187
- Conical intersection 6692
- Conjecture
 - Littlewood's 3030, 3033
 - Oppenheim 3033
 - Oppenheim conjecture 3030
- Conjugacy 3096
- Conjugacy class 6659
- Conjugate co-ordinates 2262
- Conjugate gradient 5755
- Conjugate Hamiltonian 4544
- Conjugate pairing rule 1003
- Conjugation function 1934
- Conjunction 4879
- Connected graphs 5268
- Connected hole density 619
- Connectedness 1889, 1905
 - length 1599
- Connecting orbits 6347
- Connectionism 924
- Connectionist AI 1109
- Connectionist approach
 - connectionist cognitive machine architecture 1115
 - synthetic neural modeling 1116
- Connectionist learning 1822
- Connections 4830
 - synaptic 639, 641
- Connective stability 2053
- Connectivity 1449, 2737, 6566
 - geological fractures 6505
 - pathological 628, 629
- Connectivity graph 724
- Connectivity index 6838
- Connectivity matrix 6837
- Connectivity theorems 560
- Conscious 1556
- Consciousness 1424, 4893, 8184
 - conscious content 1425
 - conscious level 1425
 - discrimination 1425
 - hard problem 1439
 - higher-order consciousness 1425
 - primary consciousness 1425

- Consensus 7725, 7839
 formation 8387, 8389, 8397
 prediction, QSAR models 7083
 QSAR models 7082
 time 8387
- Consequences, profound 7849
- Consequent 4871
- Conservation 1904
- Conservation equation 5577
- Conservation laws 882, 4382, 4713
 n-body problem 5979
- Conservation of mass 5541
- Conservation understanding 1898
- Conservative 5459
- Conservative and progressive forces 1896
- Conserved moieties 558
- Conserved quantities 4715, 6182
- Consistency 5183
 assumption 435, 440
 relation 5744
- Consistent algorithm 5212, 5213
- Consistent belief 435
- Consistent BL-subspace 437
- Consistent state of the world 436
- Consonant 2310
- Constant
 cosmological 3868
 of motion 6182
- Constant proportion portfolio insurance (CPPI) 94
- Constant relative risk aversion (CRRA) 96
- Constitutive equation 4382, 4383
 fluids 5929
 liquids 5929
- Constitutive relationship 2681
- Constrained Pareto efficiency 6041
- Constrained variable 3998
- Constraint-based analysis 520
- Constraint-based modeling 521, 5541, 5545
- Constraint-based modeling approaches 5537
- Constraint-based planning 1347
- Constraint counting 2835
- Constraint release (CR), entangled polymer dynamics 6824
- Constraints 8239
 fuzzy logic 3997, 3998
 on multiple levels 1558
- Constructibility 809
- Construction universality 5879
- Constructionism 207
- Constructive system 8040
- Consumer sovereignty 1671
- Contact 5012
- Contact angle 5584
 hysteresis 5583
- Contact map 7035
- Contact tracing 4667
- Contagion 8307, 8309, 8312–8315, 8317
- Containment behavior 2057
- Contemporaneously exogenous 2772
- CONTENT 6349
- Context data 4871
- Contextual independence 1867
- Contingency matrix 1865
- Contingency table 1865, 2445
 attribute 1865
 conditional probability 1867
 determinantal divisor 1869
 elementary divisor 1870
 elementary transformation 1870
 rank 1866, 1867
 rough set 1865
 statistical independence 1867
 subdeterminant 1868
 submatrix 1868
- Continuation 6332, 6590, 6608
 Moore–Penrose 6334
 of an orbit 6594
 pseudo-arc length 6333
 strategies 4100
- Continued fraction 3042
 expansion 5461
- Continuity 1683, 1898, 1899
- Continuity equation 881, 3614, 5576, 8106, 8108, 9971
- Continuous deterministic 555
- Continuous feedback 8621
- Continuous function 3256, 6295
- Continuous problem 7119
- Continuous space machine (CSM) 6396
 C_2 6400
- Continuous spectrum 7165
- Continuous stochastic process 6228
- Continuous t-norm 4416

- Continuous time [277](#), [3524](#)
 processes [3445](#)
 random walk [5222](#)
 stochastic volatility models [8786](#)
 SV jump-diffusion model, quadratic return variation [8787](#)
- Continuous wavelet transform [6353](#), [8671](#)
- Continuum [5576](#), [6567](#), [7666](#)
 asymmetric [2641](#)
 hypothesis [9728](#), [9971](#)
 limit [3365](#), [3367](#), [8709](#), [8718](#)
 mechanics [698](#)
 media approximation [8588](#)
 percolation [6507](#), [6508](#)
 robot [1225](#), [1475](#)–[1477](#), [1479](#), [1483](#)
 surface [1477](#)
 thresholds [6508](#)
- Contour length fluctuation (CLF), entangled polymer dynamics [6824](#)
- Contour of a convex image [4747](#)
- Contraceptive [8309](#)
- Contraction [2936](#), [3861](#), [8247](#)
 principle [5300](#)
- Contracts [6977](#)
 incentive [6978](#)
 long-term [6982](#)
 menu of [6984](#)
 short-term [6982](#)
- Contrarians [8388](#)
- Contrast enhancement [1719](#)
- Control [1486](#), [1488](#), [4671](#), [8617](#)
 boundary [1505](#)
 deterministic [6219](#)
 hierarchical [6068](#)
 hybrid [4671](#), [4674](#), [4678](#)
 juggling [4675](#)
 linear convex [1505](#)
 linear quadratic [1504](#)
 mobile robot [4690](#)
 networked [4679](#)
 optimal [1488](#), [1502](#)
 piecewise constant [6374](#)
 positional [1488](#), [1502](#)
 reset [4680](#)
 sample-and-hold [4678](#)
 stochastic [6219](#), [6220](#)
- supervisors [4684](#)
 temperature [4672](#)
- Control coefficients [559](#)
 Control function [1488](#)
 Control input [3524](#)
 Control-Lyapunov function [8624](#)
 Control node [155](#)
 Control parameter [1538](#), [5718](#), [7994](#), [8000](#), [8001](#), [8004](#), [8430](#), [8431](#), [8927](#), [8928](#)
 internal parameter [8430](#), [8432](#)
 internal states [8423](#), [8430](#), [8431](#)
- Control parameter α [5590](#)
- Control qubit
 CNOT-gate [7236](#)
- Control space [713](#), [1488](#)
- Control surface [4887](#)
- Control system [284](#), [290](#), [3524](#), [4806](#)
 trajectories [5440](#)
- Control systems [289](#)
 optimal [5441](#)
 reachable sets [5440](#)
- Control theorems [560](#)
- Control theory [1542](#), [9014](#)
- Controllability [1027](#), [3524](#), [4811](#), [6372](#), [8619](#), [9104](#)
 approximate [1488](#), [4809](#)
 Burgers equation [4815](#)
 exact [4811](#)
 heat equation [4809](#)
 linear partial differential equations [4812](#)
 linear systems [4807](#)
 nonlinear systems [4814](#)
 one-dimensional heat equation [4813](#)
 regional null [1506](#)
 return method [4816](#)
 semilinear wave equation [4814](#)
 stabilization and optimal control [6217](#)
 wave equation [4808](#)
 zero [4811](#)
- Controllability Gramian [3527](#)
- Controllability to zero [4810](#)
- Controllability/observability duality [4811](#), [4812](#)
- Controllable [3526](#), [3531](#)
- Controllable along a trajectory [3529](#)
- Controlled interventions [7062](#)
- Controlled Lagrangians [2015](#)
- Controlled-NOT, CNOT [7329](#)
- Controlled-sign [7254](#)

- Controlled Z-gate, Cirac–Zoller scheme 7233
 Controller, interval type-2 fuzzy logic systems 4015
 Controlling feedback 2284
 Convective constraint-release (CCR) 6824
 Convenience samples 8225
 Convergence 6177, 6189, 6761
 trajectories 1203
 Convergent evolution 5662
 Conversion relations 2476
 45-Convex 4747
 Convex combination, fuzzy logic 3992
 Convex conditions 7429
 Convex linear combinations 7429
 Convex space 5536
 Convolution 3345
 Conway JH 782
 Conway’s game of life 5439, 8030
 Conway’s life rule 8837
 Cooling 4381
 vibrational 7226
 Cooper pair 9701
 Cooperation 6477, 8040, 8382
 altruism 4616
 enforcement norms 4618
 evolution of 5679
 free-riders 4624
 punishment 4616
 reciprocity, reciprocators 4617
 self-interest 4625
 selfishness 4616
 Cooperative
 grabbing 3691, 3692
 transport 3683, 3684, 3691, 3692
 Cooperative control 7713
 Cooperative cost game 1663
 sub-additivity 1663
 Cooperative effect 9424
 Cooperative game 1509, 1511, 1663
 Cooperative game theory 1509, 1510, 4095
 Cooperative outcome 4102
 Cooperative phenomena 3361
 Coordinate
 fractal 3861
 in amorphous computing 265
 Coordinate transformation 712
 Coordinated path 5786
 Coordination 1539, 6477
 Coordination dynamics 1438, 1537, 5719
 applications of 1558
 dynamical rules 1544
 nonlinear interaction 1544
 patterns of coordination 1547
 switching 1544
 therapy 1558
 understanding 1544
 Coordination games 3196
 Coordination law 1550, 1551
 Coordination number 1403
 distribution, rock network 4955
 Coordination patterns 5719
 Coordination problem 6488
 Coordination task 7721
 Coordination variable 1538, 1539, 1551, 1553
 Coordinative level of description 5721
 Coordinative structures 1537
 Coore’s growing point language (GPL) 260
 Coornaert M 786
 Copeland and Galai’s model 5397
 Copeland score 9952
 Copeland’s procedure 9952, 9958, 9960
 Coprocessors, secure 5612
 Coproduct 1036
 Copula 6256, 7020
 copula density 6256
 empirical copula 6256
 Copy-cat strategy 5289
 Copying 5290
 Copying-fidelity 3208
 Core 1509, 1510, 1512, 1513, 1520, 1660, 1662,
 4095, 7756, 7761, 7769, 8253
 bipartite 8258
 main 8253
 p -core 8254
 (p,q) -core 8258
 stable 1520
 strict 1526
 symmetry groups 5969
 Core collapse
 encounter 8693
 three-body 8693
 Core GRN
 as a graph 1184

- cell phenotype 1184
 mammals 1182
- Core group 4659, 4662
- Core knowledge 1901
- Core memory 7835
- Core network 334
- Core number 8253
- Core-peripheral 2736
- Core set 7425, 7431, 7436, 7462–7467
- Core wars 334
- CORE*_{PCT} 7769
- CORE*_S 7772, 7773
- Coriolis parameter 9604
- Coriolis term, bundle reduction 5499
- Corner frequency 2474, 2485, 2488, 2583, 2584, 2591, 5022
- Corner period 2482
- Corona 624
- Coronal mass ejections 9278
- Corotation 412
- Corporate 2284
- Corporate finance 3386
- Correction, log-periodic 3865
- Corrections to scaling 7000
- Corrections to the energy 6728, 6731
 ϵ_1 6728, 6732
 ϵ_2 6728, 6732
 ϵ_3 6728, 6732
 ϵ_n 6728
 effective order 6731
- Corrections to the wave function 6728
 $\psi^{[2]}$ 6729
 first order 6728
 through order 6728
- Correlated equilibrium 439, 1587, 4096, 8658
 canonical 1588
 coalition proof 1594
 existence 1589
 objective 1590
 subjective 1590
- Correlated heterogeneity, invasion percolation 4956
- Correlated percolation 6544
- Correlated random effects 2775
- Correlated random slopes 2776
- Correlated reaction sets (co-sets) 5544
- Correlation 727, 1268, 1616, 3345, 3362, 3363, 3367, 4188, 4490, 5007, 7024, 8586
 anti 3368
 assortative 4490
 disassortative 4490
 function 1616
 long-range 4188
- Correlation and memory in discrete non-Markov stochastic processes 1617
- chain of connected kinetic finite-difference equations of a non-Markov type 1621
- finite-difference kinetic equation of a non-Markov type 1620
- set of dynamic parameters of non-stationarity 1621
- short memory function 1621
- Correlation coefficient, QSAR modeling 7076
- Correlation device 1588
- Correlation dimension 9843
- Correlation dimension D2 7997
- Correlation distance 7919
- Correlation energy 8576, 8578, 8582
- Correlation exponent 3759
- Correlation functions 1278, 2574, 3361, 3363–3365, 3371, 3757, 3759, 3883, 4213, 4381, 4387, 6088, 8715, 9684
 connected 3364
 Ripley's K-function 2574
- Correlation hole 8576
- Correlation integral 3509, 6260
- Correlation length 611, 1395, 1403, 3708, 3850, 3889, 5028, 5673, 6538, 6541, 6544, 6573, 8709, 8712, 8715
 biological fractals 3792
- Correlation length exponent 8713
- Correlation time 6995, 6998
- Correlations between degrees 3930
- Correlations of local fields 8592
- Correspondence 3873
 compact-valued 2221
- Correspondence analysis 8359
- Correspondence principle 7164
- Cortex 3341, 3358, 6100
- Cortical coordination 1553
- Cortical map 277, 284
- Cortical pattern generation 1553

- Cortico-striato-thalamo-cortical feedback-loops
 8004
- COS *see* Center-of-sets
- Coseismic seafloor deformation (CSD) **10055**
- Coseismic slip distribution **1694**
- Cosine transform (DCT) **10032**
- Cosmic background temperature **3273**
- Cosmic conspiracy **29**
- Cosmic evolution **3268, 3278, 3282**
- Cosmic expansion **3276**
- Cosmic microwave background **395, 1634**
- Cosmic strings **1639, 1642, 1643**
 - elastic **1651**
 - global **1645**
 - lensing **1652**
 - local **1645**
 - loop production **1648, 1651**
 - numerical simulations **1648**
 - semilocal **1655**
 - superconducting **1655**
 - wiggly **1652, 1655**
- Cosmological gravitational background **1635**
- Cosmological principle **395**
- Cosmology **3272**
- Cost **1663**
 - final **1502**
 - marginal **1666**
 - running **1502**
- Cost function **1660, 1815**
- Cost functional **1502**
- Cost game
 - cooperative **1663**
 - stand-alone **1663**
- Cost of an algorithm **7119**
- Cost of voting **9939, 9940**
- Cost share **1665, 1672**
- Cost sharing **1675, 4097**
 - additive **1675**
- Cost sharing problem **1660**
- Cost sharing rule **1660, 1665**
 - additive **1665**
 - additivity **1675**
 - anonymity **1666**
 - average **1674**
 - budget balance **1671**
 - constant returns **1675**
 - cost shares **1665**
- cross-monotonic **1672**
- decreasing serial **1675**
- game-theoretical rules **1668**
- independence of merging and splitting **1677**
- irrelevance of reallocation **1677**
- no advantageous reallocation **1677**
- positive **1675**
- separable cost remaining benefit solution **1664**
- serial **1674**
- Shapley-Shubik **1674**
- strong monotonicity **1666**
- Cotangent bundle **5445**
 - reduction **5488, 5491, 5495, 5498**
- Coulomb blockade **7309, 7350, 9645**
- Coulomb coupling **1021**
- Coulomb-exchange operator **7448**
- Coulomb failure **2615**
- Coulomb failure function **2439**
- Coulomb failure stress **2608**
- Coulomb gas method **8713**
- Coulomb hole **8578**
- Coulomb plasticity **10047–10049**
- Coulomb wedge **10048, 10049, 10052–10054,**
10056
 - dynamic **10051, 10053, 10054**
- Count data models **5554**
 - count regression **5564**
 - poisson regressions **5566**
- Count-up wave **259**
- Countable state Markov shifts **968**
- Countably additive **5454**
- Countably subadditive **5454**
- Counter-charge, polymer physics **6817**
- Counter-harmonic mean **229**
- Counter machine **7692, 7710**
 - reversible counter machine **7710**
 - simulating reversible counter machines **7690**
- Counterflow **3145, 6489**
- Counterpropagation neural network **2148**
- Counting **7097**
- Counting complexity **7184**
- Couple, definition **6301**
- Coupled dynamic piezoelectricity **5921**
- Coupled effects **5915**
- Coupled electromechanical phenomena **5919**
- Coupled Fano resonance **7300**
- Coupled identical oscillators **8912**

- Coupled map lattice 287, 2720
 Coupled systems 5916
 self-consistently 5916
 Coupler 8837
 Coupling 7606, 8201, 8203
 nearest neighbor 7614
 Coupling constant 8576, 8579, 8582
 Coupling of light and matter 5923
 Coupling pattern 8916
 Coupling strengths 7997
 Courtroom litigation 7060
 Coverage behavior, two-dimensional space with
 constraints 2060
 Covalent bond 6013, 6016
 Covariance
 scale 3865, 3869
 strong 3873
 Covariance function 3757, 3759, 3772
 Coven, Paul, Meester and Steif 2984
 Coverage behavior
 forming an ellipse with constraints 2061
 three-dimensional plume 2063
 two-dimensional plume 2062
 two-dimensional space 2058
 Coverage factor 4152
 Coverage method 3882
 Covering algorithm 1799
 Covering lemma 2939
 Covering number 5206, 5213
 Covering space 6322
 Cover's theorem 1822
 C^p-Norm 5085
 CR *see* Constraint release (CR)
 Crack 3700, 9877
 Crack model 5029, 9921
 Crack oscillation 9924
 Crack stiffness 9923
 Crack wall 9922
 Crack wave 9919
 Crackling noise 5022
 CRAFTY 4142
 Crapper's nonlinear capillary wave solution 9980
 Crashes 94
 market 3865
 Crater 9889
 Crawler 5266
 Cray XT3/4 5758
 Creation and termination of ties 5999
 Creation operator 8933
 Creative learning exchange 7061
 Creativity 8370
 Credibility 4798
 Credit 2822
 Creep 2019
 Cremer–McLean mechanism 5521
 Cricket localization system 265
 Crime participation 8229
 Crisis 7010
 economic 3865
 Crisp boundary
 fuzzy logic 3988
 Criteria 7754, 7760
 Criteria isolines
 neuro-fuzzy systems 6097
 Criteria isolines method
 neuro-fuzzy systems 6095
 Criterion 7753
 Mahler's compactness criterion 3032
 Criterion function
 block inconsistency 6917
 inconsistency 6917
 Critical behavior 1443, 6772, 6777
 Critical bottleneck strength for the mega-jam
 formation 9394
 Critical concentration 8714
 Critical curve 4555, 4556, 4559, 8709, 8715
 Critical density, percolation 3790
 Critical dimension 1130, 3368, 5029, 8713
 ergodic theory 3072
 scaling 3369
 upper 3368
 Critical domain wall 8728
 Critical dynamics, relaxational 3370
 Critical equation
 Aubry set 4554
 Hamilton–Jacobi equations 4549
 Critical exponents 477, 478, 648, 1395, 1404,
 1443, 1598, 2029, 2831, 3850, 6500, 6538, 6542,
 6543, 6571, 8712, 8713, 8715
 mean-field values 1404
 Critical fluctuation 1544, 5723, 5734, 7999, 8005,
 8199, 8201, 8209, 8928
 Critical force 2033
 Critical fractional volume 1444

- Critical instability 8000, 8003
 Critical interface 8716
 Critical local speed 9361
 Critical networks 1200
 Critical opalescence, biological fractals 3792
 Critical parameter 4542
 Critical part of the spectrum 936
 Critical path method 1847, 1850
 Critical periods 1902
 Critical phenomena 2024, 3847, 4913, 7013, 8711
 critical exponents 4913
 critical slowing down 4913
 power laws 4913
 scale invariance 4913
 self-organized criticality 4913
 universality classes 4913
 Critical point 1402, 5011, 5021, 6784, 7855, 8712, 9232
 biological fractals 3791
 Critical point universality 6663
 Critical properties 644
 Critical rate 5720, 5726
 Critical slip distance
 earthquake 2552
 earthquake nucleation process 2539
 Critical slowing down 1544, 1548, 5723, 7004, 8928
 Critical speed 9982
 Critical states 1898, 1899
 Critical subsolution, Hamilton–Jacobi equations 4550, 4551, 4556, 4557
 Critical surface 6586
 Critical temperature 6773, 8712
 Critical value 5722, 9232
 Criticality 476, 7870
 critical 476
 scale-free characteristics 7865
 CROCUS 1705
 Cross 4103
 Cross-correlation 9856
 Cross-impact analysis 7835
 Cross-impact matrices 7834
 Cross-inhibition 3286, 3287, 3290, 3291, 3298
 Cross-link density, polymer physics 6818
 Cross-linkers 1756, 1761, 1763
 Cross-linking 6819
 Cross-national observations 2795
 Cross-phase modulation 1376
 Cross section 6741, 6743, 9254
 Cross-validated correlation coefficient, QSAR modeling 7076
 Cross-validation (CV) 1698, 1816, 3513
 Crossbar array 5865, 5867, 5880, 5881
 storage capacity 5881
 Crossbars
 diode 5880
 FET 5881
 resistor 5880
 Crossing number 9270
 Crossover 121, 3758, 3764, 4135, 4873
 operation 4150
 Crosstalk 724
 Crothers, Charles 8269
 Crowd 5596, 6476
 Crowd-anticrowd 5589
 approaches 5593
 Crowd disaster 3146, 3154, 6484
 Crowd dynamic 1180
 Crowd modeling 186
 Crowd motion 878
 Crowd turbulence 6489
 Crushing 6489
 Crustal deformation 1690
 block modeling 4268, 4270
 dislocation sources 4258
 inferring source characteristics 4261
 modelling with GPS data 4258
 Mogi deformation source 4258
 sensitivity of GPS data to 4260, 4270
 source geometry 4258–4261
 Crustal deformation monitoring 1219
 “Cry wolf” issue 2417
 Cryosphere 1705
 Cryosphere models 1704
 Cryptography 5477, 7089, 7090, 7097
 computationally secure 7089
 public key 7095
 public-key 7089, 7090
 quantum 7112
 quantum computationally secure 7113
 quantum information processing 7367
 Crystal growth 9771
 Crystal symmetry 5751

- Crystallization 3727, 5475, 9763, 9766, 9767
 latent heat 9775
- CS *see* Complexity science
- CSCA – clonal selection classification system 2130
- CSS code 7334
- CTP *see* Theory of perceptions
- Cubic 712
- Cubic Boltzmann equation, Uehling–Uhlenbeck equation 7818
- Cubic nonlinear Schrödinger equation 9996
- Cultural diffusion 3214
- Cultural evolution 3270, 3281
- Culture 3205, 8243
 corporate 7841
- Culture evolution 1879
- Cumulated profits 1972
- Cumulative probability 2801
- CURE 5055, 5060
- Current distribution 3850
- Current-flow betweenness 1150
- Current-mode logic 9720
- Currents, synaptic 6103
- Curse of dimensionality 214, 4403, 5350, 7123
- Curta 5476
- Curvature 3040, 8956
 as a two-form on the base 5505
 of a connection 5504
- Curvature effect 691, 694
- Curve fitting 5207, 5209, 5210
- Curved plates 698
- Curvelet transform
 coronization 1727
 first generation 1724
 second generation 1727
- Curvelets 1719, 8675
 wedge 1727
- Curves 714, 3833, 8713, 8722
 fractal 3863
 Menger sponge 3836
 shortening 6606
 space filling curve 3833
 von Koch curve 3833, 3835
- Cusp 2024
- Cuspons 80
- Customer base 7846
- Cut-and-choose 3328
- Cut-off function 937
- Cut-out 8249
- Cutoff
 lower 6999, 7000
 upper 6999
- Cutoff function 5028
- Cuts 8251
 line-cut 8252
 vertex-cut 8252
- Cutting and stacking 2974
- Cutting bonds 2840
- Cutting plane algorithm 6420
- CW *see* Computing with words
- Cybernetics 1043, 1111, 1118, 8974–8977
 first-order 1109
 second-order cybernetics 1110
- Cycle monotonicity 5517
- Cycle period 70–72, 76
- Cycles 2712, 4487, 6241, 8271
 bistable 1385
 multistable 1385
- Cyclic actions, symmetry groups 5963
- Cyclic CA 776
- Cyclic group C_{6k} 5968
- Cyclic group of order $2n$ 5966
- Cyclic mapping, parallel computing 154
- Cyclic set 9231
- Cyclic states 64
- Cyclic subspaces 5464
- Cyclic tag system 7687, 7709
- Cyclical pattern 7848
- Cyclicity 9771
- Cyclomatic number 2201
 fracture network 6516
- Cyclone Ingrid 3128
- Cyclone Larry 3116, 3130
- Cyclone Tracy 3134
- Cyclooxygenase-2 (COX2) 2121, 2145, 2170
- Cylinder set, ergodic theory 6943
- Cylindrical shells 691
- Cylindrical source 9906
- Cylindrical Wiener process 6229
- Cyprus 7842, 7843
- Cyprus' Tourism Organization 7843
- CYSTAT 7843
- Cytochrome P450 2167

- Cytoskeletal proteins 1745, 1751, 1752, 1756
prokaryotic 1752
- Cytoskeleton 1738, 1739, 1741, 1743–1745, 1747, 1748, 1751, 1753, 1754, 1761, 1762, 1764–1770, 1772–1774
active filament bundles 1771, 1772
active filament solutions 1767, 1771
active filaments 1767
active polar filaments 1766, 1771
active polymer solutions 1765, 1767
active-polymer solutions 1767
eukaryotic 1745, 1768
polar films 1774
prokaryotic 1741, 1745, 1751
- D**
- d*-Dimensional full A-shift 8905
d-Dimensional rules 74
d-Dimensional shift of finite type X 8905
d-Dimensional shift space 8905
Da Vinci, Leonardo 5475
Dacite 9798
Dadic and Pisk 8844
Daganzo's cell transmission traffic flow model 9330
DAH 532, 533
Daily stock price, fuzzy syszem models 4091
Daisyworld model 3296, 3297
d'Alembert solution 9986
Damage 2371, 4190
 diversity 4190
 reduction 4190
DAML (DARPA agent markup language) 8092
DAML+OIL 8092
Damping 6962, 6969
 acoustic 6960
 control gains 59
 distributed 1493
 indirect 1498
 memory 1500
 viscous 6960
Danger theory 4782
Dangling ends 611, 2836, 2840, 3705, 3709, 3853
Dangling page 5277
Dansgaard–Oeschger cycle 11
DAO-E Sierpinski 5641
Darboux basis 2262
Darboux chart 2262
Darboux co-ordinates 2262
Darcy's law 1399
Dark energy 1644, 3273
Dark figure 8229
Dark matter 1644, 3273
DARPA 1477
DART 9594, 9635
Darwin 1883
Darwin, Charles 3662
Darwinian evolution 3291, 3294, 3297
Darwinian principle 8943
Darwinism 3270, 7583
Data
 imprecise 4049
 incomplete data 7798
Data analysis 6000
Data assimilation 9642
Data attribute descriptions 4399
Data bus, quantum computing 7231
Data classification 2163
Data cleanings 1989
Data collapse 6999
Data collection techniques 9434
Data errors, noise 1989
Data fusion 4404
Data (information) model 4305
Data-logger 2396
Data mining 128, 1827, 4314, 4325, 4328, 4332, 4392, 4404
 approach to traffic prediction 9502
 dependency 1864
 granularity 1864
 independence 1865
 process 4398
 technique 4147
Data mining frameworks
 orange 2000
 Weka 2000
Data preprocessing process 4398
Data reduction 1775
Data-space 512, 513
 biological 512, 513
Data storage 2093

- Data table 8259
 keys 8260
 records 8259
- Data transmission system 2395
- Database 2404, 4314, 7729
 events 2406
 instrumental 2404
 publicly available 7084
 waveforms 2406
- Dataset 1828
 complexity 7072
- Datastructure 6399
 continuous space machine 6391
- Daubechies 4 10014, 10016, 10019, 10029
 wavelet 10013
- David-star 3704
- Davis, Martin 288
- Daylight saving time changes 3469, 3472
- DBCLASD 5058
- DBSCAN 5057
- DCG *see* Dynamic commons game
- DD *see* Duplication and diversification
- DDOS *see* Distributed denial of service
- De Bruijn diagrams 73
- de Casteljau's algorithm 5803
- De Hoffmann-Teller frame 36
- De Vries, Gustav 81, 84, 8114
- Deadlocking, parallel computing 155
- Deadly earthquakes 2500
- Dealer markets
 multiple 5394
 single 5394
- Dealer model 3817
- Dealers, market microstructure 5397
- Dealing 2000-2 5395
- Death spiral 9026, 9028
- Deblurring 10031
- Debt 2804, 2806, 2822
- Debye equation 2694
- Debye–Hückel approximation 5578
- Debye screening length, polymer physics 6816
- Decane (oil)-SWCNT 696
- Decay
 exponential 1496
 of correlation 965, 2930
- Decaying harmonic oscillations 9914
- Decentralization 1559
- Decentralized control 5618
- Decidability 801, 816
- Decimal 5451
- Decision 4412, 7792, 8005
 strategic 7850
- Decision forest (DF) 1840, 2168
- Decision making 4056, 4075, 4562, 8005
 utility function 7536
- Decision mechanisms 9413
- Decision problem 9160
- Decision rules 1795, 4412, 7753, 7756, 7761, 7767, 7769, 7771, 7774, 7778, 7792
 approximate 7761
 Bayesian confirmation measures 7762
 certain 7757, 7761
 confidence 7757, 7762
 minimal 7757, 7762, 7767
 possible 7757, 7761
 relative support 7762
 robust 7762, 7779
 strength 7757, 7768
 weak 7768
 with a minimal number of descriptors 1795
- Decision system 1793, 7791
- Decision table 1865, 7756
- Decision theory 461, 9433
- Decision time 8390
- Decision tree 1826, 1993, 2165, 4739, 4745
- Decision under uncertainty 7753, 7773
- Decision window 9862, 9864
- Declarative graduation, fuzzy logic 3991
- Decoding 1783
- Decoherence 1008
 quantum computing 7237
 vibrational state 7239
- Decoherence-free subspace 7340, 7389
 quantum computing 7238
- Decoherence-free subsystems 7340
- Decomplexification, network 505
- Decomposition 8247, 8670
 of the motion 6599
- Deconvolution 1719
- Decoupled approaches 5788
- Decoupler 8837
- Decoupling of self-diffusion (D_s) and viscosity (η) 4219
- Decreasing preimages 9256

- Decreasing returns to scale 1679
 Dedekind eta function 6529
 Deduction 214
 fuzzy logic 3986, 3987, 4002
 Deductive data mining 4354
 Deep brain stimulation 8005
 Deep earthquake 2493
 Defect 699, 4228, 6195, 6462, 6463
 penta-hepta 6464
 spatial phase 771
 temporal phase 770
 Defect chaos 6473
 Defect dynamics 394
 Defect-mediated turbulence 6201
 Defect of information 4825
 Defect-tolerant 5871
 Defective tile 6777
 Defence analysis 9042
 Defense, neoclassical economics 178
 Deference 8240
 Deferred-acceptance algorithm 4097
 Deffuant model 6385, 8398
 Deficit angle 1642, 1643, 1652
 Defining systems 6331
 branch point continuation 6344
 codimension 1 bifurcations of limit cycles 6340
 formulation as a BVP 6347
 Deformation 8855
 basic 2639
 Deformation nucleus 2641
 Deformation of the crack wall 9925
 Deformation rigidity 3102
 Defuzzification 4073, 6935
 center-of-area 4073
 center-of-gravity 4073
 Defuzzified 4882, 4884
 Degassing 9767
 Degeneracy 1428, 5764, 6731
 accidental 6736
 degree of 6736
 normal 6608
 residual 6731
 Degenerate 8325
 Degenerate eigenvalue 6730
 Degenerate perturbation theory 6679
 Degenerated 703, 715
 Deglaciation 11
 Degree 237, 764, 4487, 6241
 computation 237
 intermediate 764
 node 237
 Turing 764
 Degree centrality 8287
 Degree correlations 3935, 6054
 average degree of neighbors 6054
 Degree-degree correlation 4489
 Degree distribution 725, 2875, 3668, 3925, 4487,
 4491, 5659, 5694, 6004, 6048, 6051, 8263, 8324,
 8327, 10059
 biochemical information 502
 cutoff 4491
 degree exponent 6049
 hubs 2730
 Pareto 10060
 Poissonian 6050
 power law 10060
 power-law 6050
 Zipf 10060
 Degree matrix 5354
 Degree of compatibility 8681
 Degree of dependence
 decrease 1872
 divisor 1869
 subdeterminant 1870
 Degree of fracturation 6507
 Degree of freedom 1540, 2262, 4515, 5024, 5066,
 5719, 6426
 Degree of granularity, dependence 1871
 Degree (or connectivity) 575
 Delauney triangulation 7898
 Delay 1850, 1851, 9043, 9457
 Delayed discharge model, sectors 4568
 Delayed feedback 627, 629
 linear multi-site 635
 linear multisite 634
 linear single-site 635
 nonlinear 636, 638
 Delayed hospital discharge model 4569
 examples 4568
 impact 4570
 outcomes 4568
 Delayed hospital discharges 4567
 Delayed synchronization algorithm 3550
 Deleterious mutations 5657

- Deliberative agents 188
 Delivery
 dental care 4577
 HMO planning 4577
 mental health 4577
 Delphi 7834
 Delta rule 1817
 Demand-controlled
 stimulation 634
 stimulus administration 632
 stimulus length 633
 Demand elasticity 1977
 Demand for health care managing 4572
 Demand game 1660, 1662, 1670, 1678
 Demand monotonicity 1679
 Demand revelation game 1660, 1662
 Demand revelation mechanisms 1671
 Demixing 855
 polymer physics 6813
 DEMTER 2632
 Denali fault earthquake 2602
 DENCLUE 5058
 Dendrite 1814, 3334
 Dendritic crystal growth 3725
 Dendrogram 1141, 1146
 Dengue fever, effects of climate change 1101
 Denial of service, mobile agents 5611
 Denoising 1719, 8671, 10031
 hard-thresholding 1721
 minimax rate 1730
 Dense groups 8253
 Density 2947, 3147, 4497, 4500, 8236, 8268, 8270, 8275
 dimensionless 6516
 isotropic fracture networks 6516
 probability 3874
 Density classification 3233
 Density classification (or majority classification) task 3235
 Density classification task 3238
 Density contours 1265
 Density dependent control 9020
 Density fluctuations 7570, 7573
 Density function 1674
 Density functional theory (DFT) 692, 1309, 8577
 Density matrix 7412, 8109
 consistency 7187
 equation 8933
 purification 7391
 quantum mechanics 7373
 Density of cars 9729
 Density of states 1318, 1320, *see* Semicircle Law,
 see also Semicircle Law
 Density wave 3145
 Deoxyribozyme 5652
 Deoxyribozyme-based full adder 5647
 Deoxyribozyme-based half adder 5646
 Deoxyribozyme-based logic gate 5641, 5643, 5644, 5647
 Deoxyribozyme logic gate 5649, 5654
 Dependence
 degree 1868
 rank 1868
 Dependence graph 8322
 Dependence measures 6254
 bivariate function 6265
 bispectrum 6264
 Hellinger distance 6260, 6268
 Kendall's tau 6255
 mutual information 6266
 Spearman's rank correlation 6255
 spectral density 6264
 Dependencies among attributes 1791
 Dependency
 attribute 1865
 constant 4966
 graph 163, 166
 Dependent Schrödinger solver 1023
 Dephasing 4195, 4198, 4201, 4202, 4208, 6122
 Depinning
 anisotropic medium 1136
 charge density wave 1135
 driven transition 1130
 interface 1135
 Depinning transition 5027
 Deployment algorithms 7723
 Depression 3457
 Depression (mood) 3470, 3472, 3473
 Depth compensation 50
 Depth electrodes 629
 Depth estimation 4772
 Depth-independent interaction matrix 56
 Depth phases 2486
 Depth ratio 47

- Derivable function 6298
 Derivates, futures 5410
 Derivation, Navier–Stokes equations 5928
 Derivative of Gaussian 3346
 Derivatives 5407, 5411
 covariant 3877
 options 5415
 Derrida plot 1200
 Desai–Zwanzig model 5241
 Descartes 418
 Descent 8347
 Description logic 4412, 8344
 Descriptions of knowledge states 4398, 4400, 4401
 Descriptive adequacy 1882, 1907
 Descriptive data mining 4398
 Descriptive expressions 4398
 Descriptive language 4398, 4399
 Descriptive model 4394, 4398
 Descriptor values, QSAR 7072
 Descriptors 7792
 chirality-sensitive 7075
 molecular 1303
 QSAR modeling 7073
 Design-based and model-based inference 8226
 Design concepts and details (ODD) protocol,
 overview 157
 Design principle 719, 720
 Designability 735
 Desired velocity 6488
 Desires 7542
 Desulphurization, fuzzy system models 4091
 Desynchronization 629, 635, 638
 Detailed balance 5670, 6995
 Detectable deviation 7623
 Detection of bifurcations 6338
 codimension 2 bifurcations 6342
 homoclinic bifurcations 6348
 test functions for codimension 1 bifurcations
 6338
 test functions for codimension 1 cycle
 bifurcations 6339
 Determinantal divisor 1865
 Determining equations 6178
 Deterministic 5024
 Deterministic automaton 4739
 Deterministic cellular automata 872
 Deterministic chaos 2719, 2903, 6195, 6196, 8423,
 8426
 Deterministic fractal 3880, 6787, 7568
 Deterministic modeling 556
 Deterministic perturbations 970
 Deterrence 4855
 Detrending 3762, 3763, 3765
 Deutsch 7254
 Deutsch–Jozsa algorithm 7380
 quantum computing 7239
 Developing countries 2419
 Development 1873, 2854
 historical 1876
 human 3865
 individuals 1876
 multi-cellular organism 1192
 Developmental dynamic system 1873
 Developmental-genetic toolkit 545
 Developmental plasticity 1916–1921, 1923–1925,
 1928
 behavioral development 1921
 morphological change 1921
 Developmental psychology 1874
 Developmental robotics 2856, 4648
 Developmental state space 1882
 Developmental states 1873
 Developmental system 1882, 1888, 1890, 1918,
 1919
 Developmental theories, Fischer's theory of iterative
 embeddings of components 1877
 Developmental timing 1905
 Developmental trajectories 1907
 Developmental/learning 2845
 Deviations principle, ergodic theory 6941
 Device scaling 5747
 Device simulation 5749
 Devices
 carbon nanotube (CNT) 5865
 molecular 5866
 resonant tunneling 5865
 single electron tunneling (SET) 5865
 spin logic 5866
 Devil's staircase 2258
 Devisor 1865
 Dewey 7851
 DFT/MD 5894
 DGP 9373

- Dhar 8035
 Diabetes 5547
 Diagnosis of mental health, modeling 4573
 Diagnosis, modeling 4571
 Diagnostic automaton 5641, 5643, 5644
 Diagonal mapping 3560
 Diagonal mapping scheme 3561
 Diagonalization 5758
 Diagram
 Bonzani and Mussone 9731
 fundamental 9730
 Greenberg 9731
 Greenshield 9731
 LWR 9730
 velocity 9730
 Diagram of different congested patterns 9372
 Diagrammatic method 8581
 Diagrammatic rule 1936
 node factor 1937
 propagator 1937
 Dialectics, multiperspective 7850
 Dialog 9048
 Diameter 4488, 6241, 10061
 Diamoeba 4503
 Diamond 690, 691, 700, 9252
 Diblock
 co-polymer 6829
 morphology map 6829
 Dichotomies 1559
 Dichotomous worldview 8193
 Dictator 9945
 Dictionary 2317
 Dictyostelium discoideum 3349
 Dielectric breakdown model 3720
 Dielectric constant 5577
 Dielectric permittivity 1399
 Dielectric susceptibility 4214
 Dielectrophoresis 5580
 Diffeomorphism 703, 709, 6659, 6951
 construction of 6593
 local 6593
 Difference engine 5476
 Difference equation modeling 8993
 Difference equations (DEs) 3696
 Difference, definition 6297
 Differentiability 3860, 6297
 definitionb 6297
 Differentiable dynamics 3054, 6950
 Differentiable rigidity 3095
 Differential 6286
 Differential adhesion 525, 532, 545
 Differential analyzer 273, 285, 3357, 5475
 Differential equalizer 5477
 Differential equation system 5960
 Differential equations 3831, 8639
 chemical 329
 existence and uniqueness theorem 8631
 symmetry of 6176
 Differential game 4096, 6284, 6478
 Differential ground motion 2429
 Differential inclusions 6277, 9105
 Differential information content 4823
 Differential motion 2426
 Differentiation 525–529, 531, 532, 1881, 2247
 multi-cellular organism 1192
 Differentiation of society 8184
 Diffraction 8484
 Diffusion 86, 284, 310, 530, 536, 537, 695, 854,
 1278, 3285, 3288, 3289, 3293, 3337, 3348, 3357,
 3936, 5672, 6785, 7528, 7829, 8272, 8714, 8940,
 9792, 9796
 anomalous 310
 chemical gradient 259
 gradients 536
 in amorphous computing 259
 normal 310
 paradoxical 315
 time series 3585
 Diffusion coefficient 8722
 Diffusion constant 884, 7571
 Diffusion equation 312, 2801, 3883, 5219
 normal 312
 on fractal lattices 320
 Diffusion exponent 7569
 Diffusion function 3656
 Diffusion-limited 3368
 Diffusion-limited aggregation (DLA) 3720, 3785,
 3786, 3884, 7579
 advection-diffusion 3731
 branch competition 3733
 crossover 3730
 fixed scale transformations 3734
 noise reduction 3733
 numerical methods 3725

- theory of DLA 3732
 Turkevich–Sher relation 3732
 Diffusion-limited CCA (DLCA) 3884
 Diffusion-limited cluster-cluster aggregation (DLCA) 3884
 Diffusion-limited reaction 7570, 7579
 Diffusion matrix, stochastic processes 3584
 Diffusion of innovation 1956, 5377–5379, 5384, 8307, 8990
 Diffusion process 883, 8272
 Diffusion solution 7917
 Diffusion tensor 8591
 Diffusion wavelets 10042
 Diffusive coefficient 10037
 Diffusive equation 8547
 Diffusive shock acceleration 22, 25
 Diffusivity 1399
 Digital computation 271, 276
 Digital computer 274
 development 7366
 Digital images 10031
 Digraph 6239, 6241, 7714, 8281, 8353
 minimally connected 6244
 simple 6241
 strongly connected 6241
 weighted 6241
 Dihedral action, symmetry groups 5963
 Dihedral group $G=D_{2n}$ 5965
 4-Dihedral periodic minimizers 5971
 6-Dihedral symmetric periodic minimizers 5971
 Dihedral (torsion) angles 2689, 2829
 rotation 6013, 6016
 Dihydrofolate reductase (DHFR) 2130
 Dijkstra's algorithm 6409, 6411
 Dike 9886
 Dilatation equation 6862
 Dilatation invariance 8722
 Dilatation matrix 589
 Dilatation symmetry 2253
 Dilations 3859, 3861
 Dimension 315, 3827, 3833, 3842, 6787
 box 3827, 3842
 chemical 3701
 correlation 3509, 3828, 3842
 critical 3870
 fractal 314, 3701, 3827, 3863, 3865
 Hausdorff 3029, 3036, 3827, 3836
 information 3842
 Lyapunov 3827, 3842
 Lyapunov (Kaplan–Yorke) 3508
 maximum determinable 375
 metric 3835
 not diagnostic of chaos 375
 quantum system 7370
 spectral 317
 topological 3827, 3834, 3835, 3843, 3863
 variable 3869
 Walk's 315
 Dimension group 8899
 Dimension-like characteristics, topological entropy 3018
 Dimension spectrum 3025
 Dimension theory
 higher-dimensional dynamical systems 3022
 low-dimensional dynamical systems 3022
 Dimensional complexity 8004
 Dimensionality 3932
 Dimensionality of a data set
 curse of dimensionality 1989
 Dimensionality problem 1802
 Dimensionality reduction 1775, 1784, 1990, 5349, 7793
 Dimensionless density 6516
 percolation properties 6514
 Diode 9705
 Diophantine approximation 3055
 Diophantine condition 1939, 2262, 4515, 6322, 6324
 Bryuno condition 1939
 Melnikov condition 1944
 standard 1939
 Diophantine frequency vector 2262, 4515
 Diophantine property 6669, 6670
 Diophantine vector 5066, 5990, 6681
 Diploid-based synthetic lethality analysis with microarrays (dSLAM) 9109
 Dipole–dipole interactions 8588
 Dipole moment 6121
 Dipolynomial representation 68
 Dirac bracket, qubit 7370
 Dirac system 2045
 Dirac tensors, invariant forms 2644
 Dirac's delta function 3334, 3343, 3346, 7453
 Direct cascade 8727

- Direct dominance 6027, 6035
 Direct integration 8119
 Direct interaction approximation 3650
 Direct interaction models 191
 Direct product 8298, 8299
 Direct scattering problem 4960, 4962, 4965
 Directed graphs 5268, 6001, 6030, 6048
 networks 1182
 Directed networks 6056, 6788
 acyclic 6056
 bow-tie 6056
 Directed percolation 3369, 3752, 4917, 6774, 7576
 Directed search 2458
 Direction fields 3350
 Directional bivariate wavelets 598
 Directional entropy 9258
 Directional sensitivity 1719
 Directional solidification 6466
 Directivity 2612
 effects 4453
 Dirichlet boundary conditions 4806, 6713
 Dirichlet condition 6223, 6224
 Dirichlet's principle 1406
 Disassortativity 578
 Disaster 3110, 3143
 impact severity 3114
 lead time 3114
 management 3112
 mitigation 3113
 Discharge rate 9765
 Disclination density 2645
 Disclinations 2025, 6462, 6469
 Disconnect 5426
 Discontinuous system
 escaping vector field 6699
 regularization 6700
 sliding vector field 6699
 Discontinuities 1053, 1898
 discrete 6505
 in rock 6505
 Discontinuous feedback 8625
 Discontinuous Galerkin method 7892, 7897
 Discontinuous system 6698
 Discount factor 7618
 Discovery system 1984
 Discrete baker transformation 75, 76
 Discrete choice 5553
 conditional logit (CL) model 5556
 Luce model 5556
 probit 5556
 random utility model 5555
 Discrete Euler–Lagrange 2004
 Discrete Euler–Poincaré 2005
 Discrete event simulation 162, 330
 Discrete event system specification (DEVS)
 formalism 349
 Discrete Fourier transform 9914
 Discrete Hamilton's principle 2004
 Discrete interval valued type 2 fuzzy sets (DIVT2FS)
 4090
 Discrete Lagrange–d'Alembert principle 2012
 Discrete Lagrangian and Hamiltonian mechanics
 2004
 Discrete Langevin processes 3577
 Discrete Laplacian 3739
 Discrete mechanical systems 5498
 Discrete membership values 4090
 Discrete multiwavelet transform 5846
 algorithm 5848
 Discrete quantum object set 7435
 Discrete scale invariance (DSI) 7568
 Discrete stochastic approach 555
 Discrete systems 5306
 Discrete time 280, 3524
 evolution 3577
 series 1616
 SV models 8784
 Discrete variational principle 2003
 Discrete wave-number method 2415
 Discrete wavelet transform 8671
 Discreteness 2318, 2319, 5024
 Discretization 1834, 3303, 4186, 6801, 7797, 7799
 based on cluster analysis 7799
 equal frequency per interval 7799
 equal interval width 7799
 minimal class entropy 7799
 of attributes 1798
 Disease spread 8308
 Diseased lungs, biological fractals 3784
 Diseases 1075
 Disequilibrium adjustment 7849
 Disjoining pressure 3617

- Disjointness 5040
 ergodic theory 3076
- Disjunction 4878
- Dislocation 2025, 6462, 6464
- Dislocation density
 dislocation-relation 2645
 dislocation-stress 2645
- Dislocation patch 5027
- Dislocation theory 7855
- Disorder 2019, 5023, 5776, 6407
 atomistic 5777
 correlated 6409
 strong 3850
 weak 3850
- Disordered solids 8588
- Disordered system 2260, 6407
- Dispersal limited community 2706
- Dispersion 84, 1376, 2041, 2474, 6217, 8483
 anomalous 1376
 linear 84
 management 2341
 nonlinear 84, 88
 normal 1376
 relation 9969, 9975–9977, 9990, 9993, 9997, 9998
- Dispersive equation 2041
- Dispersive estimate 2041
- Displaced maxwellian 7415
- Displacement
 field 6121, 6122
 fluid-fluid 4948
 spectrum 2482, 2485
- Disruption 1848, 1850–1852
 and delay in complex projects 8989
- Dissipation 1494
 McGehee coordinates 5980
 relation 1495, 1496
- Dissipative 4589
- Dissipative cities 7960
- Dissipative models 288
- Dissipative non-linear form 5230
- Dissipative range 3653
- Dissipative scale 3642
- Dissipative structures 478
- Dissipative surface diffeomorphisms 3019
- Dissipative system 288
- Dissolution of a flow interruption interval 9398
- Distal 9237
- Distance 575, 6241, 8236, 8271
 algorithmic 255
 Cantor 249
 epicentral distance 2479
 of particles in amorphous computing 265
 teleseismic distance 2479
- Distance-based information descriptors 4831
- Distance between two fuzzy sets 4066
- Distance cutoff value 7078
- Distance matrix 6837
 diagonal elements of 6838
 reciprocal 6838
- Distinguished eigenvalue 6248
- Distributed algorithm 7713, 7715, 9105
- Distributed architecture for mobile navigation 8439, 8442
- Distributed artificial intelligence 361
- Distributed controls 1225
- Distributed denial of service (DDOS) 5615
- Distributed programming 5605
- Distributed quantum information, trapped ion 7244
- Distributed robotics 1225, 2073
- Distributed sensor grids 5614
- Distributed simulation 352
- Distributed systems, mobile agent applications 5615
- Distribution 1049, 1051, 3404, 5022, 8713, 8716
 conditional 3425
 fat-tailed 3404
 financial market returns 3404
 marginal 1866
 stationary 6995
 tail behavior 3407
- Distribution function 236, 9735
 hub 236
 power law 236
- Distribution of distances, biological fractals 3781
- Distribution of forces 5016
- Distributive justice 1661
- Disturbance 711, 9361
- Ditto 5473
- DIVA model 2320
- Divergence 3870, 9696
- Divergence measures 6254, 6256
- Cramér–von Mises criterion 6257

- integrated functions of density differences 6258
 Kolmogorov–Smirnov statistic 6258
 Kullback–Leibler divergence 6258
 quadratic forms 6262
 Diversification, multi-cellular organism 1192
 Divide-and-conquer genetic-fuzzy problem for items with a single minimum support (DGFSMS) 4155
 Divide-and-conquer genetic-fuzzy problem for items with multiple minimum supports (DGFMMMS) 4157
 Divide-and-conquer strategy 3544, 4403
 Dividend 95
 yield 3462, 3464, 3465, 3468, 3469
 Dividing-and-multiplying pattern 9719
 DiVincenzo criteria 1018
 DiVincenzo's checklist 7209
 Division of labor 3691–3695
 Divisive algorithm 1150
 Divisive clustering 5054
 Divisor, elementary 1870
 DIVT2FS *see* Discrete interval valued type 2 fuzzy sets
 d_k 3929
 DLA 884, *see* Diffusion limited aggregation, 3853
 DMWT *see* Transform
 DNA 418, 2091
 addition 2097
 and chromatin 3923
 as genetic logic unit 258
 computation 932
 computing 5479
 ecological information 2699
 entropy 494, 495
 fractal features 3795
 information content 4829
 nanostructure 5479
 origami 2102, 2108
 replication 3908
 self-assembly 2106
 sequence 494, 495, 3795, 3893, 3895
 sequence entropy 495
 strand-asymmetry 3903
 tiles 5867
 tiling assembly 5479
 walk 3896, 3904
 Docking 2122
 Dodgson 9944
 Dodgson score 9953, 9959
 Dodgson winner 9959
 Dodgson's procedure 9953, 9958, 9959
 homogeneous 9959
 Domain 770, 6784
 chaotic 771
 filter 771
 growth 4231
 interface 775
 multiple 772
 of attraction 9227
 problem, sequential compactness 2220
 regular 770
 size 9693
 wall 6462, 6468, 8713, 8716
 Domany–Kinzel 6774
 Dome 9763, 9876
 Dome growth 9773
 Dominance 1669, 7753, 7760, 7769, 7770, 7773
 based rough set approach (DRSA) 7760, 7784
 classical 7773
 cone 7760, 7762
 overwhelmed 1670
 solvable games 3189, 3192
 stochastic 7773
 successive elimination of (strictly) dominated strategies 1669
 weak domination 1669
 Dominance relation 1662, 6024, 7767, 7768
 graded 7767
 irreflexive 6024
 multi-graded 7768
 transitive 6036
 Dominant logic 7850
 Dominated splitting 4733
 Dominates, stochastically 7774
 Domination 1518
 direct 1528
 indirect 1528
 strong 1526
 weak 1526
 Domination path 6036
 Domino tiling 5478
 Doob's theorem 6232
 Dopamine antagonists 2169

- Doping, modulation 5776
 Doppler cooling
 quantum computing 7226
 Doreian, Patrick 8269, 8274
 Double banana configuration 2838
 Double-entry accounting 2806
 Double layer 25, 9689
 Double resonance 8490
 Double series representation 6208
 Double well model
 splitting 6754
 symmetric double well 6757
 Double Z-characteristic 9391
 for phase transitions in vehicular traffic 9327
 Double Z-speed-density characteristic 9286
 Doubling map 2920
 Down-sampling 10035
 Downarowicz-Serafin entropy realization theorem 967
 Downsian model of political competition 9938
 Downward causation 120
 Drainage networks 3823
 Dreicer field 35
 Drift 3531, 3534
 time series 3585
 Drift function 3656
 Drift terms, Gaussian noise 3583
 Drift vector, stochastic processes 3584
 Dripping handrail 378
 Driven diffusive lattice gas 3372
 Driven diffusive systems 3372
 Driven nonequilibrium system 8727
 Driver reaction time 9334
 DRSA 7784
 Drug bioavailability 2186
 Drug design 1303
 Drug discovery 1302, 2161
 and development 2141
 Drug-like compounds 2166
 Drug synthesis 2102
 Drug target 2161, 5546, 5548
 DSGE model 5344, 5345
 DTA, traffic stream behavior 9445
 Dual game 7647
 Dual lattice 1408
 Dual problem 1489
 Dual rail 7252
 Dual recursive formula 7647
 Dual sequence 6247
 Duality 8724, 8726
 controllability/observability 4811
 DUEM model 1057, 1064, 1065
 Duffie, Pan and singleton stochastic volatility jump-diffusion model 8792
 Duffing's equation 6621
 Dummy 1685
 Dummy player 1663, 1665
 Duopoly market game
 Bertrand 1530
 Cournot 1530
 Duplication and diversification (DD), genomes 5699
 Duplication and rewiring
 model of 5700
 Duplication model 7503
 Duplication step 7503
 Duration dependence 2751
 Duration magnitude 2477
 Dürer Pentagon 3704
 Dusty gas 9806
 Dutta's solution 9953
 Dyad 6001, 8200, 8202, 8205
 Dyadic 6007
 Dyadic independence model 8323
 Dyke 9766, 9778
 Dynagraph 8842, 8843
 Dynamic algorithm 1154
 Dynamic circular crack 2592
 Dynamic commons game (DCG) 2226
 Dynamic complexity 1960, 4577, 7999, 8001, 8003
 Dynamic core hypothesis 1427
 dynamic core 1424
 Dynamic coupling patterns 8919
 Dynamic decomposition weight 8963
 Dynamic diseases 7992
 Dynamic environment 1975
 Dynamic factor model 450, 2751, 2752, 2755
 Dynamic fields 1893
 Dynamic fractals 3793
 Dynamic friction 5025
 Dynamic game 4095, 4099
 aggregative growth model 2225
 argument 2218
 asymmetry 2226

- Bellman optimality equation 2220
 business-as-usual equilibrium 2228
 characterization 2220
 climate change 2215
 climate change model 2215
 emission factor 2230
 equilibrium 2215
 equilibrium payoff vector 2229
 feasible payoff 2223
 finite argument 2218
 Folk theorem 2222, 2224
 game horizon 2215
 global common 2226
 global warming 2225
 individually rational payoff 2224
 model 2215
 most rapid approach (MRAP) 2229
 near irreversibility 2226
 nonlinearity 2226
 payoff 2215, 2223
 player 2215
 second-best problem 2229
 state 2216
 state space 2225
 strategic setting 2226
 strategy 2215
 time cycle strategy 2224
 Dynamic graph calculus 8842
 Dynamic graphs 8842
 Dynamic instability 1543, 2425, 2428
 Dynamic lengthscale ξ 4222
 Dynamic market games 4108
 Dynamic mechanical experiments 6553
 Dynamic mechanism design 5522
 Dynamic memory model 1804
 Dynamic model (developmental) 1882
 Dynamic models 520, 521
 Dynamic networks 5786
 Dynamic programming 1503, 4349, 5202, 6272, 6278, 6280, 9105
 Dynamic programming models 5562
 nested fixed point (NFP) algorithm 5563
 Dynamic programming principle 1952, 6219, 6224
 Dynamic recruitment 262
 Dynamic regime 5022
 Dynamic renormalization group 8543
 Dynamic rule 1880
 Dynamic speed limits 3954
 Dynamic susceptibility 3371, 4221
 Dynamic system 274, 8974, 8975, 8980
 definition 1880
 Dynamic term structure models
 affine models 8793
 empirical evidence 8794
 empirical evidence on the volatility spanning condition 8795
 quadratic yield variation in affine models 8795
 volatility spanning condition in affine models 8795
 Dynamic thinking 4564
 Dynamic traffic assignment 1178, 9430, 9437
 Dynamic traffic assignment solution approach
 analytical modeling approach 9443
 simulation solution 9443
 Dynamic traffic management 3945
 Dynamic travel time 9448
 optimum locations 9450
 spatial travel time measurement 9448
 Spot speed measurement 9448
 Time series models 9448
 Dynamic triggering 1219
 Dynamic weakening 5026
 Dynamical 2846
 Dynamical astronomy 399
 Dynamical complexity 8523, 8530
 Dynamical downscaling 7592
 Dynamical exponents 3851
 Dynamical heterogeneities 5006
 Dynamical minimalism 8422, 8426–8428
 Dynamical modeling, Lu–Klimas magnetic field reversal model 8546
 Dynamical models 6795, 6798
 in biology 1189
 Dynamical noise, autocorrelation function 3588
 Dynamical phase 4194–4196, 4201
 Dynamical properties 1444
 Dynamical robustness, biological models 1190
 Dynamical social psychology 8421, 8432
 Dynamical spectrum 410
 Dynamical strengthening 5025
 Dynamical symmetries 9644
 discrete symmetries 9645
 SO(n) symmetries 9648

Dynamical systems 728, 733, 762, 2233, 3053, 3830, 3832, 3838, 6175, 8199, 8420, 8421, 8423, 8424, 8429, 8432, 8630, 8974
 cocycles 3067
 continuous 4672, 4675
 discrete 4675
 effective 762
 excitable dynamics 733
 fractal geometry 3016
 hybrid 4671, 4672, 4675
 linearizable dynamical system 6185
 multifractal analysis 3024
 simple pendulum 3837
 theory 1437
 Dynamical systems, higher-dimensional 3022
 Dynamical weakening 5025
 Dynamically complete 2778
 Dynamics 525, 1042, 1053–1055, 1057, 4380, 5473, 6655, 9777
 as building block for AC 329
 chaotic 6105
 complex 3020, 3389
 fast 7611
 intricate 7849
 molecular 6994
 nonlinear 3389
 of earthquakes 5022
 reduction of 5488
 scale 3867
 slow 7612
 Dynamism, environmental 7839
 Dynamo 9278
 Dynamorphisms 6798
 dyRange 6398, 6399, 6401
 Dyson series 6745
 Dyson's Brownian process 8728
 Dzyaloshinskii–Moriya interaction 9651

E
 $E = mc^2$ 3274
E. coli 419, 8744
 Min system 8744
 E-Science 8087
 EAC 278
 Early stopping 1816
 Early warning 2371

Early warning systems 1217
 Earth 3279
 orbital parameters 6
 Earthquake 1214, 2449, 2476, 2622, 3824, 3865, 4178, 5022, 6490, 7018
 a possible model 2552
 Aegean Sea EQ, 2001 2626
 as a critical phenomenon 2627
 Athens EQ, 1999 2627
 characteristic frequency 2664
 Chi-Chi EQ, 1999 2629
 critical slip distance 2552
 direct-search location 2457
 early-warning 2449, 2467, 2471
 emergency response 2451
 epicenter 2450
 Eratini–Egio EQ, 1995 2626
 estimate of source processes 2545
 estimate of source time functions 2545
 forecasting 4179
 Great Chilean EQ, 1960 2627
 Guam (Marianas) EQ, 1993 2623, 2627
 Hawaii region 2663
 hazard assessment 2451
 hypocenter 2450
 infrasound 4839
 Kobe EQ, 1995 2623, 2627–2629
 Kozani–Grevena EQ, 1995 2626, 2627
 large earthquake 2542
 linearized location 2457
 local magnitude methods 2665
 location 2449
 Loma–Prieta EQ, 1988 2623
 Loma-Prieta EQ, 1989 2626
 magnitudes 2664
 main phase 2542
 measurements of initial parts 2542
 model with small nucleation zones 2541
 moment magnitude 2664
 nucleation zone 2539
 objective function 2450
 observations of initial rupture processes 2542
 observatory message 2660
 ordinary phase 2542
 origin time 2450
 P-wave magnitude scale 2665
 P-wave velocity pulses 2539, 2540

- P-waves [2662, 2666](#)
 preparedness [4179](#)
 probabilistic location [2455](#)
 real-time location [2471](#)
 rupture growth [2541](#)
 rupture velocity [2539](#)
 S-waves [2664](#)
 schematic source models [2541](#)
 seismic swarm in Izu Island region, 2000 [2625](#)
 size [2451](#)
 slow [2492, 8851](#)
 small [2543](#)
 source location computing [4845](#)
 source parameters [2657, 2664](#)
 source time functions [2550](#)
 Spitak (Armenia) EQ, 1988 [2627](#)
 Spitak (Armenia) EQ, 1989 [2623](#)
 strength profile [2553](#)
 Strofades EQ, 1997 [2626](#)
 submarine earthquake [2476](#)
 theoretical models [2539](#)
 theta [2664](#)
 Tokachi-Oki EQ, 2003 [2627](#)
 tsunami warning [2667, 2669](#)
 tsunamis [2658, 2659](#)
 velocity pulse [2539](#)
 waveforms [2541](#)
- Earthquake catalogs [2515, 7859](#)
 Earthquake clustering [2349, 2351, 2352, 2354, 2355, 2357, 2358, 2360, 2362, 2365, 2366](#)
 Earthquake clusters [1216, 2363](#)
 waveform [2549](#)
 Earthquake complexity [2484](#)
 Earthquake damage [1218](#)
 Earthquake damage detection [2373](#)
 literature review [2373](#)
 Earthquake doublets [7927](#)
 Earthquake dynamics [2358, 2439, 2592](#)
 Earthquake early warning (EEW) systems [2396, 2516, 2541, 9593](#)
 regional [2396](#)
 site-specific [2396](#)
 Earthquake engineering [1217, 2422, 2424](#)
 Earthquake forecasting [1217](#)
 Earthquake geodesy [1691](#)
 Earthquake-induced disasters [2419](#)
- Earthquake infrasound
 case study Chile 2005 [4844](#)
 case study China 2001 [4843](#)
 case study Peru 2001 [4842](#)
 Earthquake light [2622, 2623, 2627](#)
 Earthquake location [1215, 2512](#)
 Earthquake magnitude [1215, 2506, 2514](#)
 Earthquake monitoring [1215](#)
 in the digital era [2507](#)
 instrumentation [2500](#)
 regional and local networks [2510](#)
 Earthquake networks [1216, 2530, 2532–2537](#)
 connectivity distribution [2531, 2533](#)
 hierarchical organization [2531, 2535](#)
 scale-free [2532–2535](#)
 small-world [2532–2534, 2536](#)
 small-worldness [2535](#)
 Earthquake nucleation [1218](#)
 Earthquake nucleation process [2538](#)
 critical slip distance [2539](#)
 initial crack [2540](#)
 models [2541](#)
 preslip model [2541](#)
 Earthquake physics [1218](#)
 Earthquake prediction [2538, 2621, 2622, 4179, 7854](#)
 Earthquake prediction and forecasting [1215](#)
 Earthquake quantity [5021](#)
 Earthquake rupture process [2478, 4436, 4446](#)
 angle of slip, or rake angle [4441](#)
 asperities [4446, 4447](#)
 branching fault [4449](#)
 constitutive law (i. e. a friction model) [4446](#)
 directivity [4450](#)
 directivity effect [4450](#)
 dynamic rupture model [4435, 4445, 4446](#)
 dynamic stress drop [4436](#)
 dynamics of earthquake rupture [4439](#)
 earthquake magnitude [4441](#)
 earthquake scaling laws [4446](#)
 earthquake source dynamics [4449](#)
 earthquake-source inversions [4445](#)
 earthquake source-scaling [4464](#)
 elasto-dynamic equations of motion [4446](#)
 fault dimensions [4445](#)
 fault-zone maturity [4448](#)
 finite-source rupture model [4445, 4446](#)

- geometrical fault complexity 4448
hypocenter 4445, 4450
hypocenter location 4447
kinematic rupture model 4435, 4445
left-lateral strike-slip 4441
local slip-functions 4445
moment magnitude 4443
moment magnitude, M_w 4465
multi-scale dynamic simulations 4468
normal faulting 4441
physics of earthquake rupture 4437
point of rupture nucleation 4450
radiation pattern of P- and S-waves 4445
representation theorem 4445
right-lateral strike-slip 4441
rise time 4436, 4445
rupture duration 4436
rupture finiteness 4440
rupture nucleation 4450
rupture velocity 4436, 4445
scale-invariant static stress 4443
seismic moment 4436, 4441
seismic potency 4443
self-similar constant stress-drop scaling 4436
self-similar earthquake scaling 4465
self-similar earthquake source scaling 4443
slip distribution 4436, 4445
slip heterogeneity 4446
slip vectors 4441, 4445
slip-velocity function (slip-rate function) 4436, 4445
source properties 4439
source-scaling relations 4446, 4465
static stress drop 4436, 4443
style-of-faulting 4445
thrust faulting 4441
velocity-pulses 4450
Earthquake scaling laws 1219
Earthquake size 2474–2477
Earthquake source 1219, 2474, 2479
 seismic methods 2662
Earthquake spectra 2583
Earthquake statistics 2350
Earthquake swarms 2353
Earthquake thermodynamics 2648
Earthquake visualization 2360
- Earthquake waveforms *see also* Earthquake
 slip area 2550
Earth's interior 1215
Earthworm 2402
Easley and O'Hara's model 5398
Eastern Europe 2820
EBITDA 7843, 7845
EBS 5409
EBS (electronic broker system) 5395
Eccentric anomaly 6676
Echo 115
Eckmann–Ruelle conjecture 3023
ECM 532, 536
ECNs *see* Electronic crossing networks
Ecobot 3690
Ecoinformatics 2708
Ecological asymmetry 2706
Ecological city 7957
Ecological complexity 2697
 describing solutions 2700
 general types of phenomena 2698
Ecological diversity 2708
Ecological drift 2706
Ecological economics 8998
Ecological energetics 2698
Ecological information content 2699
Ecological information exchange 2699
Ecological kinetics 2699, 2701
Ecological network 1891
Ecological processes 2742
Ecological psychology 1901
Ecological relationships 1890
Ecological symmetry 2706
Ecological systems 1889, 2697, 9104
 chemical work 2698
 energy flow 2698
 entropy 2700
 feedback loops 2702
 genetic information exchange 2699
 organisms 2698
 stability 2707
Ecological webs 7517
Ecologically sustainable development 3111
Ecology 8941
 biological fractals 3780
 spatial correlations 3792
Economathematics 2793

- Econometric modeling 9035
 Econometrics 3389, 9034
 Economic city 7957
 Economic determinants of volatility 8808
 Economic dualism 2284
 Economic efficiency 1661
 Economic impact of climate change 1091
 Economic modeling approaches 177
 Economic sector 2284
 Economic temperatures 2819
 Economic theory 9432
 Economics
 agent-based modeling 177
 and economic modelling 8989
 Economy 8941
 Econophysics 183, 2793, 2801, 8413
 Ecosystem
 ascendancy 2708
 ecological diversity 2708
 Ecosystem shifts 2724
 Ecosystems
 energy flows 2704
 entropy 2707
 information theory 2707
 interacting species 2728
 material flows 2703
 nonlinear dynamics 2705
 statistical mechanics 2706
 Eddy current 5030
 Edge artifacts 10032
 Edge betweenness 1150
 Edge clustering coefficient 1151
 Edge orbits 4827
 Edges 1725, 6240, 8246, 8267, 8270, 8322
 contours 1735
 curved 1725
 discontinuities 1730
 incident 6240
 Edgeworth, F. 1510
 Education 1873
 Education policy 7061
 Educational robotics 4649
 Edwards–Anderson model 6418
 Edwards–Anderson order parameter 4214
 Edwards Hamiltonian
 polymer physics 6815
 Edwards–Wilkinson equation 2031
 EEG 1555, 8004
 EEPAS model, precursory swarm 2568
 Effect size 8001
 Effective bonds 6840
 Effective conductance 1405
 Effective conductivity 1397, 1400–1402, 1407, 1409
 effective medium approximation 1401, 1402
 Hashin–Shtrikman bound 1401
 Hashin–Shtrikman bounds 1401
 in one dimension 1406
 (parallel) bound 1401
 parallel bounds 1407
 series 1407
 upper bound of chayes and chayes 1407
 Effective dimensionality 8825, 8846
 Effective Hamiltonian 6694
 Effective information 1433
 Effective mass 5770, 7403, 8576
 Hamiltonian 7483
 Effective measure complexity
 Grassberger's 495
 Effective medium approximation 1395, 1397, 1408, 1409
 Effective medium theorie
 Curie–Weiss effective field 3742
 Effective medium theory 2682, 3738
 effective homogeneous medium 3742
 Effective permeability 6576
 Effective prediction domain 7078
 Effective properties 1396
 Effective resistance 1405
 Effective stress 2681, 10049, 10050
 Effective temperature 2033, 5008
 Effectiveness, of neuro-fuzzy systems 6095
 Effectivity 1521
 Effector genes 1184
 Effects of snow cover on frozen soil 1714
 Effectual bottleneck 9374
 Efficiency 2650, 3327, 8238, 9934, 9936, 9937
 Efficient 3449
 Efficient equilibria 4107
 Efficient market believer (EMB) 97
 Efficient market hypothesis 3438, 3449, 3450, 3454
 Egalitarian solution 1662
 Egalitarianism 9934, 9936, 9937

- Ego-centric 8311
 Ego-centric data 8315
 Ego-centric network data 8315
 Ego-network 8240
 Egorov theorem 6758, 6759
 Egypt 7844
 Ehrenfest urn 8769
 Ehrenfest wind-tree model 995
 Eigenfrequencies 5727
 Eigengap 5278
 Eigenstate, degenerate 5770
 Eigenvalue 405, 6593, 6597, 6651, 6761, 8949
 Eigenvalue elasticity analysis (ELA) 8949
 Eigenvalue problem 9916
 Eigenvector 405
 Eight-point algorithm 4752, 4755
 Eight-shaped orbit, n -body problem 5966
 Eight shaped three-body solution, n -body problem 5964
 Eikonal equation 6220, 6466–6468
 Einstein-deSitter solution 3273
 Einstein formula, biological fractals 3785
 Einstein relation 990, 991, 3371, 3936
 Einstein, Albert 6664, 6805
 El Farol bar problem 4977
 El Niño 4
 El Niño-Southern oscillation (ENSO) 1075
 ElarmS 2398
 Elastic 7826
 Elastic approximation 2022
 Elastic backbone 3853
 Elastic constants 698
 Elastic expansion 9770
 Elastic exponent 2831
 Elastic half space 5028
 Elastic manifold 6414
 Elastic percolation networks 6563
 Elastic rebound 4268
 Elastic rebound theory 1693
 Elastic strain 698
 Elastic wave 2687
 attenuation 2693
 dispersion 2693
 Elastic wave propagation 2523
 Elasticity 559, 1128, 8959, 8964
 Elastodynamics 6721
 Elections 3304, 6807
 presidential 3304
 senatorial 3304
 Electric utility models 685
 Electrical conductivity 1399
 Electrical dissipative structures 9718
 Electrical networks, complex 6189
 Electricity market 9015
 Electro-chemical potential 7311
 Electro-kinetic effect 2621, 2632
 Electrodipole transport 8592
 Electrodynamics 6663
 Electroencephalograms 6099
 Electroencephalography (EEG) 1436
 Electromagnetic signals 1216
 Electromechanical digital computing 5477
 Electromotive force 32
 Electron-electron interactions 7343
 Electron gas 7404, 8576
 Electron layer 8577
 Electron runaway 35
 Electron shelving detection, transition 7230
 Electron shelving, quantum computing 7230
 Electron tunneling 9715
 Electronic brokers 5395
 Electronic communications networks 5409, 9565, 9567
 Electronic crossing networks (ECNs) 5395
 Electronic diary 8003
 Electronic ecology 3793
 Electronic elections 8387
 Electronic structure 1309, 5751, 5754
 Electroosmosis 5578
 Electrophoresis 5579
 Electrostatic aggregation 9803
 Electrostatic charge, polymer physics 6816
 Electrostatic shocks 34
 Electrowetting on dielectric 5584
 Elek G 781, 789
 Elementary granules 7788
 Elementary Jacobi rotations 7439, 7457
 Elementary modes 5536
 Elementary sets 7800
 Elevated CO₂-concentration
 changes in food composition 1102
 nitrogen content in plants 1103
 Eliasson 6667

- Elitist strategy 4874
 Ellipsoidal geodesics 5444
 Elliptic 2262, 4520
 Elliptic curve 7095
 Elliptic family 6437
 Elliptic orbits 6437, 6447
 Elliptic resonant families 6439
 Elliptic restricted three-body problem 6440
 Ellipticity 6218, 6220
 uniform 6219
 Elman network 1822
 ElMo 5542, 5544
 EM 5743
 Embedded interval type-2 fuzzy sets 4014
 Embedded state (conceptual state) 4348
 Embeddedness 8237
 Embeddedness of the observer 1875, 1879
 Embedding 374, 375, 390, 8893
 Embedding dimensions 7998
 Embedding space 3879
 Embedding theorem 8901
 Embodied systems 1111
 Embodiment 1888, 2845, 4901
 Embryogenesis 525
 Embryonic development 731
 fruit fly Drosophila 727
 Embryonic period 1900
 Embryonics project 930
 Emerge 2847
 Emergence 114, 1056, 1269, 1558, 1876, 3271,
 4325, 4330, 4331, 4335, 4633, 6477, 7994, 8040,
 8366, 8367, 8369, 8407, 8420–8423, 8426–8428,
 8432
 adaptive tension 8367
 downward causality 1440
 enabling rules 8367
 heterogeneity 8367, 8370
 temporal emergent behavior 1280
 Emergence of a new flow interruption 9398
 Emergency 3110
 Emergent behavior 1336, 9052
 Emergent defect dynamics in cellular automata
 2991
 Emergent logic 5293
 Emergent pattern 4898
 Emergent phenomena 1282
 Emergentism 1538
 Emerging behaviors, agent-based modeling 187
 Emissions 9457
 CMEM 9458
 VT-Micro model 9458
 Emissions from focal regions 2622
 co-seismic signal 2623, 2625, 2630, 2632
 co-seismic wave signal 2623
 higher frequency electromagnetic emission
 2627
 pre-seismic appearance of EM signals 2623
 pre-seismic signal 2632
 ultra low frequency (ULF) anomaly 2626
 VHF signal 2623
 VLF emission 2627
 Emjoule 2705
 EMM 8802
 Emotion 1903, 2242, 2243
 Empedokles 6805
 Empires 4613, 4615
 Empirical congested pattern 9367
 Empirical congested traffic 9406
 Empirical criteria for traffic phases 9308
 Empirical features of traffic breakdown 9283
 Empirical ground-motion prediction equations
 4440
 Empirical mode decomposition 3766
 Empirical object set 7461
 Empirical relationships, QSAR 7072
 Empirical traffic congestion 1179
 Empirical trajectory 6479
 Empiricism 9064–9066
 Enantiomers 3284, 3286, 3288
 Enclosed area distribution 6528
 Encoding 1782
 Encrypted functions 5612
 Enculturation 1926
 End-to-end distance 6840
 Endocytosed 9752
 Endogeneity 5563, 7021
 Endogeneous complexity 4102
 Endogeneity, control function 5563
 Endogenous complexity 4112
 Endogenous matching model 4110
 Endogenous threats, mobile agents 5610
 Endogenous variable 713
 Endomorphic agents 352

Endomorphism
 ergodic 2935
 Endosome 9752
 Endowment function 6011
 Endpoint 2046
 Energy 1493, 1500, 3270, 3276, 3281, 6408, 6596, 6805
 seismic energy 2474
 total 1499
 Energy approach 700
 Energy balance 2587
 Energy band 6691
 Energy barrier 1310
 Energy consumption 9457
 Energy decay rate 6122
 Energy density 10000
 Energy dissipation rate 3644
 Energy equality, Navier–Stokes equations 5949
 Energy equipartition 5994, 8482
 Energy flow 3268, 3271, 3282
 ecological systems 2698
 ecosystems 2704
 Energy-flow diagnostics 3280
 Energy flux 10000
 Energy gap 9685
 Energy landscape 4910
 Energy loss 4379
 Energy magnitude 2483, 2486
 Energy minimization methods 1254
 Energy moment ratio 2586, 2589
 Energy optimization
 biological fractals 3784
 Energy rate density 3277, 3279, 3281
 Energy release 2650
 Energy release rate 2593
 Energy shell 2262, 4531
 Energy systems 9015
 Engagement 7064
 Engineering 291, 2857
 Engineering demand parameters 2418
 Engineering of systems 8377
 Enhancement of fluctuations 1548, 5723, 5734
 Enigma machine 5477
 ENO 10033
 ENO-wavelet transforms 10040

Ensemble approaches
 bagging 1995
 boosting 1996
 Ensemble averaging 8589
 Ensemble axiom 5627
 Ensemble methods 1841, 5317
 Ensemble of random 7919
 Ensemble, stress based 5015
 Enslaving principle 7992
 Entangled melt, polymeric fluid 6826
 Entangled polymer dynamics 6821
 Entanglement 1012, 1014, 1880, 1906, 6411, 6851, 9134
 polymer physics 6812
 quantum mechanics 7375
 Entanglement assisted capacity 7393
 Enthalpic elasticity 6559
 Enthalpic forces 7030
 Entrainment 7606, 7610, 7614
 mutual 7610
 Entrepreneurship 2284
 Entropic effects 2841
 Entropic elasticity 6559, 7033
 Entropic forces 7030
 Entropic profile
 homeobox protein 500
 rodent homeodomain 500
 Entropic springs 2840, 7040
 Entropy 728, 1046, 1047, 1049, 1430, 1830, 2444, 2804, 2859, 2860, 2870, 2874, 2878, 2944, 3040, 3055, 3086, 3271, 3276, 3353, 3812, 4713, 4717, 4821, 4897, 7025, 7731, 8715, 9249, *see also*
 Mean dimension
 biomolecular sequence 494
 completely positive 2928
 conditional 495
 DNA sequence 495
 E. coli tRNA sequence 496
 ecological system 2700
 ecosystems 2707
 ergodic theory 3071, 6942, 6943
 K₂ 3509
 Kolmogorov 3508
 Kolmogorov–Sinai 4986
 measure-theoretic 953, 3040
 of a measure 3018
 of a subshift 790

- of cellular automata 3004
 topological 953, 3040
 Venn diagram 498
- Entropy formula 4737
 Entropy maximization 1047, 1049, 1050, 4627, 9452
 Entropy model 7995
 Entropy of symbolic extensions 968
 Entropy principle 8936
 Entropy production 1006, 2861, 6953
 ergodic theory 6941
 Entropy spectrum 3024
 Entropy theory of cellular automata
 cone entropy 3007
 directional entropy 3006
 entropy geometry and expansive subdynamics 3008
 Lyapunov exponents 3005
 Entropy vanishing mechanism 4225
 Enumeration algorithm 5626
 Envelope 2412, 7915
 Envelope broadening 7916
 Envelope noise 6147
 Environment 206, 4790, 7521, 7837, 7842, 7845
 complex-dynamic 7837
 complex-static 7837
 difference between simulated and simulation 189
 discontinuous 7837
 disturbed-reactive 7837
 energy and climate changesee 8989
 extensional; transtensional 2608
 independent-dynamic 7837
 independent-static 7836
 placid 7836
 placid-clustered 7837
 role for simulations 189
 role in agent-based modeling 186
 surprising 7837
 synthetic 185
 transpressional; compressional 2609
 turbulent field 7837
 Environment mediated interaction 193
 Environment of evolutionary adaptedness 1925
 Environmental applications 7062
 Environmental footprint 7843
 Environmental remediation 417
 Environmental scanning 7838
 Environmental stochasticity 8777
 Environmental systems 9015
 Envy-ensuring 3332
 Envy-freeness 1680, 3327
 Envy-possible 3332
 Enzyme reactions 858
 Enzymes 723, 2090, 9104
 Epicenter 2474
 Epicycles 6663
 Epidemic communication *see* Gossip
 Epidemic models 6060, 6778
 susceptible–infected–recovered 6060
 susceptible–infected–susceptible 6060
 Epidemic simulations 7577
 Epidemic spreading, percolation 3790
 Epidemic threshold 4660
 Epidemics 6498
 Epidemiological system 9035
 Epidemiology 4577, 9042
 biological fractals 3780
 system dynamics 4563
 system dynamics studies 4571
 Epidermal growth factor receptor (EGFR) 2121
 Epigenesis 930
 epigenetic inheritance 1925
 predetermined 1919
 probabilistic 1919
 Epigenetic states 527
 Epigenetics 1193, 1196, 3971
 Epigenetics 527, 542
 Epigenetics robotics 2856, 4648
 Epilepsy 627, 629, 639
 photosensitive 1627
 Epileptic seizures 639
 Epimerization 3284, 3290, 3291
 Epipolar constraint 4752
 Episodic representations 2320
 Epistasis 9106
 Epistatic miniaarray profiles (E-MAP) 9109
 Epistemological complexity 1906
 Epithelial 532
 Epithelioid 532
 Epoch 1815
 Epoxidation
 catalyst 1329
 polyols 1329

- ε -Free Rokhlin lemma 3058
 ε -Insensitive SVR 4086
 ε -Insensitive value 4092
 $\varepsilon_p(n,k)$ 703
 Equal differential-time 2407
 Equal treatment 1685
 Equation 3874, 6596, 8114, 8733, 8734, 8738, 8740, 8741
 Boussinesq 8481
 chemical Fokker–Planck 8738
 chemical Langevin 8738
 chemical master 8734
 continuity 3874
 differential 6103, 6104
 diffusion 8740
 Dirac 3875
 dispersive 2041
 dynamics 3867, 3872
 Einstein 3855
 Euler 3874
 Euler–Lagrange 3866, 6600
 evolution 8481
 Fokker–Planck 6105, 6110
 geodesic 3870
 Hamiltonian 6588, 6589, 6603
 integrable 8481
 Kadomtsev–Petviashvili (KP) 8481
 Kirchhoff 3855
 Klein–Gordon 3875
 Korteweg–de Vries (KdV) 8481, 8511
 motion 3869
 nonlinear 8481
 nonlinear Schrödinger (NLS) 8481
 Pauli 3875
 reaction-diffusion 8740
 reaction-diffusion master 8741
 reaction rate 8733
 Schrödinger 3872
 sine-Gordon (SG) 8481
 spatial chemical Langevin 8740
 Equation-based models
 dynamical 4613
 second-order dynamics 4614
 sufficient unit 4622
 Equation of motion 377, 8105
 polymeric fluid 6825
 Equation of state 4386
 Equation with infinitely many variables 6237
 Equi-partition set, density 6296
 Equicontinuity point 9236
 Equicontinuous 9236
 Equicontinuous function 3256
 Equicontinuous point 9250
 Equicontinuous system 2234
 Equidistributed 3040, 3041, 3043
 Equidistribution of periodic points 959
 Equilibrium selection 3194
 Equilibrium 202, 1042, 1044, 1045, 1886, 2268, 4791, 4998, 7165, 7622, 7631, 7843, 7849, 8698, 9225
 Aubry set 4551
 Bayesian 4791
 belief free 7627
 communication 7622, 7625
 condition D1 8130
 correlated 5180, 7622, 7624, 8698, 8704
 CURB 5181
 divinity 8130
 ε -equilibrium payoff 8701
 ergodic theory 6945
 extensive-form correlated 8704
 intuitive condition 8130
 joint payoff 3178
 λ -discounted ε -equilibrium 8701
 limsup ε -equilibrium 8701
 mechanical 4998
 minimal prep sets 5181
 Nash 4791, 5179, 8127
 normal-form correlated 8704
 perfect 7618
 perfect Bayesian 8133
 pooling 6985, 8128
 public 7625, 7626
 pure equilibria 3178
 quantile response 5181
 self-confirming 5181
 separating 6985, 8128
 sequential 7622
 sociological factors/bounded rationality 4799
 strategic stability 8130
 subgame (Bayesian) perfect 6979
 subgame perfect 4797
 T-stage ε -equilibrium 8701

thermal 4999
 uniform ε -equilibrium 8701
 Equilibrium assignment, all-or-nothing 9436
 Equilibrium distribution
 ergodic theory 6942
 Equilibrium in beliefs 8656
 Equilibrium joint plan 7642
 Equilibrium machines have one state each 4107
 Equilibrium refinements 8128
 Equilibrium selection 3197
 Equilibrium selection argument 4103
 Equilibrium state 3055
 ergodic theory 6939, 6945
 Equilibrium statistical mechanics 4909
 Equipartition theorem 8942
 Equipartition property 6944
 Equitability 3327, 3330
 Equity 3449
 Equity premium
 constant 3457, 3462, 3469
 ex ante 3456, 3462, 3464
 ex post 3456, 3462, 3464, 3467
 puzzle 3456, 3457, 3462
 structural breaks 3465, 3469
 time-varying 3457, 3469, 3472
 trends 3465, 3469
 Equivalence class 6288
 attribute 1866
 Equivalence principle 1513
 Equivalence relation 805, 5738, 6288
 definition 6287
 Equivalent body force 9902
 Equivalent chain 6840
 Equivariance 5307
 infinitesimal 5484
 Equivariant bifurcation theory 6177
 Equivariant branching lemma 5305
 Equivariant momentum maps 5484
 Equivariant orbits 5963
 Equivocality 7839
 environmental 7837
 Equilibrium
 undominated nash equilibrium 4797
 Erdős and Rényi 3856
 Erdős–Rényi model 4488
 Erdős–Rényi graph 8321, 8323

Erdős–Rényi network 502
 motif information 508
 Erdős, Paul 8277
 Ergodic 385, 2922, 3040, 3054, 4589, 4985
 Ramsey theory 3043
 theorem 3041
 unique 3043
 Ergodic decomposition 2924
 Ergodic decomposition theorem 3054, 3058
 Ergodic flows 3059
 Ergodic hypothesis 2919
 Ergodic invariant measure 3017
 Ergodic measures 5457
 Ergodic probability 3017
 Ergodic properties 8590
 Ergodic Ramsey theory 3091
 Ergodic system 402, 989, 992
 Ergodic theorem 3054
 Ergodic theory 2982, 3017, 3053, 4983
 associated flow 3065
 critical dimension 3072
 disjointness 3076
 entropy 3071
 fractal geometry 3015
 full groups 3065
 Hausdorff dimension 3017
 infinitely divisible stationary processes 3076
 L^∞ -spectrum 3069
 maharam extension 3065
 mixing 3062
 mixing recurrence 3061
 multiple recurrence 3061, 3063
 non-singular transformations 3055
 nonsingular joinings 3073
 normalizer of the full group 3066
 orbit 3064
 orbit classification of type III systems 3065
 outer conjugacy problem 3066
 poisson suspensions 3076
 polynomial recurrence 3063
 pressure and equilibrium states 6939
 quasi-invariance 3069
 symmetric stable processes 3076
 topological group 3064
 topological pressure 3018

- Ergodicity 953, 3043, 6232, 7164, 7165
 quantum 7167
 unique 2923
- Ergodicity error 1882
- Erikson 1884, 1898, 1905
- Error 2450, 4186
 diagram 3303, 4186
 numerical 6997
 quantum information processing 7388
- Error-correcting code
 quantum information processing 7389
- Error-correcting output codes 5323
- Error correction 7090, 7256
 quantum 7090, 7112
 quantum computing 7242
- Error correction model 2758, 2759, 2762
- Error function 1815, 1818
- Error surface 1818
- Error syndrome 7327
- Errors/trembles in output 4107
- Eruption 9876
 signature, volcanic activity 4851
- Eruptive volume 9832
- Escape-rate formula 989, 1000, 1001
- Escape route 6490
- Escort distribution 2870
- Essential matrix 4752, 4755, 4757
- Essential tremor 627, 630
- Estimated Euclidean homography 54
- Estimation 216
- Estimation methods
 characteristic functions 8799
 efficient estimation of general continuous-time processes 8800
 efficient method of moments 8802
 estimation from option data 8805
 estimation via discrete-time model specification or approximation 8796
 filtering the latent state variable directly during estimation 8797
 indirect inference 8801
 Kalman filter 8797
 Markov chain Monte Carlo 8804
 maximum likelihood with characteristic functions 8800
 methods accommodating the lack of a closed-form transition density 8798
- particle filter 8805
 realized volatility 8808
 reprojection method 8789, 8803
 simulated maximum likelihood 8801
 simulated method of moments 8800
- Estimator 6996
 consistent 6997
 unbiased 6997
- Estrogen receptor (ER) 2130, 2149, 2168
- ETAS model
 ground process 2567
 Hawkes' processes 2566
 process without ancestors 2567
- Ethical theory, human–robot interaction 4650
- Ethnography 4616, 4627
- Ethylene epoxide 1329, 1331
- Etna 9787
- Euclidean algorithm 10027, 10028
- Euclidean coordinate 46
- Euclidean geometry 272, 279
- Euclidean lattices, high-dimensional 623
- Euclidean-space 44
- Euclidean space of vectors of state 1619
- Euclid's Elements 3840
- Euler equations 3615, 3644, 9971, 9991, 10000
- Euler–Hill symmetry 5973
- Euler hydrodynamic equation 4382
- Euler–Lagrange equation in integrated form 5443
- Euler–Lagrange equations 10037, 10038
 reduced 5495
- Euler–Poincaré equations 5492
- Euler–Poincaré reduction 5492
- Euler pole 4257
- European Modernity 8196
- Evacuation 3110, 3134, 3137, 3143, 6483
 arching 6484
 clogging 6484
 decision matrix 3112
 egress 6483
 jamming 6484
 planning process 3131
 precautionary 3118, 3130
 pushing 6484
 route 3127
 social issue 3138
 stampede 6483
 trigger 3114

- Evacuation dynamics 3143
 Evacuation management 1180
 Evacuation process 3143, 3165
 simulation 3165
 simulation example 3166
 Evacuation time, calculation 3164, 3165
 Evaluation 5351, 8698
 discounted evaluation 8700
 finite-horizon evaluation 8700
 limsup evaluation 8700
 Evaluative response 2243
 Evanescent wave 7293
 Evaporation/condensation 6961, 6963
 Even shift 8892
 Event-event correlations 2532
 Event history analysis 8313, 8314
 Eventual set, definition 6290
 Evidence-based medicine 9092
 Evidence-based treatments 8003
 Evidence theory 4049
 Evidence, role in neoclassical economics 181
 Evo-Devo 1917
 Evolution 1553, 1900, 1916–1922, 1924–1926,
 1928, 2854, 3270, 3278, 3282, 3375, 3865, 6639,
 8040
 artificial metabolic network 505
 chemical 338
 extrinsic 339
 in materio 3221, 3222, 3224, 3225, 3228
 information in networks 502
 informational complexity 505
 intrinsic 339
 number of nodes 505
 of complexity 505
 of cooperation 3213
 of the systems approach 8975, 8987
 rule 5524
 strategies 121
 theory, biological fractals 3780
 Evolution equation 1487, 8926, 8929
 approximately controllable 1489
 exactly controllable 1489
 null controllable 1489
 Evolutionarily stable strategy 6643
 Evolutionarily stable strategy (ESS) 3176, 3179
 Evolutionary 2845, 3243
 Evolutionary algorithm 6491
 Evolutionary approach 2407
 Evolutionary biology 1887
 Evolutionary calibration 6479
 Evolutionary computing 121, 4873
 Evolutionary dynamic
 best response dynamic 3183
 Brown–von Neumann–Nash 3183
 logit dynamic 3183, 3189
 Markov process 3193
 mean dynamic 3183
 perturbed best response dynamic 3189
 projection dynamic 3187
 replicator dynamic 3176, 3183, 3187, 3188,
 3190, 3192
 Smith dynamic 3191, 3192
 zero-sum game 3190
 Evolutionary game 4097
 Evolutionary game theory 125, 5677, 6640
 Evolutionary granular cognitive neural network
 4405
 Evolutionary minority game 5590
 Evolutionary models
 cooperation 4618
 dual inheritance 4618
 Evolutionary optimization 6490
 Evolutionary paths, motifs as fingerprints 5698
 Evolutionary pressure 720
 Evolutionary programming 121
 Evolutionary robotics 2855
 Evolutionary stable strategies 8667
 Evolutionary strategy 2407
 Evolutionary system, open-ended 341
 Evolvability 735
 Evolved spandrels 5699
 Evolving clustering 3245
 Evolving fuzzy classifiers 3247
 Evolving fuzzy controllers 3249
 Evolving fuzzy systems 3244
 Evolving system 3243
 Exact 2929
 Exact control 732
 Exact controllability 4811
 Exact diagonalization
 Slater determinants 7318
 Exact diagonalization of the many-electron
 Schrödinger equation 7318
 Exact dimensional 961

- Exact solution 5144, 5145, 5147, 5149, 5156, 5157
 Exactly controllable 3528
 Exactly solvable set 4502
 Example 6602
 of a Hamiltonian 6596
 Exaptation 4165
 Excess volatility 98
 Exchange 8586
 Exchange and correlation
 finite temperature 8586
 magnetic field 8586
 Exchange-correlation 8577
 energy 8582
 Exchange economy 1512
 Exchange energy 8576, 8582
 Exchange energy J 7320
 Exchange interaction 7353
 Exchange of stability 5305
 Exchangeability 456
 Excitability 1354
 Excitable 836
 Excitable chemical medium 9705
 Excitable lattices 9709
 Excitable media 886, 3337, 3349
 Excitation, recurrent 6106
 Excitatory, synapses 6102
 Excludability 7637
 Excluded volume 1444, 6505
 calculation 6508
 continuum percolation 6508
 isotropic networks 6514
 polymer physics 6815
 Excluded volume effect 3884, 6851
 Exclusion principle 879, 884
 Executive functions 1904
 Exhaustive algorithms 1799
 Exit route 3126
 Exo-planets 397
 Exogeneity 7021
 Exogenous 4104
 Exogenous factors 2796
 Exogenous threats, mobile agents 5610
 Exogenous variable 713, 1855
 Exotic phase 9701
 ExPa 5544
 Expanded congested patterns 9374
 Expanded traffic congested pattern 9507
 Expanding circular pattern 9718
 Expansibility 2861
 Expansions 5451
 Expansive 9238
 Expansive subdynamics of cellular automata 3008
 Expansive system 9254
 ExPas and ElMos 5544
 Expectation value 7371
 Expectations 4105
 bounded rationality 3374
 rational 3374
 Expected losses 2418
 Expected value 3317
 Experience curve 1967
 Experiment
 evacuation 3152
 two-slit 3871
 Experimental design 2452, 2456, 2465
 fuzzy system models 4091
 Experimental fundamentals
 a brief history 7274
 channels 7275
 detection systems 7276
 sources 7275
 truly quantum random number generators 7278
 Experimental implementation of BB84 protocol
 phase coding 7278
 polarization coding 7278
 Experimental methodology 2793
 Experimental petrology 9795
 “Experiments” in social phenomena 2795
 Explanation 5196, 9069–9073
 Explanation-based learning 5188, 5193, 5196
 Explanatory gap 1118
 Explicitly simulated collision 330, 331
 Exploration 8709, 8715
 Exploration process 8716
 Explorer 2075
 Exponent 1131, 1134, 6243, 6410, 7826
 apparent 6999
 complex 3865
 correlation length 1131
 Diophantine 3031, 3033
 dynamical 1131
 multiplicative 3035
 multiplicative Diophantine 3035

- roughness 1131
 velocity 1131, 1134
- Exponential Boltzmann–Gibbs function 2805
 Exponential distribution 2804, 2823, 6003
 Exponential family 8230
 Exponential function 2801, 2803, 2813
 Exponential growth 1054, 4921
 Exponential random graph model 8275, 8317, 8319, 8320
 Exponential set, definition 6302
 Exponential smoothing 4116
 Exponential stability 5991, 8618
 Exponentially small 6324
 Exponents of random power law graphs 7499
EXPTIME 5468
 Extended analog computer (EAC) 277, 286, 3357
 Extended Kalman filter 6076
 Extended memory 2758, 2763
 Extended phase space 6177
 Extended self-similarity 3658
 Extended similarity scaling 8537
 Extended systems 4904
 Extensible markup language (XML) 4305
 elements 4309
 schema 4309
 tags 4309
 unique 4309
 Extension functor 4341
 Extension group 8555
 Extension hardening, entangled polymer dynamics 6822
 Extension machines 7042
 Extension principle 4071
 fuzzy logic 4001
 Extension problem 8906
 Extension theorem 3260
 Extensive form 1510, 1512, 4099
 Extensivity 2862
 Extent of reaction 556
 Exterior covariant derivative 5504
 External dynamics 2849
 External (or barotropic) modes 6211
 External parameters 6318
 External perimeter 3709, 3853
 External predictive accuracy, QSAR models 7082
 External predictive power, QSAR models 7081
 Externally validated QSAR model 7077
 Extinction thresholds 2723
 Extracellular matrix (ECM) 525, 914
 tumor cell migration 917
 Extrapolation techniques 7836
 Extrasolar planetary systems 6446
 Extrasolar systems 6428
 Extrema 714
 Extremal 3003
 Extreme event 3771
 Extreme pathways 5536
 Extreme value distribution 3319, 3408
 Extreme value statistics 3773, 7868
 Extrinsic evolution 339
- F**
- Fabric weakening 658
 Fabry–Perot etalons 6126
 FACE *see* Free air carbon dioxide enrichment
 Facet, fuzzy logic 3989
 Facilitated models 4226
 FACS (Free agents on a cellular space) 7967
 Factor code 8893
 Factor map 5462, 8893
 Factor model 3475, 3486
 Factor subshift 9257
 Factorization 8299, 8301
 Factors 544, 2972
 Failure stress 5025
 Failures 5196
 Fair division 3327, 4097
 paradoxes 3331
 Fall velocity 9801
 False alarm 2417, 9869
 Falsification 9003
 Fama–French model 3392
 Fama–MacBeth 3393
 Familiarity 2244
 Familiarization 2249
 Family 711
 of algebras 8292, 8294
 of circular orbits 6438
 of circular periodic orbits 6437
 of elliptic periodic orbits 6437, 6441, 6445
 of partial algebras 8292, 8296
 of periodic orbits 6446
 of resonant elliptic periodic orbits 6438

- Family income 2815
 Family income distribution 2816
 Family resemblance 7954
 Fano effect 7663, 7671, 9652
 Fano interference 7290
 Fano quadrupole 7292, 7297
 Fano resonance 1305, 7290, 7668, 7674, 7675, 7677
 Fano zero and resonance pole 7304
 Far from equilibrium 8368, 8371
 Far-from-equilibrium 1044
 Faraday patterns 3618
 Faraday waves 2340
 Farsighted consistency 6027, 6038
 Farsightedly consistent networks 6043
 Fast Fourier transforms (FFT) 10033
 Fast gate, quantum computing 7236
 Fast multipole method 8694
 Fast Radon transform 1723
 Fast system 6700
 Fast wavelet transform 591, 2382, 10035
 Faster is slower effect 6487
 Fat tails 6808
 Fathead minnow 2145
 Fault 6504
 - intermittent 5871
 - transient 5871
 Fault creep 4270
 Fault detection and prognostics 3251
 Fault detectors 3244
 Fault dip 9586
 Fault impedance 5026
 Fault model 7853
 Fault parameters 9594, 9633
 Fault slip 2483
 Fault tolerance 8067
 Fault-tolerant 5871
 Fault-tolerant firing squad synchronization problem 3552
 Fault-tolerant quantum computing, (FTQC) 7336
 FBA 5536, 5542, 5544, 5546
 FCBF 5352, 5353
 FCCF *see* Fuzzy conjunctive canonical forms
 FCM *see* Fuzzy C-means (FCM) clustering algorithm
 FCM algorithm, special fuzzy functions 4084
 FDCF *see* Fuzzy disjunctive canonical forms
 Feasible payoffs 7618
 Feature processing 2243
 Feature 7787
 - extraction 1990, 5349
 - interaction 5356
 - map 1823
 - quality evaluation 5351
 - ranking 5351
 - selection 1990, 2122, 5349
 - selection bias 5352
 Feature points 46
 Fecundity 3208
 Feed-forward 7846
 Feed-forward loop (FFL) 5662, 5697
 - motifs 5698, 5699
 Feedback 8, 280, 1043, 1055, 1493, 1949, 6008, 6273, 6279, 6281, 7592, 9014, 9043, 9104
 - discontinuous 6272, 6282
 - distributed 1494
 - globally distributed 1494
 - locally distributed 1494
 - memory type 1496
 - negative 7843
 - nonlinear 1496
 - optimal 6283
 - positive 7843
 - sample-and-hold 6282
 - stabilizing 6281
 - synthesis 6279
 Feedback arc set problem 9957
 Feedback control 3944
 Feedback control systems 7835
 Feedback controllers 2015
 Feedback equivalent 8619
 Feedback group 8620
 Feedback law 3524, 8617
 Feedback linearization 6080
 Feedback loops 1975, 2284, 4638, 7055, 8184, 8991
 - ecological systems 2702
 Feedback neural network 1822, 4873
 Feedback oscillators 562
 Feedback stabilization 9104
 Feedback stabilizer 8618
 Feedback trading 5414
 Feedforward network 1813
 Feedforward neural networks 1816

- Feedforward systems 563
 Feller 6231
 Feret diameter, fracture networks 6514
 Fermi 6664
 Fermi acceleration 25
 Fermi distribution 7669
 Fermi energy 8579
 Fermi hole 8576, 8578
 Fermi liquid 9696
 Fermi-liquid parameter 8583
 Fermi-Pasta-Ulam paradox 400
 Fermi-Pasta-Ulam recurrence phenomenon 9983
 Fermi surface 9679
 Fermi systems 6669
 Fermi, Enrico 2864
 Fermion 9679
 Ferny Creek 3135
 Ferroelectric 2021
 Ferromagnetic state 8712
 Feshbach resonance 9680
 Feshbach theory 7664
 Fetal development 1900
 Fetal stage 1900
 Feynman 3860, 7251
 Feynman diagrams 3365
 Feynman graphs 6664, 6669
 Feynman–Hellmann theorem 6729
 Feynman–Kac path integration 7127
 Feynman path integral, polymer physics 6814
 FF-SVM *see* Special fuzzy functions with SVM (FF-SVM) method
 FFL *see* Feed-forward loop
 FFT 1720, 8696
 FHP model 881
 Fiber bundle 6190
 Fiberglass laminate 7847
 Fibonacci numbers, biological fractals 3780
 Fick's law 991, 1399
 Fictitious play 5178
 Fidelity 7164, 7170
 Field 779, 3334, 3335, 3877, 5712, 5713
 definition 6288
 gauge 3876, 3877
 in amorphous computing 264
 phenomenological 3335
 structural 3335
 Field analogy method 272, 3336
 Field computation 273, 277, 284, 286
 Field computer 273, 3349, 3356
 Field programmable gate arrays 930
 Field scale 6568
 Field-theoretic methods 3360
 Field theory 3361, 3364, 3365, 3367, 3369, 3370, 3372, 8593
 Figure-ground contrast 2245
 Filament equation 3648
 Filling scheme 2937
 Filopodia 1742, 1743, 1746, 1750–1754, 1763
 Filter bank 6362, 10007
 Filters 1776, 6856, 10007, 10034
 band-pass 6860
 conjugate quadrature filter bank 6861
 high-pass 6860
 low-pass 6860
 quadrature mirror filter bank 6861
 subband coding 6860
 Filtration 3848
 Final prediction error (FPE) 3513
 Final set 4497, 4499
 Finance 3388
 Financial accounting 7847
 Financial customers 5408
 Financial drawdowns 7019
 Financial economics 3436
 Financial market data, stochastic processes 3590
 Financial markets 2284, 6808
 seismic activity 3716
 Financial records 3700
 Financial service industry models 685
 Fine grained observation 993
 Fine structure 6734
 Fine structure of turbulence 3650
 FinFET 7408
 Finger movement experiment 8004
 Finitary isomorphism 4990
 Finite alphabet, Markov chain 6950
 Finite automaton 4098, 4739, 7710, 9250
 reversible finite automaton 7710
 Finite configuration 7680
 Finite-difference 7895, 8601
 Finite-difference method 2430, 5169, 9923
 Finite-dimensional method
 Navier–Stokes equations 5932, 5939

- Finite dynamical system 160, 165
 Finite element 5800, 5807, 10053–10055
 Finite-element method 7896
 Finite field 167
 Finite lattice, ergodic theory 6942
 Finite normal mixtures 3423
 Finite portion transport 3814
 Finite rank, ergodic theory 3061
 Finite size correction 7007
 Finite-size scaling 1410, 1411, 3744, 6571, 6998
 fracture networks 6510
 Finite-source inversions 4446
 Finite state automaton 5634
 Finite state code 8903
 Finite state machine (FSM) 116, 1342, 3682–3684
 Finite state transducer 5641
 Finite statistical description 958
 Finite system, ergodic theory 6941
 Finite-temperature conductance 7669, 7676
 Finite time estimates 5206, 5214, 5217
 Finite time propagators 3581
 Finite type, subshift 6947
 Finitely additive 5454
 Finitely equivalent 8900
 Finitely fixed transformation 4991
 Fiorenzi, F. 790
 Firing set, type-2 fuzzy logic 4016
 Firing squad synchronization 5439
 Firing squad synchronization algorithm 3539
 Firing squad synchronization problem 3538, 7694
 on two-dimensional arrays 3557
 Firms
 active 7837
 as agents in neoclassical economic theory 178
 passive 7837
 First arrival density becomes 5226
 First-difference 2773
 First Hund's rule 7312
 First international workshop on rotational
 seismology and engineering applications 2525
 First-order 611
 approach 6982
 nonlinear partial differential equations 6216
 phase transition 1639, 1640, 9297
 transition 2840
 First passage 3749
 leapovers 5228
 time 3936
 time density 5234
 First-past-the-post 9947
 First-return map 5460
 Fishburn's solution 9952
 Fisher equation 3288, 6455
 Fisher exponent, polymer physics 6819
 Fisher–Lee relation 8600
 Fisher–Tippet–Gumbel distribution 3773
 Fisher's droplet model 1597
 Fisher's theorem 6641
 Fitness 3236, 4142, 4491
 Fitness function 2855, 4134
 proportionate 4135
 Fitness landscape 6640
 FitzHugh–Nagumo system 6467, 6468, 6474
 Five invariant manifolds 939
 Fixed effects 2773
 Fixed effects GLS 2776
 Fixed effects models 5570
 conditional likelihood 5566
 incidental parameters 5566
 within model 5566
 Fixed-path cost sharing rules 1682
 Fixed point 172, 5306, 6426, 6435, 6443, 7829,
 8927, 8930, 9692
 Fixed-point attractor 281, 8424–8426
 Fixed point drifts 5728
 FJC *see* Freely jointed chain (FJC)
 FL *see* Fuzzy logic
 Flagella 1741, 1742, 1747, 1748, 1759–1761, 1768,
 1771
 Flagellum 1741, 1742, 1774
 Flat free energy landscape 4233
 Flatness 3524, 3535, 8535
 Kurtosis 8535
 Fleming–Viot model 6231
 Flemming, Walther 923
 Flexible polymer, physics 6811
 Flexion-extension symmetry 5724
 Flexural rigidity 699
 Flip bifurcation 5308
 Flip polarization 5768
 Floating car data 9512
 Floating ice 1707

- Flocking and formations 5794
 Floods 3825
 Floor field
 dynamic 3160
 static 3160
 Floor field cellular automaton 3159
 Floppy modes 2830, 2832, 2835, 2837
 Floquet analysis 2329
 Floquet exponent 4532
 Floquet form 4516
 Floquet multiplier 2262, 2326, 4523, 8638
 Floquet normal form 8637
 Floquet theory 2324, 6629, 6632, 8932
 Florida 3137
 Flory 7822
 Flory exponent 2023
 Flory–Huggins free-energy, polymeric fluid 6827
 Flory's mean field theory 6787, 8726
 Flow 2262, 3146, 3147, 4516, 6590, 7842, 8639,
 8991, 9043
 bidirectional pedestrian 3148
 bottleneck 3149, 3150
 horocycle 8567
 in bounded domains 5931
 induced 6598
 isomorphism theory 4991
 nil 8567
 non-linear 6824
 past a circular cylinder 5938
 past an obstacle 5956
 pedestrian stream 3146
 rank one 8564
 smooth, with singular spectra 8565
 special 8556
 special von Neumann 8569
 three-dimensional flow 5939
 translation 8569
 uni- and multidirectional 3148
 Flow-density correlations 9383
 Flow equation 6576, 9686
 Flow map 3263
 Flow resistance 8467
 Fluctuating force 8927
 Fluctuation analysis (FA) 3761, 3763, 3766
 detrended 3763
 Fourier-detrended 3766
 modified detrended 3766
 Fluctuation analysis (MFdfa), multifractal
 detrended 3769
 Fluctuation-dissipation relation 4222, 5233
 Fluctuation-dissipation theorem 2031, 3371
 Fluctuation exponent 3761
 Fluctuation induced nonlinear instability 8549
 Fluctuation records 7589
 Fluctuation theorems 1000, 1007, 3599
 dissipated work 3605
 Jarzynski equality 3605
 second law 3599
 steady state FT 3606
 transient FT 3606
 work fluctuations 3604
 Fluctuations 732, 1543, 1898, 3361–3363, 3368,
 3371, 3372, 5007, 5722, 6642, 7024, 7522, 8001,
 8711
 broad distributions 7024
 critical 3368
 importance 3574, 3575, 3583, 3586–3589,
 3591–3593, 4513
 polymer physics 6811
 1/f Fluctuations 1278
 Fluency 2243
 Fluid dynamics 8940, 8947
 Fluid-filled crack 9919
 Fluid flow 6566
 Fluid–fluid displacement process 4948
 Fluid inertia 5576
 Fluid mechanics, Navier–Stokes equations 5927
 Fluid motion 3642, 3831
 Fluid–solid coupled waves 9921
 Fluid–structure interaction 2340
 Fluids 6481, 9588
 analogies with 6481
 balance laws 5928
 body force 5928
 constitutive equation 5929
 incompressible 5929
 mechanics modeling 5928
 Newtonian 5927
 steady-state flow 5930
 stretching tensor 5929
 Fluorescence 8596
 imaging 2100
 Flux 1395, 4386, 4713, 4715, 9729

- Flux-balance analysis (FBA) 5536, 5540, 5543, 5663, 9116
- Flux control coefficients 559
- Flux equilibrium 8942
- Flux function 4713
- Flux lines 6410
- Flux tube 9278
- Flux vector 1398
- Fluxon 8465
- fMRI 8004, 8005
- Focal depth 2474
- Focal length 6398
- Fock space 3365, 3366, 8844
- Focus-focus type 2262
- Fokker–Planck equation 6, 1000, 2801, 2811, 2817, 2877, 3371, 3591, 3656, 3657, 4589, 5734, 8392, 8723, 8772, 8927, 8931, 8937, 8947
- diffusion 8773
 - jump moments 8772
 - stochastic cascade process 3593
 - stochastic processes 3581
- Fokker–Planck–Landau equation 7813
- Fold catastrophe 714
- Fold point 7612
- Foliations 4600
- Folk theorem for repeated games 4103
- Folk theorems 7619
- Folklore theorem 5460
- Folksonomy 8084
- Følner E 784
- Følner sequence 784, 2945
- amenable group 4994
- Font conventions 2982
- Food security 1071
- Food webs 1248, 2704, 2714, 3661, 3662
- dynamics 3662
 - energy flows 2731
 - models 3665
 - predator 2731
 - prey 2731
 - robustness 3674
 - structure 3662
- Football 6386
- Footprint of uncertainty (FOU) 4013
- For-simplicity defense 179
- Foraging and coverage 5795
- Foraging robots 1226
- Forbidden links 2716
- Force 4380, 5012
- scale 3867
- Force approach 700
- Force chain 5008, 5011, 5016, 5017, 6490
- Force-clamp 7033
- Force correlations 5009
- Force distributions 5006, 5009
- Force moment tensor 5000
- conserved 5000
 - stoke's theorem 5000
- Force spectroscopy 7032
- Forced Korteweg and de Vries equation 9981
- Forced mobility 5607
- Forced nonlinear Schrödinger equation 9982
- Forced vibration 2422
- Ford–Fulkerson algorithm 6415
- Ford–Kac–Mazur model 8751
- Fore-arc 7924
- Forecast 2443, 2745, 2746, 5411, 9862
- binary 2443
 - continuum 2443
 - long-term forecasts 9863
 - short-term forecasts 9863
- Forecast verification 2438
- Forecasting 2747, 2755
- traditional 7850
- Foreign exchange market 3805
- Foreign wide moving jam 9376
- Forest fire 8033
- biological fractals 3789
- Forest fire model 3791
- Forest thinking 4564
- Formal concept analysis 8344, 8356
- Formal language 800
- Formal model 7057
- Formal power series 1934, 6311
- Formal series 6663, 6671
- Formant 2315
- Formation of crowds, anticrowds and anti-persistence in the symmetric phase 5595
- Former Soviet Union 2820
- Formulation
- Lagrangian 6589
 - Poisson 6589
- Forrester, Jay W. 9044, 9058, 9061, 9067
- industrial dynamics 9045

- Forster's result 8589
 Fortuin–Kasteleyn 8726
 Fortuin–Kasteleyn representation 8709
 Forward markets 5408
 Forward pass 1819
 Forward problem 9631
 Forward search 5350
 Foster–Miller TALON 1478
 FOTO and ASDA models for traffic recognition 9509
 FOU *see* Footprint of uncertainty
 Foundations of granular computing 4365
 Four-dimensional NMR 4220
 Fourier characteristic
 finite-rank 6309
 hyperfinite-rank 6309
 Fourier coefficients 2995
 Fourier decompositions 10033
 Fourier filtering 3774
 Fourier integral operator 6757
 Fourier slice theorem 9176
 Fourier spectrum 6395, 6398, 6399
 Fourier transform 1720, 3739, 6391, 6394, 7257, 7411
 quantum computing 7382
 Fourier transformation 6390
 Fourier/wavelets 10032
 Fourier's law 1399, 4386
 Fox H -function 5224
 FPGA 5881, 8076
 FPU paradox 8469
 FQQSPR equation 7464
 Fractal 67, 1043, 1412, 2575, 3720, 3721, 3822, 3879, 3881, 3893, 3923, 7565, 7567, 7827, 8536, 8714
 biology 3779
 conduction on 1412
 definition 3780
 deterministic 3701, 3702
 distribution 3822
 fractal-like kinetics 479
 geometry 3720
 percolation threshold 482
 random 3701, 3706
 real biological 3788
 scaling 3729
 spatial correlation coefficient 481
 spectral dimension 479
 time-lag correlation coefficient 481
 time series 479, 3793
 2D percolation theory 482
 (Zipf–Mandelbrot) distribution 479
 Fractal cities 7954
 Fractal dimension 478, 999, 1007, 1649, 2253, 2575, 3722, 3756, 3781, 3822, 3851, 3880, 3926, 6419, 6500, 6541, 6569, 6784, 7568, 8709, 8713, 8723, 8724, 9844
 biology 3780
 box-counting dimension 1000, 1002
 correlation dimension 1000
 entropy scores 2575
 Hausdorff 1005
 Hausdorff dimension 1000
 information dimension 1000–1002
 invasion percolation 4956
 measurements 3788
 polymer physics 6819
 Fractal dynamics 2254
 Fractal features 3795
 Fractal geometry 2255, 3700
 dynamical systems 3016
 ergodic theory 3015
 Fractal growth processes 3720
 Fractal media 7579
 Fractal metabolic rates 3784
 Fractal networks 6055
 Fractal noise 3794
 Fractal reaction kinetics 7566
 Fractal scaling behavior 3576
 Fractal spatial structure 5023
 Fractal structure 2253
 Fractal tiling 3815
 Fractality 3860, 3929
 renormalization 6056
 reverse renormalization 6056
 self-similarity 6055
 Fractional Brownian motion 3442, 3711, 3900
 Fractional Brownian signals 3899
 Fractional Fokker–Planck equation 3581, 5223, 5232
 Fractional GARCH model 3442
 Fracto-emission 9801
 Fracton 3888
 Fracton dimension 3888, 3889

- Fracton regime 2256
 Fracturation, degree 6507
 Fracture 3731, 9885
 discrete families 6515
 Fracture mechanics 9589
 Fracture networks 6506, 6570
 density 6516
 geological 6505
 percolation 6507
 three-dimensional models 6507
 Fracture process, synchronization 2636
 Fractured porous media 6505
 Fractured system
 invasion percolation 4957
 Fractures in rock 6504
 Fragile glass-formers 4212
 Fragment descriptors
 QSAR modeling 7074, 7076
 Fragmentation 3823, 6502, 9793
 Fragmentation bomb 9797
 Fragmented landscapes, space 2736
 Frame
 elements 1725
 tight 1726
 Frame mapping 3563
 Frame of reference 6427
 Frame of relevance 289
 Frame problem 1119
 Frame-relay protocol 2402
 Framework of granular computing 4366
 Framingham heart study 9092
 Frank vector 2642
 Fréchet derivative 3340
 Fréchet type 3320
 Fredholm alternative 5310
 Fredholm operator 5312
 Fredkin 8032
 Fredkin construction 8834
 Free action, mechanical systems 5486
 Free air carbon dioxide enrichment (FACE) 1102
 Free energy 3636, 3638
 polymer physics 6813
 Free-energy density
 polymer physics 6818
 Free energy functional 5260, 6195, 6201
 Free energy landscape 4224
 Free energy rate density 3276, 3282
 Free flow 9356, 9357
 Free induction decay 8590
 Free path encoding 5472
 Free will 9412
 Free word algebra 8293, 8296
 Freely jointed chain (FJC) 6813, 6814
 Freeway bottleneck 9282, 9308
 Freeway capacities in free flow at the bottleneck 9298
 Freeway traffic control 3945
 Freezing by heating 6487
 Freezing-thawing technique 3550
 Freq 6398, 6401
 Frequency band of electromagnetic waves 2622
 Frequency band pass filter 564
 Frequency control 638
 Frequency dispersion 9978
 Frequency distribution of past outcomes 178
 Frequency domain 7, 1501, 8952, 9911
 Frequency-halving bifurcation 2262, 4532
 Frequency metrology 6169
 Frequency-moment distribution 5030
 Frequency response method 8955
 Frequency size event statistics 5022
 Frequency size statistics 5022
 Frequency spectrum 6667
 Frequency-splitting bifurcations 638
 Frequency tagging 1437
 Frequency transformation after barrier crossing 1360
 Frequency vector 1934, 5066
 Bryuno vector 1939
 Diophantine vector 1939
 Frequent set, definition 6290
 Frequentist probability 470
 Freud 1884
 Friction 2615, 5026, 5473, 7858, 9589
 coefficient, effective 10050, 10052
 law 5024
 parameter 3160
 Friedel sum rule 7358
 Friedman–Moulin rule 1683
 Friedmann–Keller equations 3649
 Friedmann–Lemaître equation 3272
 Friedmann–Robertson–Walker model 1634
 Friend-of-a-friend (FOAF) 8098
 Friendship network 6007

- Frobenius–König 6245
 Frobenius normal form 6246
 Frobenius–Victory theorem 6248
 Front 6465, 6466
 combustion 6467
 solidification 6466
 weakly curved 6466
 Frozen ground temperatures 1714
 Frustrated systems 6418
 Frustration 6407, 9697
 FSM 3691, *see* Fuzzy system modeling
 Full A-shift 8892
 Full adder 5646
 Full completeness 5293
 Full configuration-interaction (CI) approach 7318
 Full cost coverage 1969
 Full group normalizer, ergodic theory 3066
 Full groups, ergodic theory 3065
 Full information maximum likelihood with optimal filtering (FIMLOF) 8997
 Full r-shift 8892
 Full rank
 individual 7626
 pairwise 7626
 Full support monitoring 7659
 Fullerene 690, 691, 9141, 9148
 Fullerene molecules, endofullerene 9652
 Fuller's phenomenon 5444
 Fully-developed turbulence 6195, 6196
 Function 3256, 3265, 6600
 definition 6287
 extension 6291
 fractal 3862
 Hamiltonian 6588, 6596, 6597, 6603
 hyperregular 6603
 invariant 6597
 Lagrange 3866
 Lagrangian 6589, 6603
 networks 1182
 of a molecule in AC 328
 of non-stationarity 1618
 ordering/level 8251
 strict evaluation 6301
 Function-analytic method, Navier–Stokes equations 5933, 5939
 Function and terminal nodes 3238
 Function-extension 6294
 Function generators 278
 Function germs 703
 Function set 4141
 Functional 5582
 multivalued 6603
 penalized 6607
 Tonelli 6604, 6605
 Functional cluster 1427
 Functional coefficient 3475, 3488–3490
 Functional complexity 491, 500
 Functional coordination 1558
 Functional data model (FDM) 4305
 entity 4308
 entity-valued functions 4308
 object 4308
 Functional dependency 1796, 4417, 7736
 Functional derivative 6711
 Functional equations 227
 Functional genomics 9102
 Functional granulation 8338
 Functional information, biological system 501
 Functional integral 1273, 3365
 Functional magnetic resonance imaging 1436
 Functional modularity, GRN 1191
 Functional network, clustering 507
 Functional neuroimaging 8004
 Functional order 1539
 Functional renormalization groups 2020
 Functional synthesis of finite automata 4739
 Functional transformation of states 187
 Fund flow 3472
 Fundamental diagram 3147, 3148, 3150, 3947
 stochastic processes 3588
 Fundamental diagram for traffic flow 9305
 Fundamental empirical features of phase transitions 9408
 Fundamental matrix of solutions 6430, 8637
 Fundamental modes 2474, 2484
 Fundamental QQSPR equation 7426, 7450, 7451, 7453, 7459, 7460, 7462, 7470
 Fundamental solutions 5248
 Fundamental theorem of calculus 6299
 Fundamental value 97
 Fundamentalist 96
 Fundamentals 5418
 Fungi, biological fractals 3788
 Funnel 6492

- Furstenberg structure theorem 9243
 Furstenberg's class 3076
 Furstenberg's conjecture 3105
 Furstenberg's multiple recurrence theorem 5451
 Further normalization 6176
 Fusion 6081
 Fusion gates 9720
 Fusion rules 3655
 Fuzzification 2368, 4010, 4871
 Fuzzified 4883
 Fuzziness 4072
 Fuzzy 843, 3243
 Fuzzy algorithms 4070
 Fuzzy analysis 4051
 Fuzzy association rule 4149, 4154
 Fuzzy boundary 4877
 Fuzzy C-means (FCM) clustering algorithm 1778, 4081
 Fuzzy chip 4885
 Fuzzy composition 4011
 Fuzzy conditional statements 4069
 Fuzzy confidence interval 8684
 Fuzzy conjunctive canonical forms (FCCF) 4082
 Fuzzy constraint 4075
 Fuzzy control 4882, 6936
 Fuzzy data-mining algorithm 4146
 Fuzzy decision 4076
 Fuzzy descriptor 4871
 Fuzzy disjunctive canonical forms (FDCCF) 4082
 Fuzzy environment 4075
 Fuzzy estimate 8684
 Fuzzy estimator 8684
 Fuzzy event 4050, 4053, 4072
 independent 4072
 Fuzzy expected value 8687
 Fuzzy functions 4055, 4080
 special 4083
 Fuzzy-fuzzy set 4012
 Fuzzy goal 4075
 Fuzzy granulation-degranulation 1782
 Fuzzy granules 4361
 Fuzzy graph 3994
 Fuzzy graph constraint, fuzzy logic 3999
 Fuzzy-graph extension principle 4002
 Fuzzy if-then rules 4004
 Fuzzy implications 6088
 Fuzzy inference 4696
 Fuzzy inference reasoning
 logical approach 6088
 mamdani approach 6088
 Fuzzy inference systems 6088
 Fuzzy integrals 231
 Fuzzy interval 6936
 Fuzzy logic 1343, 3985, 3989, 4073, 4313, 4697, 4871, 4875, 6067, 6087
 equivalence 4074
 implication 4074
 intersection 4074
 negation 4074
 principal contributions 4003
 structure 3988
 type-2 4009
 union 4074
 Fuzzy mean 8687
 Fuzzy measure 231
 Fuzzy membership function 4414
 Fuzzy model 4708
 Fuzzy neighborhood system 4361
 Fuzzy neural network 4404
 Fuzzy number 4071, 8681
 addition 4072
 division 4072
 inverse 4072
 multiplication 4072
 opposite 4072
 subtraction 4072
 trapezoid 4072
 triangular 4072
 Fuzzy perceptions 8683
 Fuzzy predicate 4871
 Fuzzy-predicate approximate reasoning 4871
 Fuzzy probability 4052
 Fuzzy probability distribution functions 4055
 Fuzzy probability space 4053
 Fuzzy probability theory 4047
 Fuzzy processor 4885
 Fuzzy proposition 4878
 Fuzzy quantifier 4871
 Fuzzy random events 4052
 Fuzzy random quantities 4051
 Fuzzy random set 4000
 Fuzzy random variable 8683
 Fuzzy randomness 4049
 Fuzzy realization 4051

Fuzzy reasoning 6087
 Fuzzy relation 4068, 4879, 5744
 Fuzzy-rough E-R diagram 7734
 Fuzzy rough intersection 7735
 Fuzzy rough join 7736
 Fuzzy rough projection 7736
 Fuzzy rough relational database 7733
 Fuzzy rough relational difference 7735
 Fuzzy rough selection 7735
 Fuzzy rough set 7730
 Fuzzy rough union 7735
 Fuzzy rule 4879
 Fuzzy rule bases 4080
 type 1 4083
 Fuzzy sample mean 8687
 Fuzzy set system 4360
 Fuzzy-set-theoretic facet 3989
 Fuzzy set theory 4148, 4355, 7730
 basics 3989
 fuzzy membership 7730
 Fuzzy sets 1778, 3986, 4009, 4047, 4061, 4062,
 4403, 4875
 contained in 4064
 degree of containment 4064
 degrees of equality 4064
 distance between 4050
 empty 4063
 equal 4063
 equal to a degree 4063
 interval valued 4063
 intuitionistic 4063
 L-fuzzy set 4062
 normal 4064
 subnormal 4064
 subset of 4064
 theory 4062
 type 2 4062
 type-2 fuzzy logic 4011
 type n 4063
 Fuzzy singleton 4062
 Fuzzy subset 8681
 Fuzzy-support of the linguistic terms in large
 1-itemsets 4157
 Fuzzy system 4696, 6087
 Fuzzy system modeling (FSM) 4081

Fuzzy system models
 evolution 4080
 future 4088
 Fuzzy system structure 3243
 Fuzzy test for hypothesis 8685
 Fuzzy validity 4006
 Fuzzy vector 4047
 Fuzzy vector quantization 1782

G

G-Equivariant minimizers, *n*-body problem 5982
 g-Factor 6841
 of any branched polymer 6842
 of randomly branched chains 6844
 of Y-shaped chain 6843
 G-Invariance 6597
 G-Protein-coupled receptor 2148
 G-Space, Hamiltonian 5484
 g-Twisted action 6602
 Gabor 3351
 Gabor uncertainty principle 3352
 Gabor wavelets 3351
 Gain ratio 1831
 Gait control table 5627
 Gaits 1554
 Galactic clouds 3279
 Galactic dynamics 6189
 Galactic orbit 411, 412
 Galam model 8387
 Galam, Serge 6386, 8381, 8387
 Galaxies 3274
 Galerkin method 5932
 Galileos' principle of relativity 6426
 Galois correspondence 6796, 6803
 Galois lattice 8275, 8295, 8303
 Galton–Watson process 647
 Game 1520
 absorbing games 8702
 abstract 1520
 balanced 1664
 common interests 3187
 concave 1664
 convex 1521
 demand revelation 1671
 dynamic 2215
 evolutionary games 4138

- game of incomplete information 7653
 games in normal form 8699
 in extensive form 4862
 in normal form 4857
 matrix games 8699
 multi-player games 8703
 non-transferable utility games 1666
 NTU- 1520
 of life 66, 116, 775, 782, 869, 892, 894, 895, 927, 4502, 8869, 8880
 of life rules 893
 of perfect information 5647
 on the unit square 4858
 prisoner's dilemma 3178, 3179, 3198, 3199
 prisoner's dilemmas 3200
 repeated games 8699
 rock–Paper–Scissors games 3200
 simple 1522
 standard fixed tree 1667
 stochastic game 8698
 stopping games 8699
 strategic 1668
 sub-modular 1664
 TU- 1520
 with complete information 433
 with incomplete information 427, 428, 440
 zero-sum 3188, 8701
 Game horizon 2222, 2224
 Game semantics 5290
 Game theory 1509, 1510, 1660, 2215, 4095, 4098, 4610, 5677, 6492, 6978, 8127, 8381
 dictator game 4609, 4616
 dynamical 4624
 evolutionary 4616
 neoclassical economics 181
 tit-for-tat 4617
 Gamma-band activity 8003
 Gamma-band synchrony 1439
 Gamma distribution 2801, 2807, 2810
 Gamma oscillations 6112
 Gamma ray 22, 35
 Gamma systems 928
 Gap 407
 Gap exponent 7002, 7003
 Gap propagation 6489
 Gap scaling 7002
 Gapology, quantum information processing 7387
 GapP function 7184
 Garbage-less circuit 7699, 7703
 Garbage-less computation 7697, 7706
 GARCH models 3427
 Garden of Eden (GOE) 2983, 2984, 3012, 5439, 7680
 configuration 779, 783
 pattern 783
 theorem 780
 Garman's model 5396
 Gas 9880
 Gas dynamics 4715
 Gas like regions, critical point 3792
 Gas volume fraction 9789
 Gaseous model 8693
 Gastrulae 532
 Gastrulation 529, 532, 533, 536–538
 Gate 7697
 COPY 1380
 FANOUT 1380
 Fredkin gate 7689, 7698
 NAND 1382
 NOT 1381
 ONE 1381
 quantum computing 7231
 reversible logic gate 7698
 reversible logic gates 7689
 switch gate 7689
 Toffoli gate 7698
 Gâteaux derivatives 3340
 Gated transport spectroscopy 7350
 Gauge theory of mechanics 5495
 Gauge transformation 9275
 Gauss 2867
 Gauss linking number 9270
 Gauss map 5461
 Gaussian ACF 7921, 7925
 Gaussian chain 6841
 single chain dynamics 6819
 with any type of branching 6848
 Gaussian curve 6529
 Gaussian distribution 5024, 8722
 Gaussian ensembles 7507
 Gaussian filter 10037
 Gaussian kernel 10037, 10038
 Gaussian minimum output entropy conjecture 7393

Gaussian noise 3583
 Gaussian probability density function 5219
 Gaussian random variable 6233
 Gaussian random walk, polymer physics 6812
 Gaussian systems 2963
 Gaussian thermostats 989, 1000, 1002, 1007
 Gaussian thermostatted systems 1001
 GCL *see* Generalized constraint language
 GDP 5326–5330, 5332, 5334, 5336, 5337, 5341, 5343, 5344
 GNP 5333, 5334, 5339, 5342
 GDToolkit 1256
 GEDI map, gene expression network 1183
 Gel 1609, 1739
 active 1739
 Gel electrophoresis 2093
 Gel fraction 6549, 6550
 Gel point 6545, 6547, 6554
 Gelation 3848, 7822
 polymer physics 6818
 Gelfand triplet 989, 1004
 Gemetic tree 3238
 Gender-role concepts 1905
 Gene 418, 525–528, 538, 539, 541–543, 4161
 active 527
 alternative splice 4170
 alternative splicing 4161, 4169, 4171
 biological behavior 1183
 constitutively active 527
 developmentally regulated 527
 engrailed 540
 exons and introns 4169, 4170
 expression 525, 527, 541
 functionally isolated “islands” 1191
 gap 540, 542
 her 535
 housekeeping 526
 maternal 540
 miniclusters 1183
 pair-rule 539, 540, 542
 past-transcriptional regulation 4172
 post-transcriptional regulation 4171
 regulated 527
 regulating activity 1186
 RNA genes 4172
 segment polarity 540
 splicing 4169

stencil genes 4172
 transcription 4169, 4173
 Gene × enviroment interactions 1916
 Gene × environment × development interactions 1922–1924
 Gene × environment interaction 1918, 1920
 Gene × environment interactions 1917, 1919
 Gene × environment interactions 1923
 Gene circuit
 architecture 1189
 dynamics 1189, 1190
 small 1188
 Gene conversion 4161
 Gene deserts and forests 4173
 Gene detection 3906
 Gene duplication
 and deletions 5659
 balancing selection 4167
 correlation complexity organism 4168
 DDC model 4168
 neofunctionalization 4167, 4168
 paleopolyplody 4166
 polyploidy 4163, 4167
 processed genes 4166
 retroposition 4166
 segmental duplication 4166
 segmental duplications 4167
 subfunctionalization 4167, 4168
 Gene-environment relationships 1883
 Gene expression 721
 high-dimensional attractor 1204
 network state 1183
 Gene expression microarray 9115
 Gene expression pattern 1182
 Gene expression profile 1182, 1188, 1204
 Gene knockout 9097
 Gene ontology 9097
 Gene order 4173
 Gene organization 3913, 3915
 Gene regulation, cell fate determination 1180
 Gene regulatory networks *see* GRN
 Gene-specific information 1187
 Gene therapy 423
 Genealogy 8258
 General circulation models 2
 General electric 7835

- General equilibrium 203
 necessary condition for 180
- General metabolic equation 2709
- General Motors traffic flow model 9334
- General operations among a family of sets, definition 6287
- General pattern 9356, 9364
- General practitioner services (GPs) 4566
- General-purpose analog computer 277, 285, 3357
- General-purpose computer 285, 3354
- General purpose frameworks 194
- General regression neural network (GRNN) 2154
- General scheme for generalized blockmodeling 6916
- General systems theory 207
- General traffic congested pattern 9323, 9507
- Generalization 1816
 fuzzy logic 4003
- Generalization operator 4397
- Generalization relation 4397
- Generalize 2851
- Generalized autoregressive conditional heteroskedasticity 3440
- Generalized blockmodeling 6915
 criterion function 6917
 criterion function requirements 6917
 deductive use of blockmodeling 6918
 direct approach 6916
 generalized equivalence 6915
 inductive use of blockmodeling 6918
 measures of fit 6917
 optimization 6917
 pre-specification 6918
- Generalized central limit theorem 3812
- Generalized constraint language (GCL) 4000
 fuzzy logic 3997
- Generalized decision class 7792
- Generalized decision function 7792
- Generalized delta rule 1819
- Generalized dimension 8538, 8539
- Generalized eigenvectors 6247
- Generalized equivalence, departures from permitted blocks 6917
- Generalized estimating equations 2776
- Generalized extreme value distribution 3320
- Generalized firing squad synchronization algorithms 3565
- Generalized firing squad synchronization problem 3547
- Generalized gradients 6271, 6274
- Generalized hip–Hops, n -body problem 5967
- Generalized hyperbolic distribution 3417
- Generalized impulse response function 5342
- Generalized Langevin equation 3577, 8929
- Generalized notions of solutions 6216
- Generalized orbits 5976
- Generalized OWA 230
- Generalized Pauli matrix 7372
- Generalized polynomial 3087
- Generalized regularized long wave equation 6455
- Generalized Riemann hypothesis 7096, 7104
- Generalized rigidity 1275
- Generalized solitons and compacton-like solutions 8460
- Generalized solution, n -body 5978
- Generalized Sundman–Sperling estimates, n -body problem 5980
- Generalized Wiener index for a regular dendrimer graph 6846
- Generalized Zakharov–Kuznetsov equation 6457
- Generalizing equivalence, permitted block type 6916
- Generated 703
- Generating function 2262, 3364, 5066, 6499
- Generating symbol 7429
- Generative grammar 1878
- Generative models of networks 10062
 Barabasi–Albert model 10063
 copying model 10063
 cosine similarity 10064
 forest fire model 10064
 preferential attachment 10068
- Generative social science 126
- Generator matrix 7327
- Generators 3877
- GENERIC 5260
- Generic 2268, 2923, 4515
- Generic chaos 955
- Generic dynamics 971
- Generic graph 6013
- Generic networks 2831
- Generic point *see* Regular point
- Generic rigidity 2835, 2838
- Generic scale invariance 3372

- Generic space 2238
 Generic structures 8996
 Genericity 6324
 Genetic algorithm (GA) 121, 1431, 2116, 3233, 3235, 3236, 3384, 4150, 4873, 5549, 5754, 8832, 9042
 Genetic assimilation 1925
 Genetic circuits 284
 bistable 1193
 Genetic determinism 1195
 Genetic engineering 418
 Genetic-fuzzy data-mining technique 4146
 Genetic-fuzzy mining problem 4151
 way of processing items 4151
 Genetic information exchange
 ecological system 2699
 Genetic interaction 9107
 Genetic network 9106
 Genetic neural networks 4404
 Genetic neural support vector machines 4407
 Genetic operators 2855
 Genetic perturbation 9106
 Genetic programming 121, 3233, 3237, 3385, 4745
 strongly typed 4140
 Genetic regulation 419, 2090
 Genetic regulatory network 284
 combinatorial regulation 722
 regulatory loops 722
 thermodynamic models 722
 Genetic tree 3233
 Genetics 1227, 3243, 3971, 9106
 complex genetics 9107
 differential expression 1233
 functional genomics 1233
 gene regulatory networks 1227
 genome wide association studies 1241
 interactions 3973
 mass spectrometry 1239
 microarrays 1233
 nuclear magnetic resonance (NMR) spectroscopy 1239
 quantitative 3974
 regulation 1227
 single nucleotide polymorphisms 1228
 single nucleotide polymorphisms (SNPs) 1241
 systems genetics 9107
 transcribed 1227
 transcriptome 1233
 translation 1227
 Genome annotation 5538, 5539, 5547
 Genome dynamics 4165
 Genome engineering 4173
 Genome sequencing 4173
 Genome size
 gene duplication 4166
 haploid 493
 microbial genome 4164
 microbial genomes 4163
 paleopolyploidy 4166
 polyploidy 4167
 selfish DNA hypothesis 4164
 Genome structure
 chromosomal territories 4163
 diploidy 4163
 eukaryotic 4162
 isochore 4164
 organization 4174
 paleopolyploidy 4166
 polyploidy 4163
 prokaryotic 4162
 Genomes 4161, 5536, 5538
 duplication and diversification 5699
 Genomics 2708
 comparative 3966
 computational 3966
 functional 3965
 Genotoxicity 2186
 Genotype 118, 2855
 Genotyping 3974
 Geo-complexity 1216
 Geodesic distances 6005
 Geodesic flow 3098, 8645
 Geodesic motion 993
 Geodesics 3040, 3045, 3046
 fractal 3871
 Geodesy 8856
 submarine 8857
 Geodetic observations of ground deformation 1691
 Geologic analogy method 8998
 Geological formations
 transport processes 6505
 Geological fractures 6505
 Geometric 4195, 4197

Geometric complexity 3016
 Geometric condition, multiplier 1494
 Geometric coordinate-free approach to stochastic modeling 8756
 Geometric frustration 4229
 Geometric gate, quantum computing 7234
 Geometric integration 2003
 Geometric irregularities 5919
 Geometric mean 228
 Geometric mechanics 5483
 Geometric OWA 230
 Geometric phase 4194–4199, 4201, 4202, 4204, 4208, 4209
 Geometric singular perturbation theory 6697
 Geometric structures, reduction of 5497
 Geometrical and material heterogeneity 5024
 Geometrical condition
 piecewise multiplier 1495
 Geometrical phase transition 8714
 Geometrical simulation 6013, 6020–6022
 Geometrodynamics 8843
 Geometry
 curved 3867
 dynamical systems 3016
 noncommutative 3869
 space-time 3869
 Geometry information in amorphous computing 265, 267
 Geometry of group action 6187
 Geophysical fluid dynamics 8118
 Geostationary meteorological satellites 9613
 Geothermal field 2605
 Gerken 3539, 3541, 3542
 German Indonesian tsunami early warning system 9596
 Germinal stage 1900
 Gestalt perception 8003
 Gestalt psychology 4895, 7991, 8003, 8267
 Gestalt theory 8939
 Gestaltkreis 7991
 Gevrey 6324, 6325
 Gevrey-2 5989
 Gevrey index 6656
 Gevrey spaces 6649
 Geyser 6958, 6969
 Ghettos 6783

GHZ *see* Greenberger–Horne–Zeilinger (GHZ) state
 GHZ experiment 7377
 Giant component 6497
 Giant SCC (GSCC) 5270
 Gibbard–Satterthwaite theorem 9934, 9938
 Gibbs distribution 4383
 discrete 6946
 ergodic theory 6946
 Gibbs entropy 1002, 1006
 Gibbs–Markov 965
 Gibbs measure 3055
 Gibbs’ oscillations 10032, 10040
 Gibbs’ phenomena 10032, 10033
 Gibbs property, ergodic theory 6942
 Gibbs sampler 2749, 2751, 2753
 Gibbs-sampling 450
 Gibbs state
 ergodic theory 6940, 6948, 6949
 property 6949
 summable potential 6947
 Gibbs–Thomson effect 6467
 Gibbs, Josiah Willard 2860, 2863, 2864
 Gibbsian systems 3087
 Gibrat’s law 180
 Gillespie algorithm 330
 Gini coefficient 2801, 2815, 2816
 Gini index 1831
 Ginzburg–Landau functional 8712
 Ginzburg–Landau (RGL) equation 3624, 3626, 6168, 6463, 8931, 8934
 Gipps-equation for safe speed in vehicular traffic 9336
 Girth 6241
 GL rule 895, 4241, 4245
 Glaciers 1711
 glacier models 1711
 Glass 1262, 2036, 9885
 Glass transition 9790
 Glassy dynamics 7584
 Glassy effects 2023
 Glauber–Sudarshan representation 8933
 Glider 775, 4240, 4241, 5439, 8031
 Glider gun 4243
 Gliese 876 6447
 Glimm–Effros theorem 3059
 Glioma cell migration, cellular mechanisms 917

- Glioma growth, brain's fiber tract 918
 Glioma invasion, effects of fiber tracts 918
 Global asymptotic stability, controllable 8618
 Global attractor, Navier–Stokes equations 5953
 Global catalog 9832
 Global change 2712
 Global climate change 2227
 issue 2225
 result 2227
 Global climate models 7592
 Global connectivity 6511
 Global dynamics 174
 Global function 7680
 Global GrC model, second GrC model 4345
 Global mean temperature, change rates 1097
 Global minimum 1818
 Global Pareto optimum (GPO) 2227
 Global positioning system (GPS) 1219, 1691,
 3688, 4251
 and earthquake response 4276
 and fault slip rates 4268
 and gravity data 4266
 and InSAR data 4264
 and seismic data 4264, 4275
 and transient deformation 4271
 and volcanic deformation 4262, 4266, 4275
 applications of GPS data 4255
 error sources 4252
 high sampling rate 4275
 inferring deformation source from 4261, 4263,
 4266
 modeling of data 4258
 postseismic deformation measurement using
 4273
 real-time data 4276
 relative precision 4255
 strength and weaknesses for deformation
 measurement 4267
 strengths and weaknesses for deformation
 measurement 4264, 4275
 strengths of 4255
 use with other datatypes 4264
 Global rigidity 3096
 Global-search 2449
 Global seismographic network 2508
 Global simplicity 968
 Global warming 3115
 photochemical smog 1098
 Global warning system 2367
 Global welfare 2227
 Global workspace theory 1438
 neuronal global workspace 1438
 Globular cluster 8696
 Globular form, polymer physics 6817
 Globus pallidum interior 629
 Gluckman, Max 8268
 Glycine/NMDA receptor 2146
 Glycogen phosphorylase B (GPB) 2129
 Glycogen synthase kinase-3 2145
 Glycoproteins 9751
 GO-GARCH 4127
 Go-like systems 7035
 Goal 7539
 achievement 7539
 active vs. inactive 7543
 chosen 7543
 end-goal 7539
 executed vs. waiting 7543
 individual vs. social 7543
 innate 7539
 learned 7539
 maintenance 7539
 organizational 7839
 prosocial vs. aggressive 7543
 realizable 7539
 shared vs. collective 7543
 side-goals 7539
 sub-goal 7539
 unrealizable 7539
 Goh condition 5449
 Gold nanoparticles 1321
 model 1321
 reactivity 1321
 STM image 1321
 Golden mean shift 8892
 Golden number 6632
 Goldreich–Julian” charge density 35
 Goldstone mode 6466
 Golubitsky 704
 Goodness of fit 8329
 Goodwin model 563
 Google bombing 5279
 Google PageRank 6239

- Gordon S. Brown 7835
 Gossip in amorphous computing 263, 264
 Goto 3539, 3542
 Goto–Nambu action 1642, 1647
 Gottesmann 7256
 Gottschalk W 780, 781, 785
 Goudie 3119, 3130
 Gouy–Chapman model 5578
 Governance 9427
 Government securities dealers 5395
 Governor’s Office of Regulatory Assistance (GORA) 7055
 GPAC 274
 GPCR 2148
 GPL *see* Growing Point Language (GPL)
 GPO *see* Global Pareto optimum
 GPS 3690, 8851, 8856, 9424, 9635
 GPs *see* General practitioner services, 9407
 GPS data collection 4253
 campaign GPS measurements 4253
 campaign measurements 4253
 continuously recording GPS 4253
 semi-permanent instrument deployment 4277
 Grade of membership 4062
 Gradient 3340, 3352, 3354, 6711
 as primitives in amorphous computing 264
 in amorphous computing 267
 Gradient ascent 3340
 Gradient descent 281, 1817, 1820
 Gradient expansion 4384
 Gradient networks 6056
 Gradient percolation 6530
 Gradual development 3243
 Graduation, fuzzy logic 3986
 Grain boundary 6195, 6200
 Grain of truth 5182
 Gramian matrix 7461
 Grammar 2318
 Grand-canonical minority game 5590, 5598, 5602, 5603
 Grand-canonical version 5589, 5590
 Grand coalition 1511
 Grand junction system 9954
 Granger causality 1434
 Granovetter 8272
 Granovetter, Mark 8268
 Granular agent 4426
 Granular computing (GrC) 1778, 4305, 4313, 4324–4326, 4328, 4340, 4355–4357, 4403, 8334
 applications of 4366
 data table 4306
 granules 4305
 Granular data 4402
 Granular data model (GDM) 4314, 4346
 Granular exact sequence 4350
 Granular flows 5003, 9414
 inertial 5003
 quasistatic 5003
 Granular fluid 4380
 Granular kernel machines 4411
 Granular link 4402
 Granular mathematics (GrM) 4313
 Granular matter 4378
 Granular media 4215, 6490
 Granular model 2688, 4393
 Granular neural network 4403
 Granular neuron 4402
 Granular reflection 4427
 Granular structure (GrS) 4324, 4329, 4337, 4341, 4348
 Granular support vector machines 4411
 Granular synthesizer 4426
 Granular systems 4411
 Granular weights 4403
 Granularity 4396, 4397, 5736, 5749
 contingency table 1865
 degree 1871
 Granulation 4357
 functions 3993
 fuzzy logic 3986, 3992, 3994
 Granulation of knowledge 1798
 Granule 1798, 4397, 4423
 Granules of knowledge 7760
 Graph 1141, 2201, 4487, 4488, 4494, 6030, 6240, 6411, 6415, 6417, 6419, 6421, 8232, 8246, 8281, 8322, 8351, 8604
 acyclic 8250
 bipartite graph 6241
 Cayley 778
 chemical 2201
 classical random 1245
 deterministic 4494
 directed/undirected 1244
 dual 6583

- fracture networks 6510
 labeled 785
 matching 6583
 maximum degree 8252
 motifs in 5692, 5693, 5695, 5697–5700, 6369
 non-planar 6419
 planar 6419
 recursive 4487, 4488
 self-dual 6583
 simple directed 8246
 simple undirected 8246
 small-worlds 1244
 underlying 6241
 Graph automorphisms 4822
 Graph centrality 4832
 Graph distance 4831
 Graph drawing 1255
 Graph grammar 8840
 Graph layout algorithm 8283
 Graph machine neural networks 2149
 Graph partitioning 1143, 1147, 8604
 Graph rewriting 336, 337
 Graph rewriting automata 8840
 Graph self-joinings (GSJ) 3074
 Graph structure 10058
 Graph theory 6050, 6836, 8266, 8270, 8604
 structure/traversal isomorphism 4608
 Graph visualization 1244
 Graphael 1256
 Graphcode 157
 Graphene 8577
 Graphene sheet 691, 692, 694, 700
 Graphite 690–692, 700
 Graphitic patch 9147
 GraphViz 1256
 Grashof number 5955
 Grassberger model 6778
 Grassberger's effective measure complexity 495
 Grassmannian 7512
 Gravitational model 1047
 Gravitational wave 1653
 Gravity
 loop quantum 3869
 quantum 3869
 GRDDL (gleaning resource descriptions from
 dialects of languages) 8084
 Great multiplier 5989
 Greater London 1044, 1059
 Greek fire 3116
 Green fluorescence protein 562
 Green function 9594
 Green–Kubo formalism 995, 1001, 4386
 Green matrix 6614
 Greenberg–Hasting model 886
 Greenberger–Horne–Zeilinger (GHZ) state
 fluorescence measurement 7244
 quantum computing 7242
 Greenhouse effect 3294, 3295
 Greenhouse gases 3294, 3295, 7592
 Green's function 5246, 6741, 9640, 9902
 Green's law 9606, 9637
 Green's theorem 7443
 Grey Walter 1118
 Grid 1720, 6398, 6401
 Cartesian 1720
 exotic 1735
 polar 1720
 pseudo-polar 1721
 rectopolar 1720
 Grid computing, agent-based modeling 157
 Grid environment 2365
 Grid generation 7892, 7900
 Grid search in space 9913
 Grid/cloud computing 4314
 Grid/cloud computing are granules 4344
 Grim strategy 4101
 Grim trigger strategy profile 7656
 GRIP 1256
 GRN
 attractor states 1182
 Boolean network 1198
 complex 1180, 1181
 dynamics 1188
 evolution 1187
 functional modularity 1191
 in living cells 1206
 medusa structure 1184
 modularity 1184
 state 1188
 studies 1185
 transcriptome 1181
 Gröbner basis 6327
 Gromov, M. 780, 781, 783, 785, 786
 Gronwall's lemma 3264

- Gross Pitaevskii 6721
 Grossberg 278
 Grossman–Aharony hull 6527
 Ground motion 1217
 Ground-motion complexity 4436, 4456
 directivity effect 4450
 rotational motions 4467
 seismic coda 4437
 Ground motion intensity measures 2417, 4435, 4462, 4464
 ground-motion scaling relations 4440
 peak ground 4435
 peak ground acceleration 4435
 peak ground acceleration close 4466
 PGA-value 4466
 precariously balanced rocks 4466
 response spectra 4435
 rotational motions 4467
 S_A -values 4466
 scalar intensity measures 4435
 strong-ground motions 4436
 strong-motion seismology 4437
 Ground motion uncertainty 4435
 directivity effect 4450
 epistemic uncertainty 4465
 ground-shaking variability 4468
 inter-event variability 4465
 intra-event 4465
 M 6.0 Parkfield earthquake 4437
 M 7.6 Taiwan (Chi-Chi) earthquake 4437
 maximum shaking levels 4466
 microzonation studies 4460
 physical limits to maximum ground motions 4466
 quantifying uncertainty 4465
 random (aleatory) variability 4435
 scientific (epistemic) uncertainty 4435
 velocity-pulses 4450
 Ground state 6407
 Group 778, 4589, 6735, 8291, 8293, 8295, 8296
 Abelian 778
 action 6597
 amenable 778, 783
 black-box 7090, 7094, 7095
 Cayley graph of a finitely generated 778, 783, 785
 character 6597
 class 7096
 classes 4590
 coset and quotient group 4590
 dihedral 7101
 direct product 4590
 finite state automata 4591
 finitely generated 778
 Følner sequence in a 784
 free 778, 784
 free Burnside 784
 Galilean 3863
 Heisenberg 8560
 homology 6602
 homomorphism, isomorphism, and automorphism 4590
 homotopy 6601, 6607
 invariance 6736
 L-surjunctive 788, 789
 Lie 6597, 6598
 Lie group and Lie algebra 4590
 Lorentz 3868
 mean on a 783
 non-Abelian 7101
 non-amenable 784
 normal subgroup 4590
 of sub-exponential growth 780
 quotient manifold 4591
 quotient set 4591
 representation of 6735
 residual finite 785
 residually finite 778, 785
 ring 779, 788
 semidirect products 4590, 7103
 semigroup 4590
 semisymplectic 6597
 sofic 780, 785, 786
 solvable 7096
 subgroup 4590
 surjunctive 780, 785, 790
 symplectic 6597
 temporal character 6597
 torsion-free 788
 transformation group 4591
 Group action 2262, 6795
 Group cohesion 1555
 Group dynamics 8267
 Group interaction 7997

- Group model building 4476, 4478, 7057, 8988
 Group non-membership problem 7187
 Group oracle 7187
 Group selection 3213
 Group shift 8907
 Group test wavelet (GTW) 10036
 Group theory 8935
 Group velocity 8483, 9976
 Group velocity dispersion 6139
 Group workshops 1853, 1858
 Grover's algorithm 7258
 Grover's quantum search algorithm 7241, 7386
 Growing domain size 4235
 Growing point language (GPL) 260, 929
 sequencing decision 266
 Growth
 accelerated 4493
 exponential 7843
 Growth and competition principle 8943
 Growth dynamics 682
 negative feedback (constraints) 684
 positive feedback 684
 Growth process 884
 Growth rate 1053, 1054, 1056
 Growth stocks 3391
 GSJ *see* Graph selfjoining
 GTS 9613
 Guaranteed possibility 6929
 Guckenheimer 704
 Guiding function 6618
 Gum rosin 9815
 Gumbel type 3320
 Gutenberg and Richter 5022
 Gutenberg–Richter (GR) law 661, 1219, 2360,
 2413, 2559, 7018
 tapered Pareto distribution 2559
 Gyroresonance 25
 Gyroscopic systems 6634, 6636
 Gyroscopic term
 bundle reduction 5499
- H**
- h index 225
 \hbar -Pseudodifferential calculus 6757
 elliptic symbol 6758
 H^1 6600
 H_2 696–699
 Haar–Fisz transform 8674
 Haar measure 3040
 Haar transform 10009–10011, 10014, 10016
 Haar wavelet 6365, 10034
 Habitat 2737
 Habitat fragmentation 2723
 Hadamard 6664
 product 7428
 HaikuBot 4143
 Haken–Kelso–Bunz (HKB) equation
 coexisting tendencies 1550
 complementary 1549
 tendency 1550
 Haken–Kelso–Bunz (HKB) model 5718, 5720
 Hales–Jewett coloring theorem 3092
 Half-adder 5646
 Half relaxed limits 6224
 Hall set 1037
 Halpern 8832, 8836
 Halpern and Caltagirone 8837
 Halting 5524
 Halting problem 287, 5468
 HAM 5144, 5146, 5149, 5150, 5154, 5156
 Hamachi's example, nonsingular Bernoulli
 transformations 3061
 Hamaker constants 3633
 Hamilton equations 5066, 5452
 Hamilton filter 451
 Hamilton–Jacobi–Bellman equation 6219, 6221
 Hamilton–Jacobi–Bellman–Isaacs equation 6221
 Hamilton–Jacobi equations 1504, 4540, 4542,
 5076, 6237, 6272, 6278
 C^1 subsolutions 4559
 critical equation 4549
 critical subsolution 4550, 4551
 critical subsolutions 4557
 intrinsic metric 4551, 4552
 semiconcave functions 4559
 solutions 4545
 strongly semiconcave 4547
 strongly semiconvex 4547
 subsolution 4549
 subsolutions 4543, 4548
 time-dependent 4556
 viscosity solution 4558

- viscosity solutions 4546
 viscosity test functions 4551
 Hamilton operator 8933
 Hamilton–Poincaré equations 5496
 Hamiltonian 1503, 2263, 4542, 5064, 5065, 5445, 5754, 6278, 6319, 6323–6325, 6408, 6633, 7139, 7405
 conjugate 4544
 dynamics 5064
 effective 7138
 flow 5065
 left-invariant 5447
 lift 5445
 two-qubit interaction 7235
 vector field 5445
 Hamiltonian chaos 6634
 Hamiltonian dynamical systems 6176
 Hamiltonian function 6631
 Hamiltonian G -space 5484
 Hamiltonian Hopf bifurcation 2262, 4523
 Hamiltonian path problem 2093, 9705
 Hamiltonian system 383, 2262, 2330, 2963, 4515, 5064, 5452, 6190, 6433, 6633, 6637
 billiard systems 2963
 KAM-systems and stably non-ergodic behavior 2964
 singular 5961
 Hamiltonian vector field 6176, 6713
 Hammersley–Clifford theorem 8323
 Hammett equation 2200
 Hamming distance 7327
 Hand 8200
 Hand calculation method 3157, 3164, 3165
 complex 3165
 dynamic flow 3164
 fixed flow 3164
 simple 3165
 Hand clapping 8200, 8203
 Handedness 1557
 Handicap 8127
 Handwriting recognition 4890
 Hansch 7437
 Hansch-like relationship 7454, 7470
 Hansch QSAR models 7427
 Hansch’s lipophilicity 2200
 Haploid genome size 493
 HAR 8789
 Harary index 6838
 Hard ball systems 1006
 Hard margin linear SVM classification 2171
 Hard margin nonlinear SVM classification 2178
 Hard spheres 4215
 Hard thresholding 10033, 10036, 10037
 Hardness proof 5468
 Harmonic 3737
 Harmonic analyzer 5474
 Harmonic function 3739, 3750
 Harmonic instability 2327
 Harmonic mean 228
 Harmonic measure 3720
 growth probability 3725
 Harmonic oscillator 5443, 8586, 8632
 damped harmonic oscillator 8634
 Harmonic synthesizer 5474
 Harmonic tremor signal, volcanic sound 4849, 4850
 Harrod growth model 8997
 Harsanyi model 428, 429
 Hartman–Grobman theorem 4726
 Hartree–Fock 1309, 8576
 Hartree–Fock approximation 8583
 Harvesting 3683, 3690
 Hasbrouck measure 5401
 Hash functions 7097
 Haskell model 2596
 Hasse-diagram 338
 Hausdorff dimension 3880
 conformal repeller 6952
 ergodic theory 3017
 Hautus 3527
 Hawaiian fire-fountaining 9785
 Hawk–Dove game 3178, 3179
 Hawthorne studies 8267
 Hazard 3110, 3112, 9831
 earthquake 3130
 fire zone 3126
 flood 3117
 future flood 3128
 map 2438, 3138
 tsunami 3119
 type 3112
 Hazards warning 1223
³He-rich events 30
 Head 6241

- Healing length 9694
 Health
 consequences of climate change 1096
 social care management, system dynamics studies 4571
 social care, overview 4566
 World Health Organization (WHO) definition 1096
 Health care 4577, 7061
 costs 4578
 delivery 4582
 market models 685
 providers 4582
 system dynamics applications 4561
 United Kingdom and Europe 4561, 8989
 United States 8989
 Health insurance 4584
 Health management, system dynamics workforce planning models 4574
 Health protection 4585
 Health treatment, system dynamics 4563
 Heat bath 8929
 Heat dissipation 5867
 Heat equation 1487
 boundary control 4806
 controllability 4806, 4809
 one-dimensional 4813
 Heavy bottlenecks 9392
 Heavy elements 3279
 Hebbian assemblies 1439
 Hebbian learning 4873, 5882
 Hector mine earthquake 2601
 Hedlund G 782
 Hegselmann-Krause model 8397
 Height defuzzifier 6091
 Heisenberg equation 8932
 Heisenberg picture 8927
 Heisenberg spin glass 4232
 Heisenberg time 7168
 Heisenberg's uncertainty principle 2091, 4313, 4343, 7446
 Hele-Shaw problem 3892
 Helfand moment 991, 1000
 Heliosphere 21
 Helmholtz-Smoluchowski (HS) slip 5578
 Hemagglutinin 9751
 Hemispherectomy 1903
 HEMT 7402
 Henderson, Lawrence 8267
 Hendrickson's bond testing 2837
 Hénon and Heiles system 386
 Hénon-like maps 964
 Hénon map 407, 3514
 Hepp 6666
 Hepp's theorem 6664
 Heraclitus 3268
 Herbert 3689
 Herding 3153, 3154
 behavior 6483
 Hereditary information 3291, 3298
 Hereman, W. 91
 Herfindahl-Hirschman index 8235
 hERG (human ether-á-go-go) 2166
 hERG (human ether-á-go-go-related gene) 2146
 Herman, Gazis et al. car-following model 9334
 Hermann, J.A. 5474
 Hessian matrix 703
 Heston stochastic volatility model 8792
 Heterochrony 1916–1918
 Heteroclinic connection 6465
 Heteroclinic orbit 2277, 4522
 Heterodimensional cycle 4732
 Heterogeneity 208, 3375, 4956, 4998, 5004, 5017, 5411, 5428, 6492, 8369
 measurement 4956
 spatial 5017
 temporal 5017
 Heterogeneous 610
 Heterogeneous CA 837
 Heterogeneous chemical reactions 7570
 Heterogeneous connectivity 1558
 Heterogeneous directed network 6030
 Heterogeneous fault zone 5022
 Heterogeneous good 3327
 Heterogeneous linking network 6029
 Heterogeneous market 4110
 Heterogeneous teams 2076
 Heterogeneously catalyzed reactions 7566, 7573
 Heterojunction 8576
 Heteroskedasticity 2773
 Heterostructure 1018, 5775, 8577
 Heuristic 2244
 Hexagon 8934
 Hexahedral grids 7900

- Hexatic phase 2026
 Hidden layers 1815
 Hidden Markov model 9839, 9846
 Hidden population 8225, 8230
 Hidden subgroup problem 7095
 Abelian 7095, 7096
 dihedral 7101, 7102, 7106
 Heisengroup group 7102
 nilpotent group 7103
 non-Abelian 7100, 7102, 7113
 normal subgroup 7101
 Hierarchical clustering 1148, 5054
 with relational constraints 8263
 Hierarchical modeling 457, 6055
 Hierarchical ordering, species 490
 Hierarchical task networks (HTN) 5192, 5201
 HTN domain description 5193
 HTN planning problem 5193
 methods 5193
 non-primitive 5193
 operators 5193
 primitive tasks 5193
 Hierarchy 4324, 4326, 4328, 4329, 5739, 6386, 8247
 complete 8247
 of beliefs 430
 of system specifications 346
 HIGFET 8576, 8584
 High density regions, critical point 3792
 High-pass filters 592, 595
 High performance computing 7908
 High-temperature approximation 8588
 High-throughput data 5538, 9094, 9097
 High-throughput docking 2170
 High-throughput screening (HTS) 2161
 Higher level instruction 4350
 Higher order concept approximation 4353
 Higher rank \mathbb{Z} Anosov actions 3098
 Highest posterior density interval 449
 Highway bottleneck 9282
 Hijacked links 5279
 Hilbert
 basis 2263
 semispace 7447
 space 3338, 3340, 3353, 4194, 4196, 4197, 5464, 7442
 transform 636, 2940
 uniqueness method 1492
 Hilbert–Banach spaces 7442
 Hilbert–Sobolev spaces 7444
 Hill
 clusters 1608
 equation 2325, 6626, 6629, 6631, 8637
 estimator 3410
 Hillis, Danny 5477
 Hillman 8844
 Hip–Hops, n -body problem 5967
 Hippocampus 6099, 6112, 6113
 Hirota method 8119, 8481
 bilinear 81
 Hisaoka 3564
 Histone code 1196
 Historical earthquakes
 characteristic earthquake 2562
 damage rheology 2563
 Historical records, incomplete 9833
 History 5026, 7617, 7622
 public 7625
 History-independent subgame perfect equilibrium 4107
 HITS 5272
 Hitting time set 9238
 HLA_GRID_Repast 157
 HMETIS 5055
 Hodgkin–Huxley 6102
 Hofbauer’s example 6950
 Hölder condition 8720
 Hölder exponent 3768, 3897
 Hölder mean 228
 Hölder norms 5087
 Holism 207
 Holland–Leinhardt model 8228
 Holographic 6394
 Holography 6395
 Holonomy invariance of measures of maximum entropy 959
 Holophrastic generator 1891
 Homans’ principle 8191
 Homans, George 8268
 Homeobox protein, entropic profile 500
 Homeodynamics 482
 Homeostasis 565, 6113
 Homicide, surge 3301

- Homo oeconomicus 8188
 Homo sapiens 8400
 Homo sociologicus 8188
 Homochirality 3286, 3289, 3291, 3294, 3298
 Homoclinic bifurcations 3019
 Homoclinic orbit 406, 2265, 4522
 Homoclinic tangency 4733
 Homoclinic tangle 384, 406
 Homogeneity 8323, 8326
 Homogeneous 3234
 Homogeneous cooling state 4381
 Homogeneous coordinate 56
 Homogeneous directed network 6029
 Homogeneous linking networks 6028
 Homogeneous market 4110
 Homogeneous problems 1682
 Homogenization 310, 1399, 6225
 Homography 46, 49
 Homological algebra 4341, 4349
 Homological equation 5989, 6312, 6315, 6714, 6762
 Homological operator 6179
 Homology 1882, 6602
 Homomorphism 8292, 8298–8301
 lattice 8292
 of measure algebras 5461
 Homophily 8234, 8316, 8330
 Homotopy 6601
 analysis method 5144, 5164, 5169
 perturbation method 5166
 Homunculus 4894
 Honda’s fuzzy logic transmission 3991
 Hong–Ou–Mandel (HOM) interference 7255
 Hooke, Robert 923
 Hooke’s law 699, 10050
 Hopf algebra 1037
 Hopf-algebra 1037
 Hopf bifurcation 4515, 5311, 6336, 7605
 Hopf decomposition 3057
 Hopf fibration 5492
 Hopfield 3352
 Hopfield network 164, 279, 1434, 4873
 Hopping rate 2259
 Horizon
 free 1502
 infinite 1502
 Horizontal gene transfer 5664
 Horizontal hostility 5610
 Horizontal lift 5503
 Horizontal projection 5503
 Horizontal space, definition 5502
 Horizontal transmission 3213
 Horizontal vector fields
 definition 5504
 Horocycle flow 3098, 4985
 Horseshoe 3829, 3839
 Horst and graben 9588
 Hoshen–Kopelman algorithm 6524, 7824
 Hospital bed utilization 4569
 Hostility
 horizontal 5610
 vertical 5610
 House Barter games 1526
 Household
 budget data 5553
 income 2285
 Households as agents in neoclassical economic theory 178
 HPM 5144, 5146, 5147, 5151, 5154, 5156
 HPP model 879
 HRI
 anthropomorphism 4647
 autonomy 4651
 benchmarks and ethical issues 4649
 cost/benefit analysis 4652
 critical benchmark 4651
 design 4646
 embodiment 4646
 ethical theory 4650
 human factors 4646
 imitation 4651
 multi-modal perception 4645
 privacy 4651
 research challenges 4645
 safety 4650
 scalability 4650
 success relative to human caregiver 4652
 systems 4646
 task-oriented benchmarks 4652
 testbed 4645
 HRI *see also* Human–robot interaction
 HRI influences, popular culture 4644
 HRI-specific sensors 4646
 HTML (hypertext markup language) 8086

- HTTP (hypertext transfer protocol) 8088
 Hub 725, 5272, 8271, 8277
 Hubbard model 7347, 9679
 Hubbard gap 7357
 Hubbard–Stratonovich transformation 7512
 Hubbert's lifecycle method 8998
 Hull 8709, 8713, 8722, 8724, 8726
 Hull and White stochastic volatility model, average integrated variance 8790
 Hull-generating walks 6527
 Human 149
 Human activity systems, dynamic complexity 4563
 Human brain core 1627
 Human choice behavior 9432
 Human development
 complexity 1874, 1875
 dynamic systems 1880
 Human ethology
 cohesion vs. resistance 4612
 dynamics 4611
 ethological issues 4613
 human ethological resistance 4619
 Human genome project 417, 9093
 Human health
 climate change 1095
 ozone hole 1099
 Human intestinal absorption (HIA) 2126, 2145, 2167
 Human life 3280
 Human perception 9434
 Human–robot interaction (HRI) 1225, 4643, 4644
 Human serum albumin 2121
 Human serum protein 2187
 Human serum protein binding 2145
 Human sexual network 4660
 Human sociopolitical dynamics 4610, 4623
 synchronization 4619
 HUMIES 4138
 Hund's first rule 4824
 breakdown of Hund's first rule 7317
 Hurewicz pointwise ergodic theorem 3058
 Hurricane Katrina 3132
 Hurst exponent 3711, 3757, 3760, 3768, 3899, 9844
 generalized 3768
 Hurst scaling exponent 8712
 Hybrid additive rules 65
 Hybrid approach, CAP2 1116
 Hybrid arc 4676
 Hybrid composite 1298
 Hybrid computer 275, 276
 Hybrid control 6284
 Hybrid control systems 9105
 Hybrid neural networks 4404
 Hybrid oscillator 5725
 Hybrid seed corn 8307
 Hybrid time domain 4675
 Hybrid, well-posed 4675
 Hybridization 691
 Hydraulic diffusivity 2685
 Hydrodynamic field 4382
 Hydrodynamic limit 7808
 Hydrodynamic Stokes radius 6840
 Hydrodynamics 549, 4382
 Hydrogen plasma 8583
 Hydrological cycle 7597
 Hydrological modeling 9015
 Hydrophilic 9752
 Hydrophobic 9752
 Hydrophobic effect 854
 Hydrophobicity 2169, 2200
 Hydrothermal system 6958, 6969
 Hydrovolcanism 9793
 Hyman, J. 88
 Hyper-netted-chain 8576, 8583
 Hyper-space, special fuzzy functions 4084
 Hyper-universe 6302
 Hyperbolic 2268, 8635
 infinitesimal 8635
 Hyperbolic attractor 4731
 Hyperbolic distribution 3420
 Hyperbolic dynamical system 989
 Hyperbolic ensembles 7507
 Hyperbolic equilibrium 4516
 Hyperbolic linear system 4725
 Hyperbolic measure 3023
 pointwise dimension 3023
 Hyperbolic set 4728
 Hyperbolic system 999, 4716
 Hyperbolic toral automorphisms 996, 8645
 Hyperbolicity 953, 8644
 Hypercycle 120, 3292, 8045
 Hyperfine qubit 7229

- Hyperfine state 9685
 Hyperfine state qubit 7224
 Hyperfine structure 6734
 Hyperfinite coin-tossing, definition 6308
 Hyperfinite equi-partition 6296
 Hyperfinite random walk, definition 6308
 Hyperfinite set, continuous function 6296
 Hyperfinite time-axis, definition 6307
 Hypergraph 585, 586, 8355
 Hyperion, chaotic rotation of 373
 Hyperreals 6292, 6295
 definition 6292
 Hyperredundant manipulators 1476
 Hyperscaling relation
 breakdown 1599
 polymer physics 6819
 Hyperstatic 6013, 6016
 Hypo-elliptic 2263, 2269
 Hypocenter 2396, 2474
 Hypostatic 6013, 6016
 Hypothalamic-pituitary-adrenal (HPA) system 1922
 Hypothesis 6252
 on C^∞ -norm 946
 Hypothesis space 5349
 Hypothesis testing 6000
 Hysteresis 1548, 4894, 5023, 5720, 6636
 Hysteresis effect 9284, 9373
- I**
- ICAPM 3396
 Ice sheets 1712
 ice sheet dynamics 1712
 land ice models 1713
 Iceberg orders, market microstructure 5393
 ICEO 5581
 ICER 9242
 Icosahedral crystal 4229
 60-Icosahedral periodic minimizers 5970
 ID3 1827
 Ideal 703
 maximal 1030
 Ideal chain 6818
 Ideal non-interacting chain 6813
 Idealism 9063–9065
 Ideas and behaviors 8307
 Idempotent network 8296
 Identifiability 5553
 Identification 444, 447, 449, 9105
 of the cellular automaton 4739
 partial identification 5560
 point identification 5560
 Identity 1905, 8037
 Idiosyncratic errors 2772
 If-then rules 4011
 Ig-like β -sandwich 7040
 Ill-conditioned problems 9188
 Ill-posed linear problems, solution of 9187
 Bayesian approach 9191
 Ill-posed problems 10001
 Illusion of life 1337
 Image 1719, 3136, 6391, 6394
 binary symbol 6399
 column 6400
 complex-valued 6396, 6398
 geometry 1719
 matrix 6399, 6400
 processing 1719
 row and column 6399
 stack 6399
 two-dimensional 6396
 Image-based feedback 1225
 Image-based state estimation 1225
 Image compression 10031
 Image graph 8273
 Image inpainting 10031, 10039
 Image interpolation 10039
 Image Jacobian 48, 52
 Image processing 6856
 edge detection 6904
 image decomposition 6904
 image denoising 6904
 image reconstruction 6904
 LSI circuits 9713
 Image restoration 10031
 Image segmentation 10031, 10039
 Image-space 44
 Image-space trajectory 51
 Imaging 7892
 Imitation 6486, 8308
 human–robot interaction 4651
 Imitators 1960
 Immergence 8407

- Immigrant agents 155
 Immigration rate 2707
 IMMSIM 127
 Immune network 4777, 4781
 Immune system, homeostasis 4779, 4784
 Immunization 6498
 Immunocomputing 4739, 4746
 Immunology 4777
 IMMUNOS 2132
 Immunosuppressive peptide 2208
 Impact 3112
 disaster 3126
 Impact fracture 3803
 Impasse 5196
 Impedance of the vacuum 33
 Imperfect information 4072
 Imperfect rationality 5431
 Imperial County Services (ICS) building 2385
 Imperial Valley earthquake 2385, 2387
 Impermeable 6209
 Impersonating profiles 4376, 4377
 Implementable social choice rule 4788
 multiple implementation 4799
 truthfully implementable 4794
 Implementation 4097
 Implication 4877, 4879
 Implicit function theorem (IFT) 5066, 5083, 5300,
 6588, 6593, 6594
 continuation 6594, 6595
 Implied volatility
 short definition 8783
 Importance sampling 2450, 2459, 5668, 5676,
 6995
 Impossibility theorem 205, 9944
 Imprecise information 4060
 Imprecise probabilities, fuzzy logic 4005
 Imprecision
 fuzzy logic 3986
 type-2 fuzzy logic 4011
 Impulse 6955, 6957
 Impulse response analysis 2387, 2390
 Impulse response function (IRF)
 linear 3515
 nonlinear 3516
 Impulse responses 2383
 Impulsive system 4693
 Impurities 5750, 5770, 7343
 Imputation 1520
 Imputation set 1664
 IMS *see* International monitoring system (IMS)
 In 3294
 In-phase 1545, 5720
 In-phase synchronization 631
 In-plane 700
 In-plane stiffness 699
 In-vehicle traffic prediction 9529
 Ince–Strutt diagram 2323, 2327
 Incentive 6978
 compatibility 5514, 5519
 compatibility constraint 6982
 Incidence matrix 6241, 6837
 Incipient 7827
 Incipient infinite cluster 1412
 Inclusion model
 crack model 2688
 oblate spheroid model 2687
 tube model 2687
 Incoherent type I motif 564
 Income 2823
 income diffusion 2817
 income distribution 2813, 2816, 4925
 income prediction, fuzzy system models 4091
 income temperature 2813, 2817, 2818
 Incompatibility
 geometric 4184
 kinematic 4185
 principle, fuzzy logic 4006
 Incomplete data 7798
 Incomplete information 1588
 on one side 433
 on two sides 434
 Incompressibility theorem for injective cellular
 automata 2984
 Incompressible fluid motions 3643
 Incompressible fluids 5929
 Incompressible viscous fluids, Navier–Stokes
 equations 5926
 Incompressible words, c-incompressible 247
 Inconsistent belief 434
 Inconsistent data 7800
 Increasing returns 208
 Increasing returns to scale 1680
 Incremental approach 4313
 Incubation distributions 9042

Indegree 6241
 Independence 6998, 8722, 9944
 contextual 1867
 Independent increment
 finite-rank 6308
 hyperfinite-rank 6308
 Independent loop set (ILS) 8949
 Independent sets 173
 Independent two-path 8327
 Indeterminacy 4049
 Index 6246, 7011
 of a network 8296
 of cyclicity 6243
 of memory 1627
 Indexical information 2315
 Indian Ocean earthquake 8513
 Indian rod trick 2338
 Indian rope trick 2337
 Indicator 3303
 economic 3307
 Indifferent fixed point 6951
 Indirect dominance 6027, 6035
 Indirect evolutionary approach 5686
 Indirect inference 217
 Indirect interaction models 192
 Indiscernibility 4412
 Indiscernibility relation 7755, 7787, 7788, 8338
 Individual rational level 7628
 Individual rationality 1664
 Individual timestep 8696
 Individual timestep scheme 8696
 Individually rational payoff 7618
 Induced F \uparrow S transition 9364, 9374
 Induced fuzzy parameter 8684
 Induced OWA 230
 Induced traffic breakdown 9284, 9320
 Induced transformation 2973, 4985
 Induction 214, 1826
 Inductive inference 1828
 Inductive learning 5188, 5193, 5194
 generalization 5199
 negative examples 5198
 positive learning examples 5198
 specialization 5199
 Industrial dynamics 9059
 Inertia 6003
 Inertia tensor, locked 5503

Inertial Alfvén waves 25
 Inertial frame 6426, 6427
 Inertial glut 9906
 Inertial manifold 4593, 8646
 Inertial range 3653
 Inexact concept 1791
 Infancy 1901
 Infective individual 6779
 Inference
 non-monotonic 6930
 non-parametric statistical inference 464
 parametric statistical inference 464
 Infimum 5462
 definition 6290
 Infinite cluster 2840
 Infinite-dimensional control system 4805
 Infinite-dimensional controllability 4804
 examples 4805
 Infinite-dimensional Hilbert space
 quantum mechanics 7370
 Infinite-dimensional torus 6716
 Infinite ergodic theory 2971
 Infinite iterated function systems 3020
 Infinitely divisible stationary processes, ergodic
 theory 3076
 Infinitesimal 4343, 4344, 6292
 non-Archimedian 6290
 Infinitesimal decrease 6273, 6280
 Infinitesimal difference 6286
 Infinitesimal equivariance 5484
 Infinitesimal generator 947
 Infinitesimal granules 4313
 Infinitesimal hyperreals 6293
 Infinitesimal nonequivariance two-cocycle 5486
 Infinitesimal rigidity 3102
 Infinitesimal time evolution operator, quantum
 simulation 7385
 Infinitesimally free action 5486
 Infinitesimally hyperbolic 8635
 Inflation 1634, 5329
 Influence 5999, 6009, 8317
 Influence diagram 1854, 1856, 1860
 Influence measure 8959
 Information 1552, 3275, 8947
 agency problems 5411
 asymmetric information (information
 asymmetry) 5410

- biological 498
- context-dependent 1556
- coupling 1552
- functionally meaningful 1540
- informationally meaningful 1552
- intention to change 1556
- loss 3875
- non-fundamental information 5418
- on aminoacid composition 4827, 4828
- on proton–neutron composition 4824
- on vertex degree distribution 4829
- on weighted distribution 4828
- which-way 3871
- Information adaptation 7953
- Information-based complexity 7119
- Information-based models, market microstructure 5397
- Information-bottleneck, network module 505
- Information compression 7953
- Information content
 - of a chemical element 4822
 - of a nuclide 4822
 - of a structure 4822
 - of atomic nuclei 4824
 - of molecules 4826
 - of networks 4834
- Information costs, market microstructure 5397
- Information curve
 - modular network 506
 - NIB algorithm 506
- Information descriptors of compositional complexity 4828
- Information economics 6977
- Information equations for periods and groups of chemical elements 4823
- Information exchange 1555, 8199, 8200, 8203
- Information extraction (IE) 8094
- Information flow 5286
- Information for atomic (chemical) composition 4827, 4828
- Information fusion 224, 226, 4404, 5741
- Information gain 1831
- Information granularity 4360
- Information granulation and integration 4341
- Information granule 1777, 4403, 7740, 7787
- Information hiding 4329, 4330, 4335, 4351
- Information inflation 7953
- Information integration 224, 226, 1433, 4351, 4366
 - minimum information bipartition 1433
- Information integration theory of consciousness 1434
- Information measure of statistical memory 1616
- Information memory measure 1624
- Information models 4305
- Information overload 3138
- Information processing 4893
 - in artificial chemistry 341
- Information set 4417, 4420, 4862
- Information spreading 6061
 - Daley and Kendall 6061
 - rumor 6061
- Information system 1533, 1793, 4359, 4396, 4420, 7788, 7790
- Information table 4314, 7755
- Information technology 2349
- Information theory 734, 2713
 - biomolecular sequence 494
 - ecosystems 2707
 - module 505
 - optimizing information flow 735
- Informational complexity
 - evolution 505
- Informational forcing 1556
 - complementary 1556
- Informational rent 6984
- Informed traders 5397, 5398
- Infovis 1256
- Infrasonic wave
 - propagation 4842
 - propagation modeling 4844
 - travel time curve 4842
- Infrasound 1219, 4839
 - acoustic speed 4841
 - acoustic velocity 4841
 - analysis method 4841
 - basic principle 4840
 - earthquake 4839, 4841
 - measuring 4840
 - tsunami 4839, 4845
 - volcano 4839, 4848
- Infrasound array 4840
- INGV 2405
- Inheritance, definition 6289

- Inhibition
 feedforward 6112
 global 6106
 recurrent 6109
- Inhibitor 6461, 6467, 6468
- Inhomogeneous earthquake fault 5024
- Inhomogeneous fault zone 5035
- Initial-boundary value problem 5930, 5943
- Initial configuration 3235
- Initial crack, earthquake nucleation process 2540
- Initial seeding 8315
- Initial set 4497
 fills space 4499
- Initial submanifold 5491
- Initial value problem 3257, 9225
- Injection mechanism 27
- Injective 64, 65, 70, 71
 cellular automata 2983
- Injectivity 7680
- Ink jet printer 5574
- Inner Lindblad resonance 412
- Innovation 1956, 8308
- Innovators 1958
- Inpainting 1719, 10006, 10032
- Input 6102, 8617
 rhythmic 6105
- Input layer 1815
- Input-output transformation function 214
- Inquiry system 7850
- InSAR 4264
- Insects 284
- Insight 7851
- Inspection games 4096
- Inspector leadership 4855
- Instability 4181, 6117, 6434, 8001, 8003, 8040, 8927
 absolute 6470, 6473
 Benjamin–Feir (self-focusing) 6469
 Eckhaus 6463, 6464, 6469
 geometric 4184
 meandering 6471
 Mullins–Sekerka 6466
 of a fixed point 8930
 of a limit cycle 8932
 of tori 8932
 oscillatory 6468
 physical 4183
- traveling 6468
 zigzag 6463, 6468, 6469
- Instability pockets 6626
- Instability tongues 6626, 6630
- Installed base 1965
- Instant-runoff voting 9948
- Institution
 market institutions 4624
 network economic 4624
- Institutional barrier 3125, 3136
- Institutional economics 8996, 8998
- Institutional learning 7851
- Institutionalist economic models 2285
- Instrumental variables 5560
 causality 5560
 LATE 5565
 local instrumental variables 5565
 natural experiments 5560
 weak instruments 5564
- Instrumentalism 9063
- Insulator–conductor 3850
- Insurance 6977, 8127
- Integer factorization 5478
- Integrability 6770, 7164, 8481
- Integrable 2263
- Integrable affine structure 4527
- Integrable system 401, 995, 1376, 2263, 4516
 integrable 6176
- Integral calculus 6298
- Integral inequality 1495
 nonlinear 1497
- Integral (of motion) 2263, 4515, 5447, 6429
- Integral operators 3338
- Integral scale 3642
- Integrate-and-fire 6101
- Integrated genetic-fuzzy problem
 for items with a single minimum support
 (IGFSMS) 4152
 for items with multiple minimum supports
 (IGFMMS) 4154
- Integrated molecular circuit 5654
- Integration 1430, 1881
 limit problem 2220
- Integration error 8993
- Intelligence 1901, 8869–8871, 8878
- Intelligence systems 7851
- Intelligent agent 1335

- Intelligent control 1109
ISAC 1109
- Intelligent data analysis 1776
- Intelligent transportation systems 9433
- Intelligent work environment 1479
- Intensification of downstream congestion 9374
- Intensity 6389, 6394, 6399
- Intensity cross product 9855
- Intensity of a process 9834
non-parametric 9834
- Intensity spectral density 7921
- Intensive 2865
- Intentional
action 1876
behavior 1876
- Intentional dynamics
goal-directedness 1556
spontaneous movements 1556
- Intentional information
destabilizing 1556
stabilizing 1556
switching 1556
- Intentionality 4893, 8948
- Intentions 7542
- Inter-cell communication 820
- Inter-domain routing 4930, 4943, 4945
- Inter-onset time 9831
- Inter-person distance 3147
- Inter-story drift 2371, 2378, 2388
outstanding issues 2379
- INTERACT 5357
- Interaction 208, 724, 727, 5286
attractive 8483
elastic 8480
human robot 4643
inelastic 8480
nonlinear 8480
pathological 629
repulsive 8483
resonant 8480
synaptic 639
valley-orbit 5771
- Interaction-based simulation 161
- Interaction center 8491
- Interaction gain 2056, 2065, 5357
- Interaction networks 514, 516
protein 514
- Interactive dynamic visualization 1262
- Interactive multiobjective optimization 7778, 7782
- Interactome 723
- Interception models 1706
- Interconnect 5864
- Interconnect topology 927
- Interdealer market 5408
- Interdependent valuations 5520
- Interdisciplinary modeling 9032
- Interdisciplinary research 8928
- Interdisciplinary subject 3277
- Interestingness 1986
- Interface 2020, 6415, 8713
motion 873
- Interface boundary conditions 5918
- Interface growth 3372
- Interference 7169, 7669, 7671
- Interferogram 1692
- Interferometric synthetic aperture radar 1692
- Intergovernmental coordination group 9592
- Interim stage 435
- Interiorization 1885
- Interlocking directorate 8281
- Intermediate filament 1745, 1747, 1750–1752, 1754, 1768
- Intermediate-filament 1747
- Intermediate modularity 2732
- Intermediate normalization 6728, 6735
 ϵ_n 6728
- Intermediate phase 2833, 2837
- Intermediate-value, continuous function 6296
- Intermittency 3647, 3654, 4921, 6444, 7587, 8011, 8018
temporal intermittency 8019
- Intermittent 7584
- Intermittent flow 6487
- Intermittent turbulence 8526, 8535
- Internal correlation 7622, 7628
- Internal dynamics 2849
- Internal model 5719, 9079, 9085, 9086
asymptotic internal model property 9086, 9088
design of 9088
principle 9079, 9085
- Internal (or baroclinic) modes 6211
- Internal regulation 8041
- Internal revenue service 2813

- Internal solitary wave 8112, 8121, 8122
 Internal state decoherence 7237
 Internal waves 6206
 Internality 226
 International monitoring system (IMS) 4840
 International phonetic alphabet 2310
 International working group on rotational seismology 2525
 Internet 3138
 Internet topology 4930–4934, 4936, 4939, 4940, 4942, 4943, 4945
 Interpersonal communication 8307
 Interpersonal contact 8308
 Interpersonal coordination 8200, 8201, 8422, 8423, 8429
 synchronization 8429, 8430, 8432
 Interpersonal influence 8308
 Interplanetary shocks 22
 Interpolation 594
 fuzzy logic 3987
 Interpolatory masks 595
 Interpretation 7734
 redundant 7734
 Intersection 3146, 4148, 4877
 of two fuzzy sets 4066
 per fracture 6511
 type-2 fuzzy sets 4012
 Interseismic deformation 1694, 4267
 Interstellar medium 393, 3279
 Interval arithmetics 8682
 Interval computing 4403
 Interval exchange maps 2959
 Interval exchange transformation 2920
 Interval maps 962, 2962, 6951
 β -shifts 2962
 Continued fraction map 2962
 f -expansions 2962
 Farey map 2962
 piecewise C^2 expanding maps 2962
 Smooth expanding interval maps 2961
 Interval type-2 fuzzy logic systems (IT2FLS) 4014
 Interval type-2 fuzzy sets 4013, 4014
 Interval-valued FSs 4013
 Interval-valued type 2 fuzzy sets (IVT2FS) 4082
 Intra-plate earthquakes 9584
 Intra-species evolution 2701
 Intractable conflict 8425
 Intractable mechanical simulation 5473
 Intrinsic absorption 7918
 Intrinsic dynamic moduli 6850
 Intrinsic dynamics 1556, 8420–8422, 8425, 8429, 8430, 8432
 internal states 8429
 Intrinsic evolution 339
 Intrinsic metric Hamilton–Jacobi equations 4551, 4552
 Intrinsic viscosity
 in the freely draining condition 6848
 in the non-draining condition 6846
 Intuitionistic sets 7739
 Intuitive logics 7835
 Invariance
 ergodic theory 6944
 scale 3864
 Invariance principle 4676
 Invariance relation 6188
 elementary 6188
 Invariant curve 6436
 Invariant manifold 937, 6189, 6768
 Invariant measure 2982, 4724, 6232, 6943, 9240
 entropy 6944
 ergodic theory 3017, 6943
 Invariant measures for cellular automata 2983
 domains, defects, and particles 2991
 Furstenberg conjecture 2990
 maxentropy measures 2984
 measure rigidity 2988
 periodic measures 2985
 posexpansive and permutative CA 2985
 uniform measure 2983
 Invariant scaling 8543
 Invariant set 9225
 Invariant tests 6255
 Invariants 9231
 method of 5497
 of the motion 4599
 Invasion
 tumors 914
 Turkish 7843
 Invasion percolation 4947, 4948, 6569
 algorithm 4949
 correlated heterogeneity 4956
 fractured system 4957
 gravity 4951

- lattice topology 4955
 method 4949
 modification 4950
 pore scale geometric correlation 4955
 pore scale structure 4951
 pore topology 4952
 stratification 4957
 trapping threshold 4955
 viscous force 4951
 wetting 4951
 Invasion percolation simulation 4958
 Invasion percolation cluster 4957
 Invasive tumor
 Anderson's model 917
 effects of directed cell motion 916
 morphology 914, 916
 spatial structure 916
 Inventory 5410, 7835, 7847
 Inventory models, market microstructure 5395
 Inverse cascade 8727
 Inverse cubic law 3413
 Inverse function theorem 5084
 Inverse limit 431, 2975
 Inverse participation ratio (IPR) 8394
 Inverse problem 2450, 6213, 9631
 Inverse refraction diagram 9594, 9632, 9637
 Inverse scattering problem 4960, 4962, 4963
 Inverse scattering transform (IST) 4960, 8114,
 8118, 8119, 8466, 8481, 8505
 Inverse semigroup 8297
 Inverse theory 1695
 Inversion 2450, 8861
 Inverted pendulum 2424
 Inverted random void model 1450
 Inverted-V electrons 34
 Involution 6628
 Inward matrix product 7428, 7444, 7454, 7455
 Io–Jupiter interaction 33
 Ion–ion entanglement, quantum computing 7244
 Ion mobility 5577
 Ion–photon entanglement, experimental setup
 7245
 Ion–photon entanglement, quantum computing
 7244
 Ion string, vibrational cooling 7226
 Ion trap
 diagram 7223
 large-scale 7223
 technology 7221
 Ion-trap cavity-QED 7245
 Ion, quantum computing 7220
 Ionic qubit, state detection 7229
 Ionization, quantum computing 7225
 Ionosphere
 GPS-TEC 2629, 2632
 total electron content (TEC) 2622
 IPCC 7845
 fourth assessment report 1711
 Iron law of wages 2285
 IRR 4933, 4934, 4936, 4944
 Irrational behavior 9416
 Irrational decision making 4976
 Irreducible representation 8935, 8936
 Irreducible shift space 8894
 Irrelevant feature 5349
 Irreversibility 3859
 Irreversible phase transitions (IPTs) 7573
 IS-LM model 8992
 IS-LM/AD-AS model 8994
 Isaacs 1953
 Ishii's lemma 6221, 6222
 Ising 6783, 7825
 Ising chain 6950
 Ising domain wall 8713
 Ising Hamiltonian 8712, 8715
 Ising model 728, 873, 1602, 4911, 5671, 5676,
 6381, 6806, 7569, 8709, 8713, 8714, 8726
 critical exponents 1602
 Ising clusters 1602
 Ising droplets 1603
 random field 6416
 Ising spin glass 8727
 ISIS communication system 265
 Islands 8254
 Hawaiian 8852
 simple 8256
 ISNet 2399
 Iso-energetic KAM tori 5081
 Iso-energetic Poincaré-mapping 4523
 Iso-energetic poincaré mapping 2263
 Isobaric 6209
 Isochors, biological fractals 3795
 Isochronous 8639
 Isodefective nuclides 4825

Isoelectric focussing 5580
 Isolated chain component 9235
 Isolated invariant set 9233
 Isolated state (internal state) 4348
 Isolating neighborhood 9233
 Isomorphic 5461
 Isomorphic configurations 5618, 5625
 Isomorphic transformation, Bernoulli shift 4988
 Isomorphism 3055
 Bernoulli property 4988
 Bernoulli shifts 4986
 finitary 4990
 Ornstein's theorem 4987
 Isomorphism invariant 4984, 4985
 Isomorphism theory 4983
 action of amenable groups 4993
 transformation factor 4993
 Isomorphy principle 8934
 Isophote direction 10040
 Isosceles symmetry 5973
 Isostacy 5015
 Isostatic 6013, 6016
 Isostatic network 2834
 Isostatic structures 2835
 Isostaticity 5013, 5016
 Isotope, quantum computing 7225
 Isotopic number 4824
 Isotropic 2263, 7527
 Isotropic compression 5012
 Isotropic diffusion 10037, 10039
 Isotropic dilation matrix 589
 Isotropic networks 6514
 Isotropic scattering model 7923
 Isotropic scattering process 7916
 Isotropic undecimated wavelet transform 6360
 Isotropic wavelet transform 6362
 Isotropy subgroup 5487
 Israel 7844
 IST method 4962
 Istanbul 2398
 IT2 FS *see* Type-2 fuzzy systems
 IT2FLS *see* Interval type-2 fuzzy logic systems
 Italian symmetry 5970
 Iterated exponential 618
 Iterated function systems 3019
 Iterated integral functionals 1035
 Iteration of functions 3833

Iterative array 800, 803
 Iterative diagonalization 7349
 Iterative estimation methods 8230
 Iterativeness 1880
 Ithiel de Sola pool 8277
 IThink 7843
 ITPFI transformations 3068
 IV
 continous-time SV jump-diffussion model 8787
 IV and cumureative squard jump component decomposition 8787
 Iwo Jima, Japan 2605

J

J-Curve 4928
 J-Measure 1831
 Jackson–Moser–Zehnder, lemma 5079
 Jackson–van den Nouweland rules 6026
 Jackson–Wolinsky rules 6026
 Jacobi elliptic 8116, 8119
 Jacobi elliptic function 8116, 8119
 Jacobi rotation 7441
 Jacobi, C.G. 5444
 Jacobian estimation 54
 Jacobian ideal 704, 712
 Jacobi's elimination of the node 5492
 Jacquard, Joseph-Marie 5476
 Jahn–Teller effect 6690
 Jam interaction effect 9376
 Jammed 5007, 5008, 5014
 collectively 5014
 locally 5014
 strictly 5014
 Jamming 2834, 3144, 4997, 5011, 5017
 anisotropic 5017
 isotropic 5017
 Japan 2398, 7846
 Japanese firms 7845
 Japanese Meteorological Agency 2398, 9593
 JAUS 8438
 JAUS reference architekture (RA) 8439
 Java 423
 Java programming and security issues 5610
 Java-sandbox security model 5611
 Java virtual machine (JVM) 5607

Jay W. Forrester 4577
 Jaynes 8936
 Jellium 8576, 8579
 Jensen–Shannon information divergence 4829
 Jensen’s inequality 6946
 Jerky response 5022
 Jevons’ logic 5477
 Jevons, William Stanley 5477
 JMA magnitude 9599
 John Scott Russell experiments 8465
 Johnson’s equation 9996
 Join 5462
 Join of subshifts 9257
 Joining 2976, 3055, 5040
 composition of joinings 5043
 ELF property 5049
 filtering problem 5049
 Markov intertwining 5043
 minimal self-joinings 5044
 pairwise independent joining 5048
 relatively independent joining 5042
 self-joinings 5044
 simple 5045
 Joint architecture for unmanned systems (JAUS) 8439
 Joint attention 1897
 Joint homomorphism 8301
 Joint plan 7642
 Joint probability distribution 372, 3580
 of the matrix elements 7509
 Jointly controlled lottery 1591, 7645
 Jointly periodic point 9250
 Jones polynomial 7110
 Jordan canonical form 6651
 Jordan chain 6247
 Jost solution 4965, 4966
 Jourjine 8844
 JPEG 10032
 JPEG2000 10032, 10040
 Julia set 3706, 3828, 3841, 4992
 Jump length distribution 5220
 Jump process 8734
 Justification 9065–9067
 in system dynamics 9067
 JVM *see* Java virtual machine
 JXP method 5281

K
 K-Automorphism 3063
 k-Cohesive groups
 connected 4608, 4611
 connectivity-k 4616
 k-components 4613, 4616, 4627
 k-connected groups 4618
 scalability 4611–4613, 4616–4618, 4625
 k-Cohesive resistance 4611
 k-Core percolation 2836
 k-Core representation 1264
 k-Cores 575
 K-Descriptive language 4399
 k-Means 5053
 k-Means clustering approach 1149, 4153
 k-Nearest neighbors 1992, 2168
 k-plex 8288
 K-Property 2929
 ergodic theory 3062
 k-Ring 8254
 k-Satisfaction 4400
 k-Satisfaction relation 4400
 k-Skip bipower variation 8789
 K-Space solution 7487
 k-Star 8327, 8329
 k-Subwebs 2716
 K-System 401
 k-Triangle 8327, 8329
 K-Truth 4400
 k-Two-path 8327
 K_a/K_s 5657
 Kadanoff block construction 8712
 Kadomtsev–Petviashvili equation 6456, 8118, 8512, 9994
 Kagan–Jackson models 2567
 Kaiser–Stebbins effect 1653
 Kakutani equivalence, isomorphism theory 4991
 Kalman 3526
 Kalman controllability decomposition 3527, 3534
 Kalman filter 3688, 4753, 4769, 8797
 Kalman’s observer, state-linear systems 6377
 KAM 6681, 6683
 KAM *see also* Kolmogorov–Arnold–Moser (KAM)
 KAM method 3103
 KAM stability 5993

- KAM theorem 404, 2342, 8641
 KAM theory 1933, 4516, 6674, 6710, 7165
 Kamikawa 3553
 Kane's computer 5750
 Kaplan–Yorke conjecture 3023
 Kaplan–Yorke–Young formula 1002
 Kaplansky I 781, 788–790
 Kaplansky zero-divisor problem 788
 Kaplansky's conjecture on stable finiteness of group rings 789, 790
 Kardar–Parisi–Zhang equation, quenched 1138
 Karman's equation 3657
 Karush–Kuhn–Tucker (KKT) theorem 4088
 Kasteleyn–Fortuin 7825
 Katmai 2607, 2612, 2614
 Kato bound 6739
 Kato–Rellich theorem 6738
 Kauffman bracket 7111
 Kauzmann temperatures 4213
 Kawahara equation 6456
 KD systems
 first-generation 1985
 second-generation 1985
 third-generation 1985
 KDD 4392
 KDDM model 1985, 1986
 KdV 5138–5142
 KdV–Burgers equation 10002
 KdV equation 5144, 5145, 5147–5156, 5162, 6213,
 8466, 8511
 third-order 84
 Keiretsu 7846
 Kelso paradigm 1545
 Kelso's finger experiment 8937
 Kelvin 273, 285, 5474
 Kemeny 9945, 9950
 Kemeny index 9956
 Kemeny score 9956
 Kemeny winner 9950
 Kemeny's procedure 9959
 Kendall–Wei ranking 6250
 Keplerian orbits 6428
 Kepler's equation 1935, 6672, 6677
 Kermack 6779
 Kernel 2176, 3339
 Kernel functions, support vector machines (SVM) 4087
 Kerner–Klenov stochastic microscopic three-phase traffic flow model 9346, 9349
 Kerner–Klenov–Wolf (KKW) cellular automata 9288, 9346
 Kerner's three-phase traffic theory 9303, 9501, 9503, 9513
 Kernighan–Lin algorithm 1147
 Kerr 7250, 7254, 7258
 Kerr effect 8475, 8484
 Kerr-lensing 6137
 Keynesian 2285
 Keynesian cross model 8994
 Keystone species 2713
 structural keystone 2735
 Khephera 3691, 3692
 Khinchin 2868
 Kibble mechanism 1642, 1645, 1646
 Kibble–Zurek mechanism 9680
 Kilauea volcano, Hawaii (USA) 4262, 9868
 baseline monitoring 9869
 Killer application 4139
 Kin selection 3213
 Kinase 2186
 Kindling 629, 639
 Kinematic models 1477
 Kinetic energy 7404, 8582
 organisms 2701
 Kinetic Monte Carlo 1315
 Kinetic shaping 2015
 Kinetic theory 1006
 Kinetically constrained lattice gases 4227
 Kinetically constrained models 4227
 Kinetics 856
 mass-action 329
 steady state systems 2701
 Kings 7017, 7018
 Kink 80, 84, 85
 Kinodynamic planning 5472
 Kirchhoff coda migration 7923
 Kirchhoff's Law 1405
 Kirkwood gaps 6443
 Kirkwook–Riseman chain 6839
 KKS *see* Kostant, Kirillov, Souriau
 KKW model 9290
 KKW-model 9288
 Kleiber's law, biological fractals 3784
 Klein–Gordon equation 6455

- KM algorithms, type-2 fuzzy logic 4017
 K(n,n) equation 84, 88
 Kneading invariants 968
 Knight problem 2098
 Knight relation 33
 Knill 7257, 7258
 Knot 7111
 Knot theory 9274
 Knowledge 4411, 7542, 7850
 Knowledge base 4871, 5538
 Knowledge discovery 4404, 7729
 data mining 1984
 Knowledge economy 8366
 Knowledge operation 4352
 Knowledge representation 4352, 4412, 8447
 Knowledge structures (KS) 4341, 4348
 Knowledge system 4396
 Koch curve 3702
 Kochen, Manfred 8277
 Kohn–Luttinger 5771
 Kohonen map 1822
 Kohonen network 4873
 Kohonen self-organizing maps 1784
 Kolmogoroff scaling exponent 8727
 Kolmogorov 704, 5067, 5068, 5074, 6664
 normal form 5067
 set 5074
 transformation 5068
 Kolmogorov -4/5 Law 3653
 Kolmogorov–Arnold–Moser (KAM) invariant surface 6195
 Kolmogorov–Arnold–Moser (KAM) theorem 383, 6203
 Kolmogorov complexity 245, 492, 5439
 conditional 493
 given a representation system 244
 mutual 494
 Kolmogorov endomorphism 3002
 Kolmogorov equations 9225
 Kolmogorov forward equation 2801
 Kolmogorov group, property 8555
 Kolmogorov operator 6231
 Kolmogorov probability space 6301
 Kolmogorov scales 3651
 Kolmogorov–Sinai entropy 989, 992, 1001, 1006, 1007, 4737, 4986
 Kolmogorov spectrum 29, 31
 Kolmogorov typicality 953
 Kolmogorov’s algorithmic information 4829
 Kolmogorov’s method 6666
 Kolmogorov’s theory 3642, 3654
 Kondo effect 7344, 7351, 7355, 9647
 Kondo energy 9647
 Kondo resonance 7352
 Kondo temperature 7352
 Kondo tunneling 9647
 spin- $N/2$ Kondo effect 7357
 SU(4) Kondo effect 7355
 two-stage Kondo effect 7354
 Kondo model 7345
 two-channel 7356
 two-impurity 7353
 König, René 8267
 Koopman operator 2921
 Korean family planning study 8311
 Kornienko 8944
 Korteweg and de Vries 8504
 Korteweg–de Vries equation 5144, 5155, 6138, 6454, 6709, 6712, 8115, 8122, 9970, 9983, 9984, 9988, 9993
 Korteweg, D.J. 81, 84, 8114, 8115
 Kostant, Kirillov, Souriau coadjoint form 5487
 Kosterlitz–Thouless transition 1276, 9680
 Krakatau, 1883 9786
 Kramers chain 6839
 Kramers equation 8778
 Kramers–Moyal coefficients 3584
 Kramers–Moyal expansion 3593, 8773
 Kramers problem 5229
 Krause–Hegselmann model 6385
 Krauß-stochastic microscopic traffic flow model 9336
 Krein collision 2263
 Krengel’s entropy 3071
 Krieger generator theorem 4986
 Kripke semantics 8340
 Kronecker factor 2927
 Kruskal, M.D. 84
 Krylov–Bogoliubov theorem 957, 6232
 kth pOwer of a fuzzy set 4068
 Kuhn, Thomas 2860
 Kuhn’s theorem 5179, 7617
 Kuiper belt 387, 6445

Kullback–Leibler distance, stochastic processes 3585
 Kullback–Leibler information 3518
 Kuramoto model 5242, 8913
 Kuramoto–Sivashinsky equation 6467
 Kurokawa 8840
 Kurtosis 3407, 5418
 excess 3407
 Kutrib 3552
 Kuznets hypothesis 2820
 Kyle model 5400
 Kyoto protocol 9029

L

L-Shaped mapping 3559
 L^∞ -spectrum, ergodic theory 3069
 L-Systems 119
 l_0 Minimization 10044
 l_1 Optimization 10044
 L2-norm 2407
 Lab on a chip 5574
 Labeled links SDCA model 8830
 Labeled walk 8291
 Labelled graph 9249
 Labor 2285
 Labor intensive 2285
 Labor productivity 2285
 Labour market model 8127
 Tesfatsions's 181
 Lack of information
 on both sides 7640
 on one side 7630
 Lacunarity 396, 478
 Lacunary sequence 3087
 Laflamme 7258
 Lagrange 2870
 Lagrange multiplier 5165, 10038
 support vector machines (SVM) 4087
 Lagrange–Poincaré bundles 5496
 Lagrange–Poincaré equations 5496
 Lagrange symmetry 5973
 Lagrangean submanifold 2261, 2263
 Lagrange's principle 8632, 8640
 Lagrangian 4555
 Lagrangian equilibrium 5994
 Lagrangian fluid dynamics 3658

Lagrangian map 3645, 3647
 Lagrangian point 414, 6681
 Lagrangian reduction 5495
 Lagrangian torus 4519
 Laing's molecular machine 334
 Lake ice 1707
 Laman's theorem 2830, 2838
 Lamarckian evolution 3209
 Lamb–Dicke limit, quantum computing 7236
 Lamb–Dicke parameter, quantum computing 7232
 Lamb–Oseen vortex 3645, 3646
 Lamb shift 6664
 Lambda-calculus 330
 λ -Discounted game 7633
 Lambda phage 422
 Lambda set 8288
 Lamellipodium 1742, 1743, 1746, 1749–1752, 1757, 1765, 1771, 1774
 Laminar 6489
 Laminar flow 6195, 6196
 Lance-Williams updating formula 5054
 Lanczos 5755
 block 5773
 Land surface schemes in GCMs 1707
 Land use 7983
 transport model 1062
 Landau 6665
 Landau–Ginzburg model 1645
 Landau–Hopf bifurcation 8931
 Landau level 8586
 Landau theory 8931
 Landau–Zener transitions 8609
 Landauer–Büttiker formalism 7296, 8600, 8608
 Landauer–Büttiker formula 7484
 Landauer, Rolf 1013
 Landauer's principle 7697
 Landers earthquake 2601, 4264
 Landesman–Lazer condition 6622
 Landscape matrix 2737
 Landslide 3824
 submarine 8851
 Lane formation 6481
 Langdon 3547
 Langevin 6104
 Langevin dynamics 3367, 3370

- Langevin equation 2877, 3365, 3370–3372, 4589, 5224, 5232, 5246, 5733, 8712, 8714, 8722, 8751, 8775, 8927, 8931, 8937
 dissipative 8752
 generalized 3577
 irreversible 8752
 Markov diffusion process 8752
 polymer physics 6813
 Langevin force 2031
 Langevin methods 730
 Langevin processes
 discrete 3577
 short time propagator 3580
 Langmuir–Hinshelwood mechanism 7573
 of surface reaction 1311
 Langton, Chris 8067
 Langton’s loop 118, 8070
 Language 2310, 3111, 3353, 6386, 6808
 fuzzy 7839
 of dynamics 1559
 Language development 1878, 1891, 1899, 1902
 Language evolution 1879
 Language family
 bracketed context-free 812
 context-free 808
 Dyck languages 812
 hierarchy 808
 linear context-free 809
 PSPACE complete 812
 recursively enumerable 812
 semilinear 812
 Language learner, real-time speech processing 2318
 Laplace 6663
 Laplace equation 9972
 ∞ -Laplace equation 6219, 6221, 6226
 Laplace expansion 1868
 Laplace operator 7443, 10037
 Laplace operator on a group *see* Laplacian (discrete), *see* Laplacian (discrete)
 Laplace pressure 3617
 Laplace’s limit 6672
 Laplacian 6241, 10042
 combinatorial 6241
 normalized 6241
 Laplacian (discrete) 782, 786
 Laplacian growth 3723
 Laplacian matrix 5354, 6250, 6837
 Laplacian score 5354
 Large deviations 7013, 7523
 Large deviations problems 6233
 Large earthquakes 2542
 aftershock 2550, 2551
 estimate of source processes 2549
 initial rupture processes 2550
 large amplitude waveforms 2543
 main phase 2543
 mainshock 2550, 2551
 observed waveforms 2543
 ordinary phase 2543
 P-waves 2543
 phases 2551
 velocity waveforms 2543
 waveforms 2549, 2550
 Large eddy simulations 3650
 Large- N expansion 7347
 Large networks
 architectural features 1201
 dynamics 1201
 Large-scale instability 6118
 Large-scale ion trap, quantum computing 7223
 Large scale simulations, agent-based
 modeling 148
 Larkin 1129, 1134
 Larkin model 2023
 Laser 8928
 Laser clocks 6169
 Laser cooling, quantum computing 7225
 Laser dynamics 6127
 Late heavy bombardment 6451
 Latency reduction 5614
 Latent attractors 8425
 Latent class models
 finite mixture model 5567
 information criterion 5567
 nonparametric maximum likelihood 5567
 Latent factor models, simulated likelihood 5564
 Lateralization 1902
 Lattice 1395, 3096, 6573, 6784, 8292, 8295, 8297–8299, 8301, 8303, 8304, 8356
 Archimedean 6579
 Galois 8356
 hexagonal 6583
 Kagomé 6585

- square 6583
 triangular 6583, 6585
 unimodular lattice 3029, 3032
 Lattice animals 6545, 6550
 Lattice Boltzmann model 883, 916
 Lattice coordination number 6507
 Lattice dynamics 8469
 Lattice gas 610
 Lattice gas automata 879
 Lattice-Gas reaction models 7576
 Lattice mismatch 5914
 Lattice molecular system 335
 Lattice percolation 6507
 Lattice property 9656
 Laumann, Edward 8268
 Laurent polynomial 10007
 Lava domes 9765
 Lava flow 9785
 Lavoie's 8119
 Lavoie's equations 8119
 Law 1540, 1558
 composition 3864
 Darcy 9775
 of requisite variety 8974, 8981
 of web surfing 10062
 scaling 3864
 Lawn movers 3690
 Lawton, W. 780, 785, 786
 Lax method 4960, 4963
 Lax pair 4963
 Layout format 1266
 Lazy learning 2168
 LCB *see* Long chain branched" (LCB) melt
 LCR algorithm 7713
 Le Lann–Chang–Roberts (LCR) algorithm 7718
 Lead compound 2197
 Lead time 2407
 Leader election 7713, 7717
 Leader, amorphous computing 264
 Leadership 9048
 adaptive leadership 8369
 administrative 8369
 enabling 8369
 strategic 8369
 Learnability 5183
 of language 1878
 Learning 128, 280, 1557, 1827, 1886, 2143, 2854, 5177, 6083, 8370, 9105
 argument 4103
 asymmetrical avoidance behavior 6477
 automaton 4739
 Bayesian 5179
 belief 5179
 classifier system 121, 128, 4739
 cycle, IPRD 7851
 deterministic 5178
 evolution 1879
 game 1862, 4097
 Kalai and Lehrer (KL) 5182
 laboratory 9050
 learnable best response property (LBR) 5182
 machine learning 128
 neuro-fuzzy systems 6094
 non-supervised 8194
 organization 7057
 organizational 7851
 paradigms 1815
 process 6477
 rate 1817, 1820, 1823
 rational 3378
 reinforcement 6084
 reinforcement learning 128
 rule 1813, 1815
 sophisticated 5177
 stochastic 5178
 supervised 128, 6084
 teaching 1873
 unsupervised 128
 Least-squares 3352, 3355
 Least-squares estimator
 damped 9189
 generalized 9193
 ordinary 9189
 Least-squares method 5208
 Leath 7824
 Leath method 6523
 Leave-one-out validation 1816
 Lebesgue density points 2281
 Lebesgue space 5461
 LEDA 1256
 Ledrappier–Young theorem 3023
 Legendre 2863
 Legendre polynomials 6677

- Legendre transform 8540
 Legendre transformation and reduction theory 5496
 Legislative processes 7060
 Lehmer mean 229
 Lehmer, Derrick 5478
 Lehmer's number sieve computer 5478
 Leibniz 7837
 Leibniz' product rule, differentiability 6298
 Leibniz program, definition 6289
 Leibniz, Gottfried Wilhelm von 5476
 LEM2 algorithm 1799, 7798, 7799
 Lemma of Neyman and Pearson 4860
 Length
 bootstrap percolation 610
 Compton 3874
 fractal 3862
 Planck 3868
 Length-clamp 7033
 Length-scale 3868, 3929
 invariant 3868
 Lennard-Jones polymer 6823
 Lenses 1264, 6394, 6399
 Leontief, Vassily 2793
 Leptokurtosis 3404
 LERS 7798, 7800
 Lesche stability 2861
 Level 6246
 of detail 1264
 of social reality, macro level 8427
 operational 3155
 strategic 3155
 tactical 3155
 Level crossing 6727, 6737
 Level repulsion 7166
 Levels of interoperability 352
 Levels of social reality
 levels of description 8427
 macro level 8422
 macro level of description 8427
 micro and macro levels 8427
 micro level 8427
 Leverage 9044
 Lévi-Strauss, Claude 8274
 Levine, Joel 8268
 Lévy flight 5223, 6203
 Lévy flight foraging 3792
 Lévy flights 3725, 5220, 6195
 Lévy noise 3577
 Lévy process
 stochastic processes 3578
 Lévy processes 3584
 short time propagator 3580
 Lévy–Smirnov distribution 5221
 Lévy walk models 3792
 Lévy Walks 5232
 Lewin, Kurt 8267
 Lewis, D. 6928
 Lexical growth 1881
 Lexical knowledge 1888
 Li–Yorke pair 9237
 Liapunov exponent 384
 Liapunov function 2279
 Liberalization 4928
 Library screening 2170
 Libration 6684
 Vibrational Tori 6682
 Lie 6313
 Lie algebra 6317, 6761
 bundle 5505
 free 1036
 Nilpotent Lie algebra 6184
 semisimple Lie algebra 6184
 subalgebra 6317
 Lie bracket 3530
 Lie groups 2003, 5440, 6177
 derivative 6313, 6318
 group 6317
 left-invariant 5446
 Lie algebra 5446
 right-invariant vector fields 5446
 subgroup 6317
 Lie–Poisson bracket 5492, 5494
 Lie–Poisson bundle 5505
 Lie–Poisson reduction 5492
 Lie–Poisson structure 2263
 Lie series, exponential 1037
 Lie transforms 6180, 6633
 Liénard differential equation 6615
 Liesegang pattern 885
 Life 1550
 Life cycle 1059
 Life Era 3274

- Life forms 3274, 3280
 variety, describing solutions 2700
- Life span 1876
- Life span overview 1900
- Lifting
 multiwavelet 5853
 scheme 596, 6356
 step 10007
- Light bullets 6454
- Light signal control 1178
- Lighthill–Whitham–Richards traffic flow model 9329
- Likelihood function 445, 448, 459, 2450
- Likelihood test 2444
- Lim sup 9228
- Limit
 quantum 5863
 speed-of-light 5863
 thermal 5863, 5867, 5869
- Limit cycle 527, 528, 5724, 8927, 8930
 oscillators 1557
 stochastic processes 3586
- Limit measures and other asymptotics for cellular automata
 asymptotic randomization by linear cellular automata 2993
 Hilmy–Hurley centers 2998
 hybrid modes of self-organization 2996
 Kůrka–Maass μ -limit sets 2998
 Kůrka’s measure attractors 2999
 Milnor–Hurley attractors 2997
- Limit order 5418, 5433
- Limit order markets 5393
- Limit point bifurcation 6336
- Limit point of cycles 6336
- Limit pricing 8135
- Limit set 249, 4724, 6629, 9080, 9255
 of a given point 9081
 of a set 9081
 orbit 249
- Limit theorems, stochastic processes 3578
- Limited dependent variable (LDV) models 5554
 latent variable 5554
- Limited hyperreals 6293
- Limiting factors 8991
- Limiting point
 definition 6290
- Limits to growth 4634, 8997
- Linda coordination model 192
- Lindemann criterion 2026
- Lindenmayer systems 119
- Lindstedt 5080
 algorithm 6663
 series 1933, 6667, 6668, 6670
- Line diagram 8303
- Line graph 4666, 6837
- Line J for the downstream jam front 9387
- Line-narrowing 6125
- Line symmetry 5972
- Linear 1817, 8954
- Linear and quasilinear model 8960
- Linear autoregressive (abbreviated, AR) model 442
- Linear bounded automaton 170
- Linear CA 2981
- Linear cellular automata, asymptotic randomization 2993
- Linear damping 6635
- Linear dynamic system 8949, 9914
- Linear free energy relationships (LFER) 2200
- Linear functional, multiplicative 1030
- Linear Hamiltonian system 6433
- Linear interface model 1131, 1132, 1136
- Linear inverse theory 9909
- Linear ion trap
 quantum computing 7222
- Linear logic 5286
- Linear matrix inequality 8755
- Linear momentum 9907
- Linear neural networks 1817
- Linear nonequilibrium thermodynamics 5260
- Linear orders, single-peaked 9958
- Linear Paul trap, quantum computing 7221
- Linear plane waves 9969
- Linear polymers 6546
- Linear prediction 10012
- Linear program 6420
- Linear programming 5536, 5543
- Linear response 5233
- Linear scale of events 1622
- linear Schrödinger equation 9996
- Linear stability 6200
- Linear stability theory 6195
- Linear superposition 8480

- Linear system 3526, 8619
 controllability 4807
- Linear TDMA broadcast 2054
- Linear thinking 7840
- Linear transformation 171
- Linear vector space 5713
- Linear velocity 59
- Linear vs. nonlinear system 8952
- Linearization 6273, 6311, 6657
 continuous 6313
 formal 6312
 holomorphic 6324
 smooth 6313
- Linearization principle 3528
- Linearized equation 8634
 controllability 4814
- Linearized stability 8633
- Lines 8246, 8267, 8270
- Linewidth 6124, 6141
- Linewidth broadening 6118
- Linguistic expression 4883
- Linguistic quantifier 4074
- Linguistic structure 4342
- Linguistic uncertainty
 type-2 fuzzy logic 4011
- Linguistic variable 4069
 fuzzy logic 3986, 4004
- Linguistic words 4404
- Linguistically quantified statement 4074
- Link addition 5700
- Link-based ranking algorithm 10066
 HITS 10065
 PageRank 10065
- Link deletion 5700
- Link number 3810
- Link popularity 5271
- Link rules 8819, 8841
 couplers 8819, 8828
 decouplers 8819, 8828
 outer-totalistic 8818
 restricted totalistic 8819
 substitution rules 8847
 totalistic 8818
- Link spam 5271
- Link-spamming 5266
- Link strength 2729
- Link tracing 8214
- Linkage 735
- Linking 3135
- Links 724, 727, 1600, 7111
- Links-nodes-blobs model 1449
- Lin's context based reasoning method 4314
- Lin's method 5303
- Linux cluster 5758, 5777
- Liouville dynamics 4381
- Liouville equation 997, 1003, 1621, 4381, 7810
 finite-difference Liouville's equation of motion 1622
- Liouville–Jacobi formula 6430
- Liouville operator 1621, 4588
- Liouville quasioperator 1619
- Liouville theorem 4588, 5453, 6433
- Lippmann–Schwinger equation 6741
- Lipschitz continuous function 3256, 4543, 4545, 4552
- Liquid 5929, 6955, 9874
 constitutive equation 5929
 non-Newtonian 5931
 Oseen fundamental tensor 5939
 planar motions 5930
 pure shear flow 5930
 steady bifurcation 5935
 three-dimensional flow 5939
 two-dimensional flow 5930, 5941
- Liquid crystal model 5241
- Liquid like regions
 critical point 3792
- Liquid-solid transition
 polymer physics 6818
- Liquidity 5408
 customer effectively demands instantaneous liquidity 5423
 overnight liquidity 5423
- Liquidity traders 5398, 5412, *see also* Uninformed traders
- Listeria 1744, 1745, 1753–1757, 1766, 1768, 1769, 1771–1773
- Literacy 2321
 coupled oscillators 2312
 knowledge 2316
 rhythm pattern 2311
 words 2311
 writing 2316
- Lithosphere 4179, 7918

- Lithosphere-atmosphere-ionosphere (LAI) coupling 2623, 2628, 2630–2632
- Litigation 1846
- Littlewood’s conjecture 3106
- Living things 1538, 1552
- LLLE 7997
- Lloyd Warner, W. 8267
- LLS model 96
- LMF *see* Lower membership function
- Load balancing 7906
agent-based modeling 154
- Loading rate 7030
- Local bifurcation 2263, 4523
- Local control center 2400
- Local-dissipation theory, Rouse 6812
- Local drag, single chain dynamics 6820
- Local earthquake 7915
- Local earthquake magnitude methods 2665
- Local entropy 967
- Local equilibrium 994
- Local ergodicity 961
- Local field 8588
- Local frequency 8588
- Local function 7680
- Local geometry in amorphous computing 265, 267
- Local GrC model, first GrC model 4344
- Local hamiltonian problem 7186
- Local interaction 3197–3199
- Local intermittency measure, LIM 8535
- Local largest Lyapunov exponents 7997, 7998
- Local limit theorem 965
- Local linear estimator 3511
- Local majority voting 3235
- Local majority voting rule 3235
- Local minimum 1818
- Local modification, agent actions 188
- Local network 8292, 8295
- Local point of view, agent interaction 193
- Local product structure 4729
- Local rigidity 3096
- Local rule 9250
- Local site effects 4440
- Local social neighborhood 8323
- Local stability model 7042
- Local structure, network 507
- Local travel times, computation of bending methods 9185
- finite-difference approximation 9185
- Huygens’s principle 9185
- pseudo-bending method 9185
- shooting method 9185
- shortest-path method 9186
- Local uniqueness of invariant manifolds 945
- Local unstable manifold 4729
- Local update function 165
- Local vertex invariant 2201
- Local well posedness 2040
- Locality 8709, 8724
- Locality property 8724
- Localization 4921, 6071
- Localization length 2256
- Localized coefficients 6715, 6717
- Localized electronic excitations 8592
- Localized SP 9364
- Locally compact groups, unitary representations 3079
- Locally free actions 5486
- Locally minimizing solution, *n*-body 5978
- Locally stationary 8676
- Location 2396, 5428
- Lock-in 4640
- Locke 1883
- Locked inertia tensor 5503
- Lockstep 8696
- Loeb construction, non-standard stochastic analysis 6306
- Loeb measure theorem 6306
- Loewner equation 8709, 8719–8721
- Loewner evolution 3729, 8709, 8720, 8722
- Log fitness, network 505
- Logarithmic correction 5027, 5028
- Logarithmic type potentials, *n*-body problem 5981
- Logarithmic waiting times 7586
- Logic 7850
of chemical systems 330
possibilistic 6927
- Logic circuit, quantum computation 7378
- Logic gates 2090
- Logic operation, artificial chemistry 331
- Logical circuit 9705

- Logical constructions
symbols 6302
- Logical control of computations 5477
- Logical incrementalism 7840
- Logical Kronecker symbol 7448
- Logical mobility of programs 5608
- Logical neuro-fuzzy system, architecture 6093
- Logical quantum bit, error correction 7243
- Logical systems 6088
- Logical-type neuro-fuzzy systems 6089
- Logically universal 7689, 7702
logically universal 7698
- Logistic curve 4921
- Logistic function 1817, 8307
- Logistic growth 1054, 4921
- Logistic map 370, 406, 3506
dynamic fractals 3793
- Logistic regression 2569, 6004
- Lognormal distribution 1050, 1051
- Logons 3352
- $\log(t)$ 5025
- Loma Prieta 9201
- Long chain branched" (LCB) melt 6822
- Long period 6956
- Long-range correlations 3758, 6574
biological fractals 3791
- Long-range elastic stress transfer 5025
- Long-range interactions 4610, 4613
long distance trade 4625
maritime trade 4625
- Long-range memory effect 1626
- Long-range negative feedback 562
- Long-run effects 7053
- Long-term 1888, 1906
- Long-term correlations 3764
- Long-term evolution 7994
- Long-term memory 3712, 3713, 3716
- Long-term processes 1875
- Long-term traffic prediction 9514
- Long-time behavior, Navier–Stokes 5953
- Long valley caldera 2605, 2610, 2613, 2617, 9868
- Long-wave approximation 9604
- Long wavelength parameter 9984
- Longevity 2084, 3208
- Longitudinal and transverse modes 9924
- Longitudinal methods 8276
- Longitudinal mode 6124
- Longitudinal velocity increment, stochastic processes 3590
- Lookup table (LUT) 871, 3233, 3234
transition function 3233
- Loop 4487, 4493, 6029, 8246
- Loop contribution 8952
- Loop eigenvalue Elasticity analysis (LEEA) 8948, 8949
- Loop erased random walk (LERW) 8709, 8713, 8714, 8722, 8724
- Loosely Bernoulli transformation 4991
- LOQC 7257, 7258
- Lord-of-the-Rings trilogy 1339
- Lorentz gas 1001, 1002, 1005, 1006, 1009
- Lorentzian lineshape 6123
- Lorenz
core 1667
dominates 1666
order 1666
- Lorenz attractor 8645
- Lorenz curve 2801, 2814
- Lorenz equation 8645
stochastic 3586
- Lorenz–Haken equations 6133, 6172
- Lorenz-like strange attractor 4734
- Lorenz, Edward N. 6132
- Lorenz's equations 6132
- Lorrain, François 8268
- Loschmidt echo 7170
- Losonczi's means 229
- Loss (cost) function 3475
- Loss function 3479, 3491, 3493–3498, 3500
- Lotka–Volterra model 3362, 3363, 3366, 3369
- Louis Michel 6187
- Love or Rayleigh wave 2615
- Love wave 2611
- Lovelace 5477
- Low density limit 7808, 7809, 7819
- Low density regions, critical point 3792
- Low-dimensional dynamical systems 3022
- Low-dimensional semiconductor nanostructures 5912
- Low dimensionality 8544
- Low molecule numbers 555
- Low-pass filter 592, 595
- Lower and upper solutions 6619–6621

Lower approximation 4425, 7776, 7787, 7800
 concept lower approximation 7802
 singleton lower approximation 7802
 subset lower approximation 7802
 Lower dimensional tori 5068, 5082
 Lower membership function (LMF) 4013
 Löwner equation 7025
 Löwner, Karl 8710
 Lowry model 1062
 ls-set 8288
 Lubrication approximation 3633
 Lubrication limit 5583
 Lucas critique 205, 207, 218, 5330
 Ludgate 5476
 Luenberger observer 6374
 Łukasiewicz *s*-norm 4067
 Łukasiewicz *t*-norm 4067
 Lumen 532
 Lumping 4604
 Lundgren hierarchy 3649
 Lundgren spiral 3646
 Lung
 biological fractals 3783
 diseased 3784
 Lusternik–Schnirelmann category 6622
 LUT 3234, 3238
 Luttinger liquid 9680
 LW *see also* APS operator
 Lyapunov exponent 953, 989, 992, 998, 1001, 1003, 1006, 1007, 2862, 3023, 7169, 7608, 8912, 9251
 global 3506
 local 3506, 3514
 Lyapunov function 51, 6272, 6273, 6280, 8639, 9225, 9231
 converse theorems 4682
 patchy control 4686
 semiconcave 6281, 6283
 strict 9227
 Lyapunov functional 5242
 Lyapunov-like index 3517
 Lyapunov–Schmidt method 5300
 Lyapunov spectrum 3025, 3507
 Lyapunov's equation 8640
 Lyapunov's theorem 8640
 Lévi-Strauss, Claude 9411

M

M-Wavelet frame 590
 M8 series 2569
 MAC *see* Message authentication codes
 Mach number 26
 Mach reflection 8489
 Mach stem 8489
 Machì A 780, 784
 Machine cognition 1111
 Machine intelligence, human-competitive 4138
 Machine learning (ML) 1303, 1827, 2161, 4403, 4739, 4777
 Machine perspective 1542
 Macro 1543
 Macro element 5800
 Macro-level 8185
 Macro-micro-macro questions 6008
 Macro-operator 5190, 5199
 Macrocosm 7849, 7850
 Macromolecule 6014, 6016, 6020
 Macrophage 9098
 Macroscale 1399
 Macroscopic level 5733
 Macroscopic modeling 9446
 Macroscopic variable 2678, 7993
 Macrostate 4378, 4380
 polymer physics 6813
 MACSYMA 6633
 Madhavan, Richardson and Roomans model 5402
 Maeda 3564
 MAFIA 5061
 Magic word 9253
 Magma 2616, 6955, 9785, 9873
 Magma chamber 6956, 6965, 9764, 9766, 9770, 9776
 Magma discharge rate 9773
 Magma extrusion 9777
 Magma intrusion, subsurface intrusion 9870
 Magmatic and hydrothermal fluids 9900
 Magnet 5022
 polymer physics 6815
 Magnetic bubbles 2025
 Magnetic field 22, 3825
 fluctuation, quantum computing 7238
 Magnetic helicity 9269
 Magnetic length 8586

- Magnetic moment 7343
 Magnetic ordering 7355
 Magnetic permeability 1399
 Magnetic reconfiguration 8529
 Magnetic reconnection 37
 Magnetic resonance 8594
 Magnetic spectroscopy 7350
 Magnetic term 5491
 bundle reduction 5499
 Magnetically diluted solid 8594
 Magnetism 7823
 Magnetization 3850
 Magnetoencephalogram (MEG) 1627
 Magnetoencephalography (MEG) 1436
 Magnetohydrodynamic (MHD) equations 8523
 Magnetohydrodynamics (MHD) 6721, 8010,
 8526, 9272
 reduced magnetohydrodynamics 8013
 Magnetosphere 21
 Magnification curve 2475, 2480
 Magnification, static 2477
 Magnitude 2396, 2474–2476, 2481, 3765, 9594
 automatically determined 2491
 band-limited 2482
 broadband 2482
 earthquake 2664
 hawaii earthquake 2665
 local 2396, 2475, 2477, 2479
 local earthquake 2665
 rapid 2478
 Richter 2396
 series 3765
 teleseismic 2491
 traditional amplitude based 2665
 Magnitude determination
 automatic 2494
 real-time 2494
 Magnitude discrepancy 9580
 Magnitude saturation 2484, 2486, 2487
 Magnitude scale 2476, 2477, 2484
 Magnitude units 2477
 Maharam extension, ergodic theory 3065
 Majercik 8829–8831
 Major features: phase transition, volatility and
 predictability 5593
 Major histocompatibility complex (MHC) 2121,
 2146, 2191
 Majorana 6805
 Majoritarian voting 9947
 Majority action cellular automaton 782
 Majority-choice approval 9954
 Majority logic 9722
 Majority relation 9943
 strict 9943, 9949
 Majority rule 872
 Majority vote 9935, 9938
 Majority voting 9935
 Majorizing series 6764
 Malaria, effects of climate change 1101
 Malicious hosts 5611
 Malicious mobile agents 5610
 Malthus–Verhulst model 15
 Malthus, Robert 3793
 Malthusian effects of resource scarcity 4623, 4626
 Malware propagation 4369
 Mamdani approach, fuzzy inference reasoning
 6088
 Mamdani model 4708, 4882
 Mamdani system 4882
 Mamdani-type neuro-fuzzy systems 6090
 Man-made structure 2421
 Management exercises 7059
 Management flight simulator 1980, 9050
 Management laboratory 1980
 Management science 9015
 Managerial practice field 9050
 Manakov (system) 1376
 Mandelbrot–Given fractal 3705, 3880, 3891
 Mandelbrot set 3706, 3841
 Mañé 969
 Manifold 1129, 1131, 1135, 5440
 contact 1135
 differentiable 6600
 driven 1131
 elastic 1126, 1129
 Hilbert 6600
 Poisson 6598
 Riemannian 6600
 Riemannian manifolds 5440
 symplectic 6587–6589, 6597, 6603
 tangent and cotangent spaces 5440
 Manipulation 3331, 9960
 Manna model 645
 Manning condensation, polymer physics 6817

- Mantle magnitude 2483
 Mantle magnitude (M_m) method
 tsunami warning 2667
 Mantle surface-wave data 2488
 Manufacturing 1970
 Many-body effect 8577, 8578
 Many-body problem 7313
 Many-chain fluid, polymer physics 6817
 Many particle physics, stochastic processes 3587
 Many-particle problems 7346
 Many-spin clusters 8595
 Many-valued implication 6936
 Map 3034, 3036
 Gauss map 3030, 3032
 momentum 5484
 nondegenerate 3034, 3036
 of science 1258
 Poincaré 6592
 Poincaré 6593
 Maple 8848
 Mapping 4677
 locally bounded 4677
 outer semicontinuous 4677
 regularization 4679
 set-valued 4672
 structure-to-function 330
 Mapping rules, DNA 3796
 Mapping site 65, 67
 Marakhovsky 3547
 Marangoni effect 3620
 Marchal's P_{12} -symmetry 5968
 Marchenko integral equation 4968, 4969
 Marchenko kernel 4968, 4969
 Marchenko method 4968, 4969
 Marcovian stochastic process 9291
 Marginal 8952
 Marginal cost pricing 1675
 Marginal distribution 1866
 Marginal factor cost 2285
 Marginal likelihood 446, 449, 452
 Marginal pricing rule 1675
 Marginal rate of substitution 1678
 Marginal revenue product 2285
 Marginal stability 32, 7583, 7587
 Margolus partitioning 7161
 generalized 7159
 Margolus partitioning scheme 7157
 Mark and destroy 2097
 Marker propagation for amorphous particles 260
 Market 3385, 6783, 9566–9575
 micro-structure 3385
 order-driven 3386
 secondary 9565, 9567, 9568, 9574
 US treasury 9566, 9568
 Market anomalies 92, 3457, 3458
 daylight saving effect 3472
 daylight-saving effect 3458
 January effect 3458, 3469
 Monday effect 3469
 mondays effect 3458
 risk-free rate puzzle 3467
 SAD effect 3458, 3470, 3472
 turn of the month effect 3469
 Market beta 3391
 Market capitalization 3391
 Market economy 2285, 2804
 Market entry 1962
 Market games 4097
 Market inefficiency 3449
 Market maker 3380, 5398
 Market microstructure 5392
 Copeland and Galai's model 5397
 Easley and O'Hara's model 5398
 empirical 5401
 Garman's model 5396
 Hasbrouck measure 5401
 information-based models 5397
 inventory models 5395
 Kyle model 5400
 Madhavan, Richardson and Roomans model 5402
 Market order 5433
 Market power hypothesis 5432
 Market saturation 681
 Market share 1965, 1978
 Marketing 5377–5384, 5386, 5388, 5390, 9042
 Markov analysis 3658
 Markov approximation 4908, 7915
 Markov chain 167, 2745, 2747, 2749, 5670, 5999,
 6000, 6840, 8276, 8768, 9849
 finite alphabet 6950
 maximum likelihood 9849

- Markov chain Monte Carlo 450, 1231, 6995
 Gibbs sampler 1231
 metropolis–hastings 1231
- Markov condition 6995
- Markov decision problems 8699
- Markov–Einstein coherence 3656
- Markov graphs 8215
- Markov hypothesis 8937
- Markov map, uniformly expanding 6950
- Markov models 3457, 3459
 additive markov gordon model 3459
 geometric markov gordon model 3459
- Markov odometers 3060
- Markov operator on a group 787
- Markov partition 4730, 6941, 8891
- Markov–perfect equilibrium 2228
- Markov perfect equilibrium (MPE) 2218
- Markov process 644, 2817, 2941, 5244, 5456, 8767, 9839
 Chapman–Kolmogorov equation 8767
 stochastic processes 3579
- Markov property 8709, 8713, 8716, 8718, 8721–8724, 8728
 stochastic cascade process 3592
- Markov random graph model 8322, 8324, 8326, 8329
- Markov shift 953, 4984, 5456
 isomorphism theory 4992
- Markov switching 3424, 3443
- Markov switching autoregressive model 449
- Markov switching model 2745–2748, 2750, 2752, 2754, 5326, 5333, 5334, 5336, 5337, 5339–5341, 5344, 5418
 Bounceback model 5335, 5336, 5340, 5343
- Markovian 5223
- Markovian game 2216
- Markovian properties
 direct evolution 3582
 joint probability distribution 3580
 stochastic time series analysis 3582
- Markovian splitting subspace 8757
 minimal 8759
- Markovian strategy 2217
 pure stationary 2223
- Markowitz portfolio theory 4973
- Marsupial mechanisms 2079
- Marsupial pair 2082
- Marsupial teams 2077, 2087
- Martin–Löf tests 247
- Martingale 3475, 3476, 3478, 3480, 3481, 3495, 5253
 Martingale difference 3438
 Martingale of a posteriori 7634
- Marxist city 7961
- Marxist economic theory 2285
- Marxist system 2285
- MAS *see* Multi-agent systems
- Mask 592
- Mass-action kinetics 329, 556
- Mass advection 9906
- Mass conservation 5535, 5536
- Mass density 5026
- Mass diffusion 6961
- Mass fraction 611
- Mass media 8308
- Massive software system 1339
- Massively multi-agent systems (MMAS) 149
- Massively multi-player online games 1341
- Massively parallel computing 259
- Massively parallel processors 9723
- Massless fermion 8577, 8585
- Master equation 3361, 3365, 3368, 3581, 5671, 6139, 6140, 6164, 8386, 8589, 8769, 8933, 9291, 9292
- Master stability function 8912
- Matching 2839, 6988, 7607, 9655
 F-optimal stable matching 9656
 pareto-optimal matching 9656
- Matching law 1886
- Matching mechanism
 manipulable mechanism 9656
 revelation mechanism 9656
 stable matching mechanism 9656
- Matching methods 5561
 ATET 5561
- Matching technology 4110
- MATCONT 6349
- Mate-In-N 4142
- Material flows in ecosystems 2703
- Material points, fluid 5928
- Material surfaces, fluid 5928
- Material unaccounted for 4860
- Material volumes, fluid 5928
- Materials, smart nanoscale self-assembled 1304

- Maternal effects 1926
 Mathematica 119, 8848
 Mathematical biology 1227
 Mathematical chemistry 6852
 Mathematical discussion 6302
 Mathematical extension, definition 6289
 Mathematical finance 6231
 Mathematical framework 160
 Mathematical model 3694, 3696, 4783, 6792
 - macroscopic 3694
 - microscopic 3694
 Mathematical modeling 3114, 3683, 3691, 3694
 - Eigen plane 3115
 Mathematical physics, and mechanical systems 5488
 Mathematical structure 6797
 Mathematical system 6301
 - definition 6289
 Mathematical table 5476
 Mather 704
 Mathieu equation 2325, 3618, 6626, 6628–6630, 6633
 Matrix 2203, 9188
 - adjacency 2201
 - aperiodic 6243
 - condition number 9188
 - distance 2201
 - fully indecomposable 6244
 - irreducible 6239
 - monodromy 6593
 - Moore–Penrose generalized inverse 9188
 - nearly reducible 6244
 - nonnegative 6242
 - null space 9188
 - partly decomposable 6244
 - positive 6242
 - primitive 6242
 - quantum mechanics 7371
 - reducible 6239
 - strongly connected digraph 6239
 - symmetric 6241
 - symplectic 6589, 6590
 Matrix action 4985
 Matrix diagonalization 8592
 Matrix display 8248
 Matrix element of Liouville’s quasioperator 1623
 Matrix element of the contracted description 1620
 Matrix extension problem 595, 598
 Matrix-matrix multiplication 6392
 Matrix-multiplication chemistry 332
 Matrix pencil 8620
 Matrix reordering 8604
 Matrix subshift 8906
 Matrix-tree theorem 6250
 Matrix-vector algebra 6393
 Matrix-vector multiplier 6392, 6393
 Matrix zoom 1258
 MatrixExplorer 1258
 Matter energy density 3274
 Matter Era 3274
 Matthew effect 6004
 Maturation 2854
 Mature localized fault 5035
 Maurer–Cartan equations 5506
 Max-cut problem 6420
 Max-min composition of two fuzzy relations 4068
 Maximal clique 2097
 Maximal entropy measure 6949
 - for cellular automata 2984
 Maximal inequality 2936
 Maximal KAM tori 5067
 Maximin piece 3328
 Maximin procedure 9951, 9956, 9960
 Maximin strategy 3328
 Maximizing decision 4076
 Maximum 4067
 Maximum a posteriori estimator 9193
 Maximum entropy formalism 2903
 Maximum entropy measure 953
 Maximum entropy measures, existence of 961
 Maximum entropy principle 728, 4897
 Maximum flow problem 6415, 6417
 Maximum likelihood 6006, 6007, 9034
 Maximum likelihood estimates 2749, 2752
 Maximum likelihood estimation 2748, 7016, 9036
 Maximum likelihood estimator 9037
 Maximum nonlinear response 2427
 Maximum principle 1028, 5445, 6271, 6272, 6275, 6276, 9105
 - abnormal 5445
 - extremals 5445
 - normal 5445
 - Pontryagin 6276
 Maximum spectral type 5464

- Maximum transient lengths 72
 Maxwell–Bloch equations 6133, 6167
 Maxwell–Boltzmann distribution function 8936
 Maxwell counting 2830, 6014, 6016, 6017
 Maxwell distribution 4909
 Maxwell equations 6121, 9272
 MAYA-II automaton 5649, 5650, 5652, 5653
 Mayer, Gottfried 8943
 Mayo, Elton 8267
 Mazoyer 3539, 3542
 McCarthy, J. 3539
 McCell 8743
 McGehee coordinates, dissipation 5980
 McKendrick 6779
 MCMC 8784
 MD *see* Molecular dynamics
 Mealy machine 4106
 Mean
 of maxima method 4884
 period 635
 phase 631
 Mean anomaly 6676
 Mean cluster size 1403, 6541
 Mean coordination number, stochastic network 4955
 Mean curvature flow 6219, 6221
 Mean dimension 781, 786
 Mean ergodic theorems 3058
 Mean field 634, 636, 638, 1133, 4906, 5025, 6807, 7823
 approaches 3364
 approximations 3362, 6772
 methods 8046
 power laws 3369
 theories 3362
 theory 5021, 5027
 Mean free path 7917
 Mean intervertex distance 4488
 Mean moment rate profile 5030
 Mean path length 725
 Mean reversion 98
 Mean square displacement 3888, 5219, 8712
 Mean square error 8672
 Mean square forecast error (MSFE) 3505
 Mean time delay 9296
 Meaning postulate, fuzzy logic 4000
 Measurability 4050
 Measurable 3054
 Measurable dynamical systems
 isomorphism 5041
 Measurable dynamics of cellular automata 3002
 mixing and ergodicity 3002
 spectral properties 3003
 Measurable functions, definition 6307
 Measurable map 5463
 Measure 1014, 2239, 2981, 3033, 3034, 3054, 3879, 5454, 6306, 8710, 8713, 8716, 8718, 8721
 absolutely friendly 3034
 Bernoulli measure 2981
 cylinder set 2981
 ergodic theory 6944
 extremal 3033, 3035
 Federer 3034
 friendly 3034
 full support 2982
 μ -preserving 2982
 Φ -invariant 2982
 Rajchman 8565
 spectral 8556
 spectral, of the process 8565
 strongly extremal measure 3035
 support 2982
 Measure algebra 5461
 Measure algebra endomorphism 5452
 Measure-preserving dynamical system 2982, 5039
 commutant 5044
 empirical distribution 5047
 Gaussian dynamical systems 5049
 K-system 5040
 Krieger’s finite generator theorem 5047
 mixing 5045
 multifold mixing 5048
 Ornstein’s isomorphism theorem 5047
 pointwise convergence 5047
 Poisson suspension 5049
 rank-one transformations 5044
 spectral types 5041
 weak mixing 5040
 Measure-preserving map 3054
 Measure-preserving system 5452
 Measure-preserving transformation 4984
 Measure rigidity 3096
 of cellular automata 2988
 Measure space 3054

- Measure-theoretic entropy 4986
 Measure-theoretically isomorphic 2921
 Measured-mile approach 1847
 Measurement scale 1682, 1988
 Measurement (theory) 1879
 Measures of effectiveness 9457
 Measures of maximum entropy 958
 Mechanical and analogue computers 9705
 Mechanical artificial chemistry 336
 Mechanical automaton 5477
 Mechanical circuit 7032
 Mechanical clamp 7036
 Mechanical computing 5467
 Mechanical computing device 5473
 Mechanical connection 5493, 5495, 5503
 extremal characterization 5504
 Mechanical failure
 bulk modulus 5002
 shear 5002
 shear modulus 5002
 unjamming 5002
 Mechanical folding 7046
 Mechanical forces 7027
 Mechanical inference machine 5477
 Mechanical proteins 7029
 Mechanical stability 7033
 Mechanical systems 5482
 and mathematical physics 5488
 discrete 5498
 nonholonomic 5498
 Mechanical unfoldases 7042
 Mechanics
 gauge theory 5495
 geometric 5483
 stochastic 3871
 Mechanism 4788, 4790, 5467, 5510, 5514,
 9070–9073
 direct 1672
 indirect 1672
 integer game 4797
 straightforward 1672
 strategy-proof 1673
 Mechanism design 4096, 6978
 Mechanism of aquatic toxicity (MOA) 2127, 2148
 Mechanism of pre-seismic EM phenomena 2629
 Mechanism of toxic action 2129
 Mechanistic QSAR 7077
 Mechanochemical enzymes 7042
 Media 3128, 3133
 Media campaign 8315
 Median 227, 229
 Median rule 227
 Median voter theorem 9937
 Mediated communication 1592
 Medical innovation study 8311
 Medical malpractice 7052
 Mediotype 3209
 Mediterranean Sea 7842
 Medium resolution imaging spectrometer 1701
 Mega-wide moving jam 9392
 Melnikov conditions 5082
 Melnikov theory 6637
 Melt 6955, 9887
 Melt segregation 2685
 Melt viscosity
 entangled polymer dynamics 6822
 polymer physics 6813
 Melting 2026
 Melting temperature 2170
 Membership function 4061, 4062, 4877, 8681
 fuzzy logic 3991
 secondary 4089
 type-2 fuzzy logic 4010
 Membership grade 4062
 fuzzy logic 4010
 Membership values
 discrete 4090
 special fuzzy function 4085
 Membrane 691, 6101
 Membrane computing 928
 in artificial chemistry 341
 Membrane fusion 9751
 Membrane permeability 859
 Membrane structure 5524
 Meme 126, 3205, 3206
 fitness 3212
 parasitic 3216
 Meme replication 3211
 Memeplexes 3210
 Memes vs. genes 3208
 Memetics 3205
 Memory 1120, 6099, 6106, 6111, 6112, 7024
 episodic 1120
 long-term 1120

- semantic 1120
- short-term 1120
- strong fluctuations 7024
- working memory 1120
- Memory effect, statistical 1624
- Memory function 1616
- Memory in other discrete time contexts 843
- Memory organization packets 1804
- Memotype 3209
- Menarche 1905
- Mendeleyev conjecture 7424
- Mental disorders 627, 7992
- Mental health diagnosis, modeling 4573
- Mental model alignment 7063
- Mental models 7057, 7841, 7850, 9048, 9060, 9062
- Mere exposure effect 2244
- Mereology 4419, 7789
- Merge bottleneck 9374
- Merging 7658, 7660, 9398
- Mertens and Zamir system 7641
- Merton jump-diffusion model, quadratic return variation 8787
- Mesenchymal 532
- Mesh partitioning 7906
- Meso 1543
- Meso-scale assembly 5479
- MesoRD 8741
- Mesoscale 1399
- Mesoscopic description of a graph 1160
- Mesoscopic level 5733
- Mesoscopic modeling 9447
- Mesoscopic physics 7663
- Message authentication codes (MAC) 5612
- Message-passing interface (MPI) 155
- Meta-dynamical ODE frame work 332
- Meta-model 216, 5320
- Meta-modules 5627
- Meta rules 8187
- Meta-stability 2421
- Metabolic control analysis 559
- Metabolic network 504
- Metabolic rates 3281
 - fractal 3784
- Metabolic reaction networks 5656
- Metabolic scaling 2708
- Metabolic stability 2186
- Metabolic systems biology 9104
- Metabolism 5537, 5539, 9104
- Metabolites 9104
- Metabolomic 5537
- Metacognition 2243
- Metacommunity 2706
- Metadata 355, 8084
- Metaethnic frontier 4615
- Metapopulation 2723
 - dispersing organisms 2737
- Metastability 1438, 1538, 1549, 1551, 2023, 4497, 4505
 - symmetry breaking 1549
- Metastable régime 1550
- Metastable state qubit 7224
- Metastable states 2022, 2035
- Metastable synchronized flow 9361
- Meter 2310
- Methane 1078, 1322
 - selective dehydrogenation 1322
- Method of moments 3457, 5999, 6006, 6007
- Method of simulated moments 217, 3457, 3464
- Methodological individualism 207
- Methodology 9003, 9004, 9012
- Metric
 - fractal 3870
 - Jacobi 6604
 - Riemannian 6605
- Metric factor 6998
- Metric multidimensional scaling (MDS) 8283
- Metropolis 6784
- Metropolis–Hastings algorithm 6003, 8325
- Mexican hat function 3346
- Mexico 2397
- Meyer's wavelets 10033
- Mezey's molecular hologram 2209
- MI *see* Mutual information
- Micelle 859
- Michael Conrad 924
- Micro 1543
- Micro-electro-mechanical system (MEMS) 5478
- Micro-level 8185
- Micro-macro interaction 8406
- Micro-simulator 163
- Microanalytical simulation 8406, 8410
- Microarray 721, 3968
- Microbial camera 425
- Microbial colony language (MCL) 260, 267

- Microbial fuel cell (MFC) 3690
 Microbiology, amorphous computing 258
 Microcanonical ensemble 1270
 Microcosm 7850
 Microearthquakes 2543
 velocity pulses 2546, 2547
 Microenvironment, breast cancer 919
 Microfabrication, amorphous computer 258
 Microfeature 3334
 Microfoundations 5431
 Microlevel simulation 8375
 Microlite 9764, 9775
 Microlocal analysis 1494
 Micromotion, quantum computing 7222
 Micron 5573
 Microprocessors 7401
 MicroRNAs (miRNAs) 1203
 Microscale 1399
 Microscopic modeling 9447
 Microscopic simulation 92, 6478
 Microscopic state, quantum information processing 7364
 Microscopic structures of GPs 9397
 Microscopic variable 2678
 Microsoft robotics studio 2079
 Microstate 4380
 polymer physics 6813
 Microstructure 1396, 3390, 9565, 9570, 9573, 9575
 periodic 1396
 random 1396
 US treasury market 9573
 Microtrap, quantum computing 7223
 Microtubule 1744, 1746–1748, 1750–1755, 1759, 1761, 1762, 1766, 1768–1774
 Microworld 4583, 9044, 9050
 Mid-Pleistocene transition 4
 Middleware 1349, 5762
 Midrange 227
 Migdall 7263
 Mignosi F 780
 Migration 6450
 climate change 1102
 Milburn 7258
 Mild solution 1488, 6234
 Milestones 1902
 Milgram experiment 8263
 Milgram, Stanley 8269, 8277
 Military 7061
 Military intervention 7843
 Turkish 7845
 Miller indices 1310
 Miller's solution 9952
 Millionaire calculator 5476
 MIMD *see* Multiple instruction multiple data
 MIMO *see* Multi-input multi-output
 Min max payoff 7618, 7628
 Mind 1550
 endomorphic modeling and simulation of 363
 Mind–body problem 4893
 Mind-body problem 121
 Mind viruses 3206
 Miniaturization 2091
 quantum information processing 7362
 Minicluster of genes 1183
 Minimal action principle 9413
 Minimal covering set 9953, 9958
 Minimal rational extension 8763
 Minimal realizations 6375
 Minimal self joining transformation 4989
 Minimal system 9234
 observability 6373
 Minimal time problem 6278, 6283
 Minimax procedure 9952, 9956
 Minimization algorithm 819
 Minimizer
 n-body problem 5967
 planar equivariant 5968
 three-dimensional equivariant 5968
 Minimum 4067
 Minimum-cost-flow-problem 6411
 Minimum cost spanning tree games 1664
 Minimum cut problem 6415
 Minimum-energy-path 1312
 Minimum level, observability 6378
 Minimum output entropy additivity conjecture 7393
 Minimum-phase 9089
 Minimum spanning tree algorithm 5054
 Minimum spanning trees 6501
 Minimum support value and membership functions 4154
 Mining data streams 3252
 Minkowski norm 7429
 Minor 8956

Minority-carrier transport 9714
 Minority game (MG) 4979, 5591, 6808, 7627
 no strategy table and no information 5601
 without information 5590, 5601
 Minsky, M. 3539
 MIP 7193
 Mirror neuron 1898, 1904, 8205
 Mirror system (HMS) 8205
 MISO *see* Multi-input single output
 Missed alarm 2417
 Missing attribute values 7798, 7801
 conditions 7798
 do not care 7798
 lost values 7798
 Missing values 1841
 Mitchell, Clyde 8268
 Mitigation 1076, 3110, 3131, 9033
 disaster mitigation 3113
 Mitochondria, membrane potential 477
 Mitochondrion 5547
 Mittag–Leffler function 5222
 Mixed behavior 2835
 Mixed phase space 992
 Mixed state 2869
 Mixed strategies 4855, 8653
 Mixed systems 1008
 Mixed transition 2831
 Mixing 385, 2531, 2533, 2535, 2925, 3049, 3647, 4589
 assortative 2531, 2536
 disassortative 2531, 2536
 higer order 2929
 mild-mixing 2928
 strong-mixing 2926
 weak-mixing 2925
 Mixing recurrence, ergodic theory 3061
 Mixing system 402, 990, 993, 994, 9248
 weak mixing 996
 Mixture modeling 457
 Mixture-of-distributions hypothesis 8784
 Mixture of experts models 5323
 Miyagi-Oki earthquake, tsunami 4846
 MLEM2 algorithm 7802
 mm-precisiand, fuzzy logic 3997
 MMAS *see* Massively multi-agent systems

Mobile agent systems
 properties 5613
 survey of 5613
 Mobile agents 5604
 agile computing 5615
 application areas 5613
 attacks on 5610
 classification of 5605
 components of 5609
 definition 5607, 5608
 denial of service 5611
 distributed systems 5615
 dynamic configuration 5609
 endogenous threats 5610
 exogenous threats 5610
 global state of programming 5608
 localities 5608
 malicious 5610
 orthogonal capabilities of 5605
 requirements 5608
 restricted connectivity 5608
 security 5609
 unmanned autonomous systems 5615
 Mobile code 5606
 Mobile computing 5605
 theoretical foundations 5608
 Mobile docking station 2085
 Mobile search 5282
 Mobile state 5606
 Mobile systems, classification of 5607
 Mobility 7402, 9412
 Modal analysis 2324
 Modal logic
 alethic 8340
 Graded 8341
 hybrid logics 8342
 propositional 8341
 propositional multi-modal 8341
 Modality, networks 1182
 Mode 7663, 8040, 8280
 mode competition 6124
 of toxic action 2166
 quantum computing 7231
 1-Mode 8281
 2-Mode 8280
 Mode-coupling 3371
 theory of the glass transition 4225

- Mode-locking 6136
 Mode skeleton 8936
 Mode-space NEGF 7484
 Mode-switching 5027, 5033, 5035
 Model 289, 2285, 2441, 4392, 5743, 6104, 6412, 6772, 7088–7090
 Aw-Rascle 9733
 black box 7088
 black-box 7091
 Blue–Adler 3159
 bottom up 8186
 Colombo 9734
 continuous 7090
 continuous time 7107
 De Angelis 9732
 Delitala and Tosin 9739
 discrete 7090
 discrete velocity 9739
 Enskog-like 9738
 fictitious density 9732
 first order 9729
 fluid-dynamic 3156
 fracture networks 6506
 Fukui–Ishibashi 3159
 gas kinetic 3156
 Gipps–Marksjöös 3159
 GPS measurements 2577
 Klar and coworkers 9738
 lattice Boltzmann (LB) model 870
 lattice-gas 3161
 learning from 8193
 Lighthill–Whitham–Richards 9730
 LWR 9730
 manna 651
 mathematical 9727
 measurement based 7114
 of biological networks 724
 optimal-velocity 3161
 Paveri Fontana 9737
 Payne–Whitham 9732
 precursor events 2577
 Prigogine 9736
 probabilistic 5743
 quantum circuit 7088
 quantum computation 7091
 rate 6100, 6106, 6109
 recursive scale-free trees 3932
 ring 6106
 second order 9730
 seismicity based 2441
 social-force 3157
 Song–Havlin–Makse 3930
 stress release model 2576
 subcritical 6106
 supercritical 6106
 Swiss cheese 3849
 top down 8186
 unobserved components model 5330
 validation 9067
 Model A critical dynamics 3371
 Model acceptability criteria 7079
 Model analysis 157
 Model-assisted estimators 8214
 Model B 3371
 Model calibration 9035
 Model fusion 5319
 Model hierarchy 5915
 Model of computation 7119
 Model of replication 3912, 3913
 Model predictive control 3944
 Model quality 9000, 9001, 9012
 Model reduction vs. loop contribution 8952
 Model selection 446, 448, 452, 5319
 Model simplification approach 8949
 Model specification 4056, 8784
 Model validation 8988
 critical importance 7076
 Model validity 8996
 Modeling 2729, 2857, 3136, 8733, 8739
 agent-based 3389
 cellular automata 1304
 deterministic 8733
 forward and inverse approaches 1220
 fuzzy logic 3997
 non-spatial stochastic 8733
 spatial stochastic 8739
 Modeling approach
 continuous 3155
 deterministic 3156
 discrete 3155
 force-based 3156
 high fidelity 3156
 low fidelity 3156
 macroscopic 3155

- microscopic 3155
rule-based 3156
stochastic 3156
- Modeling language, fuzzy logic 4005
- Modeling physical systems, applications 3240
- Modeling process 7838, 9000, 9003, 9010
antagonistic 7841
interactive 7841
- Modeling space 337
- Modeling volcanic eruptions 1223
- Modeling workflow, QSAR 7071
- Models 849, 1231, 2576, 6102, 6546–6548, 9069, 9412
evolution, fuzzy system 4080
- Moderate resolution imaging spectroradiometer 1701
- Modern linear systems theory 8954
- Modified decomposition method 83
- Modified Korteweg-de Vries (mKdV) equation 4962, 9991
- Modifiers, fuzzy logic 3988
- Modons 8494
- Modular motors, RNA polymerase 3601
- Modular network, information curve 506
- Modular proteins 7032
- Modular robot systems
ATRON 5623
CKBot 5622
M-TRAN 5623
Miche 5623
Programmable parts 5624
SUPERBOT 5623
- Modular robotic docking station 2077
- Modular self-reconfigurable 1226
- Modular structures 2732
- Modularity 730, 1144, 1145, 2716, 3934, 6049, 6054
clique 2730
groups 2730
matrix 6055
network 502
- Modularity optimization 1151
extremal 1152
greedy technique 1151
reliability 1153
simulated annealing 1152
spectral 1152
- Modulation matrix, multiwavelet 5848
- Module 730, 1973, 4835, 6178, 9096
information theory 505
regulatory 730
- Mokken, Rob 8269
- Molar parallelism 3357
- Molchan diagram 2446
- Molecular automata 924
- Molecular biology 1227
- Molecular collision 327
- Molecular complexity 498
- Molecular computing 924, 2091, 3356
- Molecular descriptor 2200, 2209
three-dimensional 2208
- Molecular dissimilarity 2209
- Molecular dynamics (MD) 2358, 6014, 6023, 6407, 6689, 7034, 7036, 8696
simulations 151, 2024
- Molecular electronics 924, 5862
- Molecular evolution, networks 1304
- Molecular finite state machines 9705
- Molecular frameworks 2838
- Molecular full adder 5646, 5647
- Molecular graph 4827
- Molecular half-adder 5646
- Molecular indicator
geometrical 2210
quantum-chemical 2210
topochemical 2210
topostructural 2210
- Molecular logic gate 5654
- Molecular machine 9750
Laing's 334
with fixed tape size 334
- Molecular media 9705
- Molecular motor proteins 1774
- Molecular motors 1738, 1739, 1741, 1747, 1757–1759, 1761, 1766–1771, 1773, 1774, 3600, 8738
DNA polymerases 3600
rotary motor 3601
- Molecular networks 5656
- Molecular similarity 2209
- Molecular structure, semi-realistic 336
- Molecular system, lattice 335
- Molecular topological descriptors, QSAR modeling 7075

- Molecular transducing automaton 5647
 Molecular weight 6547, 6549, 6550, 6553
 polymer physics 6811
 Molecule
 as building block for AC 328
 cascades 5869, 5876, 5877
 Mølmer–Sørensen gate
 quantum computing 7235, 7242
 MolNet 2152
 Moment 6145, 7000
 analysis 7001
 multiwavelet 5846
 numerics 7000
 seismic moment 2474
 Moment condition models 5559
 generalized method of moments 5560
 Moment history 2478
 Moment magnitude 2478, 2484, 2485, 2594, 2595,
 9598, 9633
 earthquake 2664
 fundamental earth's modes 2485
 Moment map 6187
 Moment measures 2574
 Moment rate 2485
 Moment-rate 2488
 Moment rate shape 5029
 Moment ratio 7004
 Moment tensor 2488, 2582, 9903
 Moments characteristic
 finite-rank 6309
 hyperfinite-rank 6309
 Momentum 98
 Momentum cocycles 5485
 Momentum mapping 2263, 4531
 Momentum maps 5484, 6597
 in symplectic reduction 5497
 nonequivariant 5485
 Momentum one-cocycle 5485
 Momentum term 1820
 Monad hyperreals 6293
 Monetary compensations 1671
 Money 2804, 2805, 2823
 distribution 2803
 supply 5416
 temperature 2805
 Monge–Ampère equation 6221
 Monitoring
 almost perfect 7621
 almost public 7622, 7627
 canonical 7622
 perfect 7621
 public 7622
 real-time 8857
 semi-standard 7623
 Monitoring structure 7621
 Monodisperse fractures 6510
 Monodisperse objects, continuum percolation 6509
 Monodromy 2263, 4516, 7136
 classical 7146
 fractional 7147
 Hamiltonian 7140
 principal 2263
 quantum 7146
 Monodromy matrix 2324, 2325, 6431, 6433
 Monofractal 3717, 3893, 3898
 Monogenic disease 2187
 Monomer 6811
 Monomer concentration 6817
 Monomeric drag constant, single chain dynamics 6820
 Monotone 8254
 Monotone hazard condition 1673
 Monotonic model 5026
 Monotonicity 4794
 Monotonous likelihood quotient property 6982
 Monte Carlo 692, 6992, 7572, 7575, 7577
 Monte-Carlo algorithm 421, 7123
 Monte-Carlo computation 4909
 Monte-Carlo dynamics 4218
 Monte-Carlo estimation 8276
 Monte-Carlo Markov chain maximum likelihood 8329
 Monte-Carlo method 7413, 7917
 Monte-Carlo simulation 2024, 3363, 3369, 3457,
 3460, 3464, 4051, 6407, 8713, 8716
 Monte-Carlo tests 6266
 Montgomery example 5449
 Mood 2242
 Moore 3547, 5473
 Moore EF 780, 783
 Moore machine 4101
 Moore neighborhood 872, 3234

- Moore's law 276, 291, 924, 3358, 7399, 7401
 first law 5861
 second law 5866
 Moral 3138
 Moral dynamics 5677
 Moral hazard 6981
 repeated 6982
 Morality 5678
 Moran model 8771
 Moran's *I* 8308
 More informative action 7624
 Moreno, Jacob 8267
 Morgenstern, Oskar 1510, 8381
 Mori–Zwanzig projections 4595
 Morphism 703, 712
 Morpho-dynamic fields 1878
 Morphogen 540, 543
 Morphogenesis 118, 423, 532, 539, 928, 3358, 8940
 Morphogenetic 532
 Morphological 2847
 Morphology 1043, 1065
 block co-polymer melt 6829
 Morphotype transition 3788
 Morrey 6664
 Morse 704
 Morse function 9227
 Morse shift 8892
 Morse theory 6622, 6623, 7138
 Mortality
 thermal stress 1098
 weather extremes 1097
 Mosaic picture 4225
 Moser 704, 5079
 MOSFET 7401, 8576, 8577
 Motif frequencies, natural 5700
 Motif information, network 507, 508
 Motif intensity score 5698
 Motif profile 10062
 Motifs 726, 1247
 and evolutionary paths 5698
 biological 5699
 FFL 5698
 in graphs 5692, 5693, 5695, 5697–5700, 6369
 of networks 5695
 undirected 507
 Motion 6427
 coordination 5783, 5790, 7725
 periodic 6587
 planning 5470
 Motivation 8001
 Motor development 1902
 Motor equivalence 5720
 Motor programs 5719
 Motor proteins 1741, 1745, 1747, 1750, 1752–1754, 1757–1760, 1764, 1766, 1769–1771, 1774
 eukaryotic 1747
 Moulin–Shenker rule 1683
 Mount Pinatubo (Philippines) 9866
 Mount St. Helens (USA) 9866
 Mountain pass solution, 3-body problem 5976, 5977
 Mountains 3700
 Movement coordination 4894, 5718, 8004, 8947
 Movement disorders 630, 641
 Movement pattern 8938
 Movement strategy 2738
 Movements disorders 627
 Moving blanks 9382
 Moving jam 9357
 emerging spontaneously 9363
 Moving quantum dot 1022
 Moving SP 9365
 Moving synchronized flow pattern 9359
 Moving traffic jam 9308
 Moyal product 6758
 MPE *see* Markov perfect equilibrium (MPE)
 MPI 5755
 MPI *see* Message-passing interface
 MQA 7189
 MRA *see* Multiresolution approximation
 MRAP *see* Most rapid approach (MRAP)
 MRJ 5014
 MS fractional fluctuation 7919
 MSFM problem 4149
 MSP 1756, 1757, 1768, 1773, 1774
 MSR-formalism 3650
 Multi-agent simulation models 150, 185, 8406
 Multi-agent systems (MAS) 161, 7534
 architeture 188
 Multi-binary GrC model, fourth GrC model 4346
 Multi-bit communication cellular automata 3555

- Multi-dimensional 8268
 Multi-dimensional feature space 2354, 2355
 Multi-dimensional scaling 2356, 8274, 8352
 Multi-dimensional space 2361
 Multi-frequency coordination 5734
 Multi-input multi-output (MIMO), type-2 fuzzy logic 4016
 Multi-input single output (MISO) 4082
 Multi-modal perception 1898
 Multi-objective optimization 9042
 Multi-phase polymeric fluid 6827
 Multi-photon ionization 7172
 Multi-planner systems 5203
 Multi-resolution 1164, 1166
 Multi-resolution analysis (MRA) 2381, 6862, 10031, 10035
 Multi-resolution approximation 6888
 multiwavelet 5845
 Multi-robot path planning 5783
 Multi-scale 2846, 2850
 Multi-scale approach spin-density-function theory 7314
 Multi-scaled phenomena 915
 Multi-target observation 5795
 Multi-wave mixing 8596
 Multibody system 2332
 Multicellular organism 929
 development 1192
 differentiation 1192
 DNA fractal features 3797
 stem cells 1192
 Multicellular tumor spheroid 917
 Multicore processor and amorphous computing 269
 Multiculturality 8394
 Multidrug resistance 2171
 reversal 2171
 Multiferroic 2021
 Multifractal analysis 3893, 3918, 9844
 dynamical systems 3024
 Multifractal behavior 3576
 Multifractal decomposition 3024
 Multifractal formalism 3895, 3897
 Multifractal model 3655
 Multifractal records 3717
 Multifractal spectra 3024, 3901
 Multifractals 999, 3717, 3718, 3720, 3738, 3759, 3767, 3775, 3843, 3893, 3898, 8524, 8536, 8537
 binomial 3775
 distribution 3747
 D_q 3722
 $f(\alpha)$ 3722
 log binomial 3747
 multifractal measure 3722
 multifractal scaling 3745
 Multifunctional composite 1284
 Multifunctionality 1541
 Multigraph 2201, 2203
 Multilayer 2850
 Multilayer feedforward artificial neural network 2143
 Multilayer neural networks 1817, 1818
 Multilayer perceptron (MLP) 2143
 Multilevel 2846, 2850
 Multilevel algorithms 1257
 Multilevel simulation 8411
 Multilevel theory 1559
 Multinomial logistic regression 6004
 Multiparticle entanglement, quantum computing 7242
 Multiplayer preceptron 4872
 Multiple attribute (or multiple criteria) decision support 7753
 Multiple criteria sorting 7753, 7754
 Multiple dealer markets 5394
 Multiple equilibria 3
 Multiple instruction multiple data (MIMD) 153
 Multiple-minimum-support fuzzy mining (MSFM) 4147
 Multiple network 8291, 8293, 8294, 8296, 8297, 8300, 8301, 8305, 8330
 Multiple objective optimization 7753
 Multiple-prover interactive proof 7192
 Multiple realizability 285
 Multiple recurrence 3044
 ergodic theory 3061, 3063
 polynomial 3044
 Multiple robotic system 2053
 Multiple rupture 2488
 Multiple scale transformation of variables 6212
 Multiple scales 5912
 Multiple systems 7373
 Multiple tunneling junction 9716

- Multiple vents 9849
 Multiplet 3876, 6734
 Multiplexing 5872
 Multiplicative ergodic theorem 2943, 4735
 Multiplicative noise 6229, 7014, 8778
 Multiplicity
 algebraic 6651
 of subgame perfect equilibria in the multiplayer game 4105
 Multiplicity function 8555
 Multiplicity sampling 8214
 Multiplier 1062, 6593, 6597
 Multiplier-accelerator model 8994
 Multiplier method 1493, 1494
 Multipotent cells 1192
 Multirelational networks 8263
 Multiscale 1719, 2351
 dyadic 1725
 geometry 1719
 pyramid 1725
 sub-band 1725
 transforms 1719
 Multiscale analysis 1939, 6663, 6666, 6671
 Multiscale complex systems 5914
 Multiscale modelling of nanostructures 5923
 Multiscale problems 6667
 Multiscale simulation 5676
 Multiscaling 7002
 Multiscaling function 5845
 Multiset 5524
 Multistability 639, 641, 1548, 4894
 networks 1193
 Multitable 1550
 Multistage control process under fuzziness 4077
 Multistage game with observable actions 4099
 Multisymplectic reduction 5498
 Multivariate 6882
 Multivariate autoregressive modeling 1434
 Multivariate GARCH, CCC model 4127
 Multivariate network 8322
 Multivariate regressions 2795
 Multivariate splines
 bivariate spline 5801
 box splines 5800
 spherical 5801, 5802
 trivariate 5802
 Multivariate stochastic volatility 4129
 Multivariate wavelets
 biorthogonal boxsplines 6867
 multivariate prewavelets 6892
 orthonormal box spline wavelets 6908
 spherical tight wavelet frames 6901
 splines 6888
 Multiview 1262
 Multiwavelet 5841, 10006
 balanced 5850
 boundary 5850
 lifting 5853
 moment 5846
 polyphase factorization 5852
 pre and postprocessing 5849
 prefilter 5849
 symbol 5844
 TST 5853
 Mumford–Shah segmentation model 10033, 10039
 Munakata 5473
 Murata 8840
 Music 8200, 8202
 fractal noise 3794
 Mutagenicity 2145, 2169
 Mutation 121, 3971, 4135, 4780, 4873
 Mutation operation 4150, 4874
 Mutational analysis 7036
 Mutual edges 5694
 Mutual entropy, biological information 498
 Mutual fund flows 3472
 Mutual information (MI) 1430
 networks 1201
 Mutual Kolmogorov complexity 494
 Mutualistic networks 3677
 Mutuality 4663
 Mutually orthogonal subspace 1623
 Mwp 9613
 M_{wp} method, tsunami warning 2666
 Myerson value 6045
 Myhill, J. 780, 783, 3539
 Mylonite zones 2651
 Myopia 6003
 Myopic profit maximization 1968
- N**
- n*-ary relation, definition 6301

- n*-Body problem 5960, 6588, 6681
absence of collision 5981
basic definitions 5962
choreographies 5959
conservation laws 5979
 $D_{4q} \times C_2$ group 5966
 $D_6 \times C_3$ group 5968
 $D_q \times C_2$ group 5967
eight shaped three-body solution 5964
G-equivariant minimizers 5982
generalized solution 5978
generalized Sundman–Sperling estimates 5980
gravitational 383
locally minimizing solution 5978
Neumann boundary conditions 5982
rotating circle property 5964
Standard variation 5983
- n*-Body simulation 5472
- n*-Clan 8288
- n*-Clique 8288
- n*-Club 8288
- n-Gram entropy, DNA sequence 495
- N-Particle W-state, quantum computing 7243
- N-Qubit Deutsch–Jozsa circuit 7382
- N-Soliton solution 4969, 4970
- ∇ -Extended density function 7446, 7447, 7449
- ∇ -Extended wave function 7444
- Nadel 8273
- Nadel, Siegfried 8268
- Nagel–Schreckenberg (NaSch) CA model 6776, 9289, 9335
- Nakajima–Zwanzig 8589
- Nano- 924
- Nano-device system 2112
- Nanocell 5882
- Nanocluster 5889
- Nanocomposites 1284
- Nanocomputer 5862
chemical 5863
electronic 5863
mechanical 5863
programming methods 5884
quantum 5864
- Nanodevices 7677
- Nanodiamond 9154, 9155
- Nanodot (minute dot) 9719
- Nanoelectromechanical systems (NEMS) 5917
- Nanoelectronic component
metallic nanoparticle 2111
metallic nanowire 2111
- Nanofabrication 2105, 5866
bottom-up 5866, 5874
top-down 5866
- NanoFabrics 5881
- nanoHUB 5762
- Nanoidentification problems 5918
- Nanomachines 5923
- Nanoparticle 5889
- Nanopeapods 9149
- Nanopiezotronics 5921
- Nanoscale device 7307
- Nanostructures 1305, 5747
- Nanotechnology 2090, 2105, 8577
- Nanotube 9149
Nanotube junctions 9149, 9150
- Nanowires 5751, 5777
- Nanson 9944
Nanson's procedure 9948
- Napier, John 5476
- Napier's bones 5476, 9705
- Naples 2398
- Narcissistic modeling, QSAR modeling 7076
- Narrow moving traffic jam 9326, 9358
- Narrow transcription 2317
- Narrowing by motion 8595
- NASA's Johnson Space Center 7845
- NaSch CA model 9290
- NASDAQ market 5395
- Nash equilibrium (NE) 437, 1530, 1587, 1662, 1669, 2217, 3177, 3178, 3180, 3185, 3187, 4855, 4857, 6643, 7618, 7655, 8381, 8651
mixed 1588
strong 1669, 1681
with complexity 4100, 4101
- Nash networks 6043
- Nash-reversion equilibrium 7656
- Nash stability 6027
- Nash stationarity 3184
- Nash, John F. 8381
- Nasu's theorem for cellular automata 2986
- National Airspace System (NAS) 237
- National Bureau of Economic Research 2753
- National Cancer Institute 2148, 2187
- Natural climate changes 1097

- Natural computing 283, 292, 4335, 4336, 9133
 Natural experiments, exogenously variation 5560
 Natural extension 2975
 Natural language processing (NLP) 8094
 Natural languages, fuzzy logic 3988
 Natural mechanisms 4798
 Natural selection 1923, 1924, 2908, 3209, 3278, 4873
 Natural time 2622, 2623, 2625
 Natural time analysis 2623
 Naturalization 4896
 Nature-inspired 923
 Navier–Stokes
 derivation of some fundamental a priori estimates 5944
 long-time behavior 5953
 uniqueness and continuous dependence on the initial data 5946
 Navier–Stokes approximation 4383
 Navier–Stokes equations 549, 881, 882, 1493, 3642, 3644, 3843, 4383, 5576, 5925, 5926, 5929, 5930, 5943, 6217, 6229, 8727, 9769, 9971, 10040
 compressible Newtonian fluid 3615
 derivation 5928
 global attractor 5953
 incompressible fluids 3615
 less regular solutions 5949
 partial regularity results 5949
 regularity 5946
 times of irregularity 5946
 turbulence 5954
 weak solutions 5931
 weak solutions and related properties 5949
 Navier–Stokes hydrodynamics 4388
 Navigation, map-based 6070
 NBER 5334, 5341, 5343
 NBTree decision tree 2165
 NC 6388, 6402, 6403
 NE *see* Nash equilibrium (NE)
 Near-miss 5353
 Near real-time material accountancy 4861
 1-Nearest neighbor 1792
 Nearest neighbor method 67, 1791, 1800, 3847
 average connectivity 2531, 2536
 Nearly-integrable Hamiltonian 4516, 5067
 Nears-hit 5353
 NEC 4107, 4111, 4112
 Necessity 4425
 Necessity measure 6927, 6929
 Necessity relations 6930
 Negation 4878
 Negative feedback loop 678, *see* Balancing feedback loop
 Negative feedback systems 560
 Negative selection 4781
 Negative-sum game 8381
 Negative temperature states 3648
 Negentropy 3275
 principle of information 4822
 NEGF 5779
 Negotiation models 4107
 NEIC 2478
 Neighborhood 164, 872, 1056, 4498, 7680, 8270
 clustering 577, 579
 configuration 65
 function 1823
 Margolus neighborhood 7681, 7690
 radius 1823
 system (NS) 4313, 4344, 4355, 4357
 Neimark–Sacker 6336
 bifurcation 5309, 6629
 Nekhoroshev
 estimates 6326
 stability 5993
 theorem 6714
 theory 405, 4519, 6681
 NEMO 3-D 5747, 5752
 Neo-liberalism 8381, 8382
 Neo-Piagetian theories 1896
 Neo-Piagetians 1898
 Neoclassical economics 203, 2285
 agent-based modeling 177
 assumptions 179
 game theory 181
 simplicity 179
 tractability 179
 Neologism proof 8132
 Neoteny 1918
 Nernst–Planck equation 5577
 Nervous system 6070
 Nervousness 6488
 Nested summation symbol (NSS) 7444, 7455
 Nestedness 2717
 Nesting vector 9696

- Nestling 7525
 Net benefit 1671
 Net flow score 7768
 .NET infrastructure, Microsoft 5607
 Net present value (NPV) 7846, 7847
 NetDraw 8848
 NetLogo, simulation tool 194
 Network 209, 235, 237, 239, 477, 528, 541, 544, 645, 653, 719, 860, 1049, 1182, 1244, 1821, 2875, 3661, 3856, 3924, 4182, 4486, 4487, 4492, 4911, 5999, 6049, 6099, 6100, 6104, 6411, 6415, 6555, 6644, 7953, 8233, 8246, 8266, 8322, 9113, 9742
 Airport and Airspace Network (AAN) 237
 Airport Network (AN) 237
 analysis 2729
 arc 6024, 9742
 architectural 477
 as complex systems 5692
 autopoietic 478
 autoregulatory 529
 behavior 238
 biochemical 544, 545
 biological behavior 1183
 Booleans 1197
 ccdf 238
 cellular 5699
 community detection 4612
 complex 234, 1191
 connections of the *C. elegans* brain 506
 critical 1200, 1201
 decomplexification 505
 degree 235, 238
 directed 6024
 dynamical 477
 dynamics 236
 dynamics behavior 1182
 edge 235
 emergent 543, 544
 evolution of information 502
 fault 4182
 flows 6407
 fractal 3925
 gene 527, 542
 gene regulatory 1249
 genetic interaction network 9114
 graph 2729
 growth models 1249
 heterogeneous 6024
 hierachic 544
 hierarchical 543, 725
 homogeneous 6024
 huge 8246
 in systems biology 1185
 label 6024
 labeled arcs 6024
 labeled links 6024
 large 236, 1201, 8246
 link 6024
 linking 6024
 local structure 507
 log fitness 505
 logarithmic 238
 metabolic 504
 micro-macro linkages 4610, 4613, 4614
 middle 8246
 motif information 507, 508
 multilevel models 4627
 mutual informations 1201
 neural 503, 6106
 nodes 235, 6024
 null model 1187
 protein–protein interaction 1186
 random 239, 503
 random graphs 4911
 randomly connected 6105
 real 236, 1202
 reciprocity, reciprocators 4617
 resilience 239
 scale-free 234, 3924, 4487, 4608, 4612, 4622, 4911, 9114
 seismic 2479
 self-similar 3925
 signaling network models 4611
 simple graph 6048
 small 8246
 small world 3925, 4911, 9114
 social 8266
 social networks 4911
 stability 236
 subgraph composition 507
 synchronization phenomena 1251
 targeted attack 239
 third-party intervention 4616

- topological 477
 topology 2729
 transcription factor 528, 543
 triad significance profile 5698
 vertex 9742
 weighted 4492
 without descendants 6039
- Network analysis
 algebraic methods 8266
 algebraic models 8273
 visualization techniques 8266
- Network analyzers 273, 3337
- Network architecture 1182, 1186
- Network autocorrelation 8307, 8308
- Network automata 8846
- Network barrier 1966
- Network-based interventions 8317
- Network biology 5700
- Network closure 6005
- Network complexity 502
 levels of 5693
- Network conditions
 changing 5614
- Network configuration 8323
- Network design 2093
- Network dynamics 8269
 genes 1188
 neuronal 6104
- Network effects 1965
- Network evolution 2742
- Network exposure 8309, 8311–8315
- Network externalities 1965
- Network formation 4097
- Network game 7625
- Network glass 6014, 6020
- Network (GRN) gene regulatory 1182
- Network homomorphism 8300, 8301
- Network inference 1186
- Network information bottleneck (NIB) 505
- Network matrix 8259
- Network modularity 506
- Network motifs 570, 572, 573, 578–580, 583, 584, 2718, 4835, 5660, 5694, 5695, 6053
 dynamic behavior of 5698
- Network payoff functions 6032
- Network properties 730
- Network reconstruction 5535, 5536, 5538, 5540
- Network robustness 6497
- Network sampling 8272
- Network state
 gene expression 1183
 genes 1188
- Network structure 8315
 analyzing 1186
- Network themes 572, 573, 581, 583, 584
- Network theory and topology studies, applications 3240
- Network topology 1182
- Network utilization 2068
- Network walk sampling 8221
- Neumann boundary conditions 6713
n-body problem 5982
- Neumann condition 6224
- Neumann series 5072, 5085, 6743, 6744
- Neumann, John von 257, 849
- Neural complexity 1424
 matching complexity 1433
- Neural correlates of consciousness 1424
 explanatory correlates 1440
- Neural ensembles 1558
 cellular 1558
 neuroanatomical 1558
 synaptic 1558
- Neural network approach 2246
- Neural network estimator 3514
- Neural networks (NN) 276, 280, 282, 283, 288, 721, 1784, 1813, 1993, 2123, 2210, 3339, 3344, 3355, 3358, 4137, 4871, 4900, 5882, 6067, 6087, 7992, 7993
C. elegans brain 503
 cellular 5875
 for traffic prediction 9515
 recurrent 280
- Neural synchronization 8005
- Neuraminidase 2146
- Neuro-fuzzy 3243
- Neuro-fuzzy control 1225
- Neuro-fuzzy systems (NFS) 4411, 6086
 architecture 6091
 criteria isolines method 6095
 effectiveness 6095
 for pattern classification 6093
 learning 6094
 logical-type 6089

- Mamdani-type 6090
 simplified 6091
 suboptimal 6095
 Takagi–Sugeno 6092
 with Lukasiewicz implication 6093
 with weights 6092
- Neuroeconomics 8199, 8209
 Neuromodulators 1555
 Neuron 1813, 1814, 2090, 6099–6102, 6104, 6105, 6111
 biological fractals 3789
 fractals 3794
 Neuronal coalitions 1439
 Neuronal network 4900
 Neuronal synchronization 1439
 Neuroscience 6100
 Neutral directions 999
 Neutral mutations 5657
 Neutron flow mapping, polymeric fluid 6825
 Neutrosophic computing 4403
 New ideas 8195
 New kind of science 8846
 New principle 1552
 Newell's optimal velocity traffic flow model 9334
 Newhouse 969
 Newhouse phenomenon 3019
 Newmann–Moser problem 5444
 News 5410, 5431
 Newton 6663
 equations 6588
 law of gravitation 6427, 6429
 method control law 2062
 scheme 5068, 5071
 tangent scheme 5084
 Newton–Fourier method 3834
 Newton method 6764
 Newton–Raphson 7407
 Newtonian fluids 5927
 Newtonian viscous body 1705
 Nexus sampling 8214
 NFS *see* Neuro-fuzzy systems
 NIB *see* Network information bottleneck (NIB)
 NIB algorithm, information curve 506
 Niche construction 1925
 Nicholson–Bailey model 2712
 NIED 2413
 Nielsen 7257
- Nilpotent perturbation 6650
 Nilsystem 3091
 Nintendo Wii-mote 2076
 Ninth GrC model 4347
 NIST 4D/RCS 8438, 8440
 Nitrogen content, plant tissue 1103
 Nitrogen fluxes 2702
 NL-computation, fuzzy logic 4005
 NLS equation 4962
 No-cloning theorem 7328, 7395
 quantum mechanics 7374
 No dictatorship 9937
 No envy test 1680
 No free lunch 4136
 No incentive to separate 8132
 No-slip 695, 5576
 No trade theorem 436
 Noble numbers 6682
 Nodal attribute 8330
 Nodal density 241
 Nodal distribution 240
 250G 241
 500G 241
 750G 241
 1000G 241
 Node degree 5694
 distribution 1244
 Node indegree 5266
 Node strength, distribution 6057
 Node to node communication 155
 Nodes 724, 1600, 4182, 4871, 8322
 control 155
 of a network 5694
 parallel computing 153
 physical mobility 5608
 worker 156
 Noise 281, 476, 730, 732, 1989, 3361, 3367, 6105, 6109, 8737
 autocorrelation function 3588
 colored noise 476
 conserved 3372
 correlation dimension 484
 external 3361, 3369
 extrinsic 8737
 extrinsic fluctuations 732
 fractal time series 3794
 input noise 733

- internal 3361
intrinsic 8737
intrinsic stochasticity 732
multiplicative nature 3594
noise in gene expression 732
output noise 733
quantum information processing 7388
single chain dynamics 6820
stochastic processes 3577
thermal 3369
white or brown noise 482
1/f noise 3805
Noise amplification 3510
Noise correlation 3372, 9680
Noise correlator 3369
Noise data, stochastic processes 3583
Noise-immune 1388
Noise-induced transition 6487
Noise measurements 6151
Noise probability distribution 3370
Noise sidebands 6118
Noise terms 83
Noise trader 98, 5412
Noise transfer function 6153
Noiseless subsystem 7389
Noisy circuits, stochastic processes 3586
Nominal 8342
Nomogram 272
Nomograph 271
Nonabelian routh reduction 5496
Nonanticipative strategy 1950
Non-archimedean infinitesimal 6290
Nonatomic 5461
Nonatomic game 1682
Noncanonical poisson brackets 5494
Noncoding DNA, fractal features 3797
Non-conservative force 4379, 4381
Non-cooperative game 4855
Non-cooperative game theory 1510
Non-cooperative implementation 1512, 1513
Non-cooperative or strategic game 1662
Non-cooperative rules 6034
Non-crossing condition 1131
Non-degeneracy condition 6681
Non-degenerate 2263, 5074
Non-determinism 820
Non-deterministic fractals 7568
Non-deterministic gate 7255
Non dictatorial 9938
Non-dictatorial 9937
Non-differentiable 3859, 3873
Non-emptiness problem 8906
Non-English-speaking household 3137
Non-equilibrium 209, 7025, 8040
asymptotic behavior 7024
Non-equilibrium Green's function (NEGF) 7413, 7480, 7483
Non-equilibrium phase transition 888, 1538, 8931, 8936
Non-equilibrium phenomena 5915
Non-equilibrium stationary state 1002
Non-equilibrium statistical mechanics 4379, 4380
Non-equilibrium steady state 6953
Non-equilibrium system 3270, 3282, 4897
Non-equilibrium thermodynamics 477, 3270, 8043
Non-equivariance one-cocycle 5485
Non-equivariant momentum maps 5485
Non-equivariant reduction 5490
Non-extensive systems 5253
Non-Fermi liquid behavior 7356
Non-generic networks 2831
Non-generic rigidity 2838
Non-holonomic integrator 6273, 8623
Non-holonomic mechanical systems 5498
Non-homogeneous boundary conditions, Navier-Stokes equations 5934
Non-homogeneous cellular automata 916, 3233, 3238
Non-integrable 384
Non-interacting chain, physics 6813
Non-invertible transformation, isomorphism theory 4992
Nonisotropic scattering 7920
Nonlinear 2285, 2846
Nonlinear brain dynamics 8003
Nonlinear cointegration 2758, 2760, 2763
Nonlinear correlations 3718
Nonlinear coupled effects 5922
Nonlinear coupling 1540
Nonlinear diffusion equation 5243
Nonlinear dispersion 9996
Nonlinear dispersion relation 9977
Nonlinear dispersive waves 9970

Nonlinear dynamical system 1554, 5719
 Nonlinear dynamics 8001
 ecosystems 2705
 Nonlinear effect 6956, 6964, 6969
 Nonlinear equations 274
 Nonlinear error-correction 3444
 Nonlinear estimator 4773
 Nonlinear field theory 8596
 Nonlinear filtering 10042
 Nonlinear flow, polymeric fluid 6824
 Nonlinear group velocities 10001
 Nonlinear mapping 5473
 Nonlinear multi-modal model 8961
 Nonlinear observer 4767
 Nonlinear open systems 477
 Nonlinear oscillation 6972
 Nonlinear oscillator potential 5225
 Nonlinear oscillators 1555, 5724
 Nonlinear panel data models 2781
 Nonlinear partial differential equations (PDEs) 6216, 8480, 8504
 Nonlinear partial least-square 2123
 Nonlinear periodic model 8960, 8961
 Nonlinear phase transitions 7992
 Nonlinear phenomena 1875
 Nonlinear QQSPR equations 7453
 Nonlinear response 2433
 Nonlinear Schrödinger equation 2050, 6138,
 6456, 6709, 6712, 6715, 8474, 9970, 10002
 NLS 1376
 Nonlinear Schrödinger equation (NLS) 6461
 Non-linear Schrödinger equations 7449
 Nonlinear Schrödinger equations 6231
 Nonlinear single-transient model 8960
 Nonlinear site effects 4440
 Nonlinear stiffening 2841
 Nonlinear systems
 controllability 4814
 fluctuations 3575
 observability 6375
 Nonlinear time series 3475, 3478, 3494, 3500
 Nonlinear transmission lines 8473
 Nonlinear wave equation 2048
 Nonlinear wave propagation in a building 2430
 Nonlinear waves 6206
 Nonlinearity 2428, 3829, 3843, 3867, 5415, 7996
 Nonlocal phenomena 5922

Non-manipulable 9938
 Non-Markov kinetic equation 1621
 Non-Markovity parameter 1624
 Non-mechanical proteins 7029
 Non-monotonic model 5026
 Nonnegative basis theorem 6247
 Nonnegative matrix 6239
 Non-Newtonian 5931
 Non-orthodox sampling methods 8214
 Nonparabolicity 7410
 Non-parallel model 156
 Non-parametric 3475, 3479, 3485, 3488, 3494,
 3500
 Non-parametric estimator 3443
 Non-parametric methods 7017
 Non-parametric test 6252
 Non-perturbative 7347
 Non-planar choreography 5969
 Non-planar minimizers 5975, 5977
 Non-planar symmetric orbit 5969
 Non-player characters 1336
 Non-recursive algorithms 3546
 Non-regular dynamic behavior of wide moving jams 9399
 Non-regular spatiotemporal jam dynamics 9401
 Non-representative samples 5569
 Non-resonance 6612
 Non-resonance condition 5311
 Non-resonant motion 6667
 Non-revealing game 7634
 Non-revealing strategy 7631
 Nonsingular automorphism 2938
 Nonsingular Bernoulli transformations 3061
 Nonsingular Chacón map 3061
 Nonsingular coding, ergodic theory 3075
 Nonsingular dynamical systems 3056
 Nonsingular ergodic theory 3056
 Nonsingular joinings, ergodic theory 3073
 Nonsingular maps, Cartesian products 3075
 Nonsingular odometers 3060
 Nonsingular systems
 spectral theory 3069
 unitary operator 3070
 Nonsingular transformation 5457
 ergodic theory 3055, 3056
 hopf decomposition 3057

- ITPFI 3068
smooth 3068
- Nonsmooth analysis 6271, 6272, 6274, 9105
- Non-standard analysis 4313, 6285, 7605
idealization principle 6304
overflow 6305
set-terminology 6300
standardization principle 6304
transfer principle 6304
ultra-power construction 6303
underflow 6305
- Non-standard stochastic analysis, Loeb construction 6306
- Non-stationarity 3756, 3758, 3764, 7021, 7996
- Non-stationary activity 9845
- Non-stationary process
Euclidean space of the state vectors 1619
normalization and attenuation of correlation 1618
statistical theory of a discrete non-Markov process 1618
Zwanzig–Mori’s kinetic equation 1618
- Non-synonymous mutations 5657
- Non-transferable utility game 1511
- Non-trapping invasion percolation (NTIP) 4949
- Non-uniform hyperbolicity 4733, 4735
- Non-uniformly expanding maps 963
- Non-uniformly hyperbolic systems 2968
- Nonwandering 2267, 8644
set 8644
- Noonan syndrome 9097
- Normal 6271
Normal boiling point 2199, 2210
Normal diffusion 3888
Normal distribution 3422, 4383, 7011
Normal fault 9614
Normal form 404, 713, 1038, 6175, 6183, 6310, 6335, 6628, 6632, 6633, 6650, 6761, 7139, 8927
Birkhoff 6320, 6321, 6324
game 3176, 3177
near equilibrium points 6591
procedure 331
semi-local 6321
takens 6321
theory 6652
truncation 4516
- Normal frequency 2263, 4530, 5082
- Normal inverse Gaussian distribution 3420
- Normal linearization 2263
- Normal modes 2263, 4537
nonlinear 6591
quantum computing 7231
- Normal state 4378
- Normal stress effect, liquids 5931
- Normal variables 994, 995
- Normalization 6311, 6627, 6629
- Normalize 6316
- Normalized 6315
- Normalized event memory function 1624
- Normalized Laplacian matrix 5354
- Normalized linear (Hamming) distance 4066
- Normalized mutual information 5356
- Normalized quadratic (Euclidean) distance 4066
- Normally hyperbolic invariant manifolds 944
- Norman 5473
- Normed counting measure, defintion 6307
- Normed space 5713
- Norming constant 4966–4968
- North Atlantic oscillation (NAO) 1075
- North west Pacific tsunami advisory center 9596
- Northridge earthquake 9180, 9194
- Northumbria University 3131
- Nosé–Hoover thermostat 695
- NOT 4878
- Notation 2982
- Notrade equilibrium 5397
- Novelties analysis 2391
- Novelty 1896, 3216, 3218
- Novelty analysis 2388
- Novelty detection 2381
- Nowotny and Requardt 8844
- Nozzle 9882
- NP 5468, 6388, 6393, 7091, 7096
complete 6402
hard 7103, 7110
- NP-complete problem 1542, 2093, 6418
- NP-hard 288
- NTIP *see* Non-trapping invasion percolation (NTIP)
- Nuclear binding energies 4826
- Nuclear polarization 8590
- Nucleate 615
- Nucleation 4497, 9771
parameters 4506

- Nucleation model for traffic breakdown 9283
 Nucleation probability 616
 Nucleation rate 9297
 for traffic breakdown 9296
 Nucleation zone
 earthquake 2539
 Nucleocapsid 9752
 Nucleolus 1662
 per capita nucleolus 1668
 Nucleosome 3894, 3896
 Nucleosynthesis bound 1636
 Nucleotide strand asymmetries 3918
 Nucleus 9359, 9361
 for traffic breakdown 9287, 9321
 required for the nucleation of an S → J transition 9361
 Nudged-elastic-band method 1313
 Null controllable 3528
 Null model, networks 1187
 Null space 5536
 Nullifying 6290, 6292
 Number of large 1-itemsets 4152
 Number of states 4098
 Number theory 3055
 Numerical approximation 1505
 Numerical attributes 7798
 Numerical integration 1038
 Numerical methods 5144, 5146, 5163, 7892, 9015
 Numerical simulation 8592
 Numerical studies 5024, 6602
 Numerically 5028
 Nutrients 2702
 Nyquist rate 10044
 NYSE, order system 5393
- O**
- Obesity 4577
 Object 206, 7754
 detection 3688
 manipulation 3688, 3697
 Object concept 1894
 Object extraction 9712
 Object level 7790
 Object permanence 1877, 1901
 Objective function 5536, 5541, 5999, 6002, 6009, 9034
 Objectives 7839
 Obligation 3138
 Oblique condition 6224
 Oblique extension principle (OEP) 597
 Oboukhov model 3658
 Observability 4811, 6371, 9105
 complete systems 6372
 deterministic systems 6371
 estimation error 6373
 geometric setting 6371
 indistinguishability relation 6373
 inequality 1490
 input-output map 6374
 linear systems 6374
 minimal systems 6373
 nonlinear systems 6372
 piecewise constant controls 6374
 rank condition 6374
 symmetric systems 6372
 weak indistinguishability relations 6373
 Observable 3533
 pressure of 6945
 quantum mechanics 7371
 Observable payoffs 7622
 Observation 5195, 7594
 space 6373
 Observational 2793
 Observational medicine 9092
 Observatory earthquake message 2660
 Observed covariates 2770
 Observer synthesis problem 6372
 Observers 6373
 arbitrary exponential rate 6374
 injectable systems 6378
 linear systems 6379
 persistent-excitation 6378
 skew-adjoint state linear systems 6379
 Obsessive-compulsive disorder (OCD) 8004
 Obstacle, avoidance 3687, 3689
 OCC model 1347
 Occam's razor 5198
 Occupation number 880, 8589
 Oceanography 8113, 8121, 8123
 Oct-tree 2409, 8695
 Octahedral partition 5815
 24-Octahedral periodic minimizers 5970
 Octane number 2198, 2199

- Octanol-water partition coefficient 2144
 OctArm 1477, 1478, 1483
 OctArm continuum manipulator 1475
 ODD *see* Overview, design concepts and details
 ODE frame work, meta-dynamical 332
 Odhner, W.T. 5476
 Odometers 9240
 Markov 3060
 nonsingular 3060
 Odometry 3682, 3684, 3688, 3693
 OEP 597
 Off-ramp bottleneck 9374
 Off-the-equilibrium payoffs 4112
 Offline learning 1816, 1819
 Ohm's law 1405, 9273
 Oil market models 685
 OIL (ontology interchange language/ ontology inference layer) 8092
 Olfaction 6112, 6113
 Oligopolistic innovation diffusion model 1964
 Oligopoly 7837
 OLSE *see* Ordinary LSE method
 Olshanski, A.Y. 780, 784
 Ω -Extended wave function 7445, 7447
 Omega-limit 4557
 Ω -Limit sets 4681
 Omega-squared model 2584
 Ω -Stability 4731
 OMEN 5780
 Omori 2614
 Omori's law 2559, 5025
 On-line 3243
 $O(n)$ model 8710, 8713, 8726
 On-ramp bottleneck 9372
 Onchocerciasis, effects of climate change 1101
 One-cocycles 5485
 One-component plasma 8579
 1D Brownian motion 8711, 8721, 8722
 1D CA 3236
 One-dimensional heat equation, controllability 4813
 One-dimensional neighborhood 3234
 1D random walk 8713
 One-forms, principle connections 5502
 One-fracton relaxation 2257
 One-mode data 8272
 One-out-of-n encoding 1821
 One-parameter scaling formula 8531, 8541
 One-particle distribution 7808
 One-qubit gate 7253
 One-round procedure 9947, 9955
 One-sided 3545
 One-step processes 8770, 9291, 9292
 Online internet applications of traffic prediction 9525
 Online learning 1816, 1819
 Onsager coefficients 3371
 Onsager–Machlup functional 8779
 Onsager statistical theory 3648
 Ontogeny 930, 1916–1919, 1922, 1926, 1928
 Ontological approach, agent-based modeling 192
 Ontology 8084
 for modeling and simulation 355
 Oort cloud 388
 OP *see* Ordinary percolation (OP)
 Open cluster 8696
 OPEN-DX 5761
 Open-ended evolutionary system 341
 Open-loop control 632
 Open-loop steady-state gain 8955
 Open physical system 8927
 Open science grid 5763
 Open system 3271, 8929, 9254
 Open-system operation 7388
 Operant conditioning 1886
 Operating principles 730
 Operation, disconnected 5614
 Operational amplifier 273
 Operational thinking 4565
 Operator 3861
 closed linear 1487
 collisional 9736
 covariant derivative 3872
 dilation 3869
 Floquet 6592, 6596
 gain 9736
 loss 9736
 Markov 8556
 quantum error correction 7340
 universal set 5865
 weighted 8555
 Operator norm 5085
 Opinion dynamics 7536
 Opinion formation 6492

- Opinion leaders 8309
 Oppenheim's conjecture 3105
 Opportunity cost 2285
 Optical clockwork 6117
 Optical computing 3356, 9135, 9705
 Optical lattice 7162, 7163, 9679
 Optical neural networks 6392
 Optical pattern recognition 6391
 Optical tweezers 7030
 OPTICS 5058
 Optimal algorithm 7119
 Optimal control 2004, 6272, 9105
 Optimal controls, existence 1502
 Optimal exponent 5992
 Optimal path 6501
 Optimal "stationary" policy 4103
 Optimal velocity 9417
 Optimality principle 1503
 Optimization 3354, 4190, 4494, 4781, 4900, 6272, 6407, 6408, 6491, 7848, 8869, 8871, 8875, 8988, 9034
 combinatorial 6407
 Optimization algorithms, QSAR modeling 7073
 Optimization principles 734
 Optimization problem 1900
 Optimization theorem, support vector machines (SVM) 4087
 Option pricing 4117
 Option pricing models
 empirical evidence 8792
 volatility and jump risk premium 8793
 volatility smile 8790
 volatility smirk 8790
 OR 4878
 Oracle 7088, 7090, 8673
 risk 8674
 Orbit 3053, 6426, 6427, 8631, 9225
 brake 6604, 6606
 closure relation 9229
 coadjoint 5487
 generalized 5976
 in closed non-simply connectedHill regions with boundary 6607
 in compact Hill regions with boundary 6606
 in compact Hill regions without boundary 6605
 internal periodic 6604
 non-planar symmetric 5969
 nondegenerate 6595
 normal 6595
 periodic 6595
 relation 9229
 relative periodic 6598
 sequence 9229
 Orbit classification, type III systems 3065
 Orbit reduced space 5491
 Orbit reduction theorem, symplectic 5491
 Orbit reduction, mechanical systems 5487, 5488, 5490
 Orbit space 5306
 Orbit theory, ergodic 3064
 Orbital stability 6434, 6436, 7606
 Order
 dominance 8354
 fractional 3863
 lexicographic 1667
 linear 9946
 median 9945
 of the reaction 329
 partial 9946
 Order backlogs 679
 Order-driven
 trading mechanism 5393
 Order flow 5420
 commercial-customer 5423
 customer 5429
 financial-customer 5423
 interdealer 5420
 Order parameter 627, 631, 635, 636, 648, 1275, 1538, 1539, 2723, 3361, 3626, 3850, 5719, 7993, 8004, 8713, 8715, 8927, 8928, 8930, 9683
 Order parameter equation 8933
 complexity in time 3576
 Order statistic, largest 3321
 Order statistics 229
 Order-to-order transition 7994, 7999
 Ordered field
 definition 6288
 extension 6288
 Ordered region 6427
 Ordering 3233
 definition 6291, 6292
 task 3238
 Ordinal classification 7753, 7754, 7760

- Ordinality 1682
 Ordinary differential equation (ODE) 1228, 2285, 3256, 8630, 8993
 artificial chemistry 332
 Ordinary least-squares estimator (OLSE) method 4084, 9193
 Ordinary percolation (OP) 4948
 Oregonator model 1355, 7549
 Organization 6978
 set theory 338
 syntactically and semantically closed 339
 Organization center 703, 714
 Organization principles
 DNA 3795
 Organizational cybernetics 8974, 8976, 8980
 Organizational learning 7849, 8988, 9044
 Organizer
 Nieuwkoop center 538
 Spemann–Mangold 538, 539
 vegetal pole 538
 Orientation distribution 6570
 continuum percolation 6509
 Orientation, fracture networks 6506
 Orientational order 2026
 Origami-based self-assembly 261
 Origami language 266
 Origami shape language 929
 Origin-Destination estimation 9450
 dynamic synthetic 9450
 static synthetic O-D 9450
 synthetic O-D 9450
 Origin of order 8045
 Origin of replication 3894, 3908
 Orness 228
 Ornstein D 784, 786
 Ornstein theory 3055
 Ornstein–Uhlenbeck process 5225, 5234, 8775
 Ornstein–Zernicke scattering function, polymer physics 6817
 Ornstein’s isomorphism theorem 4987
 Ornstein’s proof 4984
 Orthogonal collocation 6334
 Orthogonal mapping 3558
 Orthogonal wavelets 10020
 Orthogonality theorems 6736
 Orthogonalization 4739
 Orthography 2311
 International phonetic alphabet 2315
 Orthologous data 9094
 Orthonormal basis 10031, 10034
 Orthonormal M-wavelet basis 590
 Oscillations 538, 540, 541, 545, 729, 3146, 6099, 6100, 6108, 6110, 6112, 8201, 8205
 fast 6110
 gamma 6109
 nonlinear 7614
 pedestrian 3146
 relaxation 7603
 self-sustained 7603
 slow 6107, 6108
 sparsely synchronized 6109
 Oscillator 421, 535, 541, 892, 4240, 4241
 harmonic 7137, 7603
 Oscillator level 5724
 Oscillatory 535, 536, 540, 543, 545
 chaotic 527
 stable 527
 transient 527
 unstable 527
 Oscillatory dynamics 482
 biological clocks 485
 respiratory oscillations 483
 temperature-compensated 483
 ultradian clock 483
 Oscillatory flow 6482
 Oseen fundamental tensor, liquids 5939
 Oseledets theorem 960
 Oslo model 1136
 Osmotic pressure, polymer physics 6817
 Ostwald ripening 6467
 Other memories 832
 Other quantum key distribution protocols 7279
 decoy state protocols 7280
 differential-phase-shift-keying (DPSK) protocols 7282
 entanglement-based protocols 7280
 Gaussian-modulated coherent state (GMCS) protocol 7282
 strong reference pulse protocols 7281
 Other technique 1156
 Our common future 4635
 Out-of-equilibrium 7009
 Out-of-equilibrium behavior 7586

Out-split graph 8897
 Outcome 7773, 7999
 Outdegree 6241
 Outer Lindblad resonance 412
 Outer measure 5455
 Outer rise 9584, 9589
 Outgassing 3286, 3295
 Outlier 1989, 2409
 Output elasticity 2285
 Output function 3524
 Output-injection, observers 6378
 Output layer 1815, 1818, 1822
 Outstanding problems 6672
 Over-crowding 6487
 Over-deceleration effect 9334
 Over-dispersed 9838
 Over-searching 5350
 Overall connectivity index 4833
 Overall Wiener index 4833
 Overall Zagreb indices 4833
 Overbooking 7844, 7845
 Overconfidence 3473
 Overconstrained cluster 2835
 Overdamped Brownian motion 8776
 Overfitting 1816
 Overlap factor 4152
 Overlap QSM 7448
 Overlapping community 1146
 Overlapping-generations model 2819
 Overlapping of two Fano resonances 7297
 Overruns 1846
 Overshoot 5416
 Overtime 1852
 Overtraining 1816
 OWA 229
 OWL (Web ontology language)
 DL 8084
 full 8084
 lite 8085
 Oxametallacycle, eclipsed 1330
 Oxidative phosphorylation
 energy supply 480
 inner mitochondrial membrane ion
 channels 480
 Ozone concentration, Germany 1099
 Ozone hole, human health 1099

P

P 5468, 6388, 6393, 6402
 P and S wave velocity models for Taiwan 9199
 P-Boundary 7756, 7761, 7769
 P-Coda 7926
 P-Dimension 5216
 P-Dominance 7767
 P-Elementary sets 7755
 P-Glycoprotein (Pgp) 2168
 P-Glycoprotein (Pgp) 2127
 p-Graph 8258
 P-Lower and P-upper approximation 7769
 P-Lower approximation 7755, 7760, 7767
 p-Model 8539
 p-n-p-n device 9714
 P system 928, 5524
 P-Upper approximation 7755, 7760, 7767
 P-Wave 2662, 2666
 large earthquakes 2543
 P wave 2476, 2482, 2607, 2611
 P-Wave magnitude
 short-period 2481
 P-Wave magnitude scale 2665
 P-Wave velocity pulse 2539, 2540
 p^* model 8319, 8320
 p_1 model 8321
 p_2 model 8321
 PAC learning 5210, 5211
 Pacific tsunami warning center 2478, 2484, 9596
 Pacific tsunami warning center (PTWC) 2659
 Packard 4500
 Packing
 deformable 5000
 frictional 4999
 frictionless 4999
 isostatic 5000
 rigid 4999
 Packing fraction 5015
 Packing number 5206, 5213
 Pad binding mechanism 5478
 Padé approximants 6740, 6746
 Padé-approximants 6634
 Padé approximate 6207
 PageRank 5273
 Painlevé's theorem
 n-body 5978

- Paintable computing 262
 Pair cascade 35
 Pair-correlation function 5016, 8576
 Pair-distribution function 8576, 8578
 Pair of biorthogonal M-wavelet bases 591
 Pair of dual M-wavelet frames 591
 Pairing 9683
 Pairing symmetry 9698
 Pairwise comparison 9948
 coefficient 9948
 method 9943
 table 7766
 Pairwise independence, property 8558
 Pairwise instance similarity 5354
 Pairwise majority voting 9935, 9937
 Pairwise stability 6027, 6042
 Pajek 1256, 8848
 Palais–Smale condition 6612, 6621–6623
 Paleoclimate 3
 Paleoseismological 2562
 Paley–Littlewood partition of unity 2044
 Palindromes 744
 Palis conjecture 959
 Palis–Yoccoz theorem 3019
 Panarchy 4632
 Panel data 5554, 6006, 8313
 fixed effects 5570
 incidental parameter 5566
 random effects 5554
 Panic 3146, 3151, 3153, 3154, 6476, 9421
 Pappus of Alexandria 232
 Parabolic 1725, 2264, 4521
 Parabolic equations
 degenerate 1506
 nonlinear 1493
 Parabolic scaling law 1725
 Parabolic systems 3020
 Parabolic wave equation 7921
 Parabolic wedge 1727
 Parabolicity, uniform 6219
 Paradigm 4187, 7832
 amorphous computing 260
 programming 259
 shift 7833
 Paradox of voting 9934, 9939
 Parallel algorithms 7892
 Parallel cellular machines 3238
 Parallel computation thesis 6402
 Parallel computing 1702, 5439
 agent-based modeling 153, 157
 massively 259
 Parallel dynamical system 165
 Parallel electric field 22, 32
 Parallel time 6402
 Parallel Turing machines 748
 processor complexity 748
 relations between PTM complexity 749
 space complexity 748
 time complexity 748
 Parallel, massively 6400
 Parallelism 5525
 Paramagnetic state 8712
 Parameter 731
 optimization 6480
 space 1696, 6994
 Parameter estimation 51, 6006
 Parameter régimes 1554
 Parameterized complexity 9959
 Parametric amplification of vacuum fluctuation 1635, 1638
 Parametric driving 5734
 Parametric excitation 2323, 6626, 6627, 6629, 6633
 Parametric oscillator 8940
 Parametric resonance 2323, 6626
 combination 2334
 Parametric stabilization 1557
 Parametrically excited pendulum 6634
 Parametrized core set 7462
 Pareto distribution 2801
 Pareto-dominates 3332
 Pareto-efficient 9936
 Pareto-optimal set 7778, 9042, 9936
 Pareto property 9945
 Pareto, Vilfredo 2793, 7011
 Parity check matrix 7327
 Parkfield segment 7855
 Parkinson's disease 627, 630, 1626
 PARPACK 5755
 Parry measure 2984
 Parry's entropy 3071
 Parsimony principle, neuro-fuzzy systems 6095
 Parsons, Talcott 8268
 Part relation 4420

- Partial algebra 8292, 8296, 8299
 Partial algebraic 8293, 8305
 Partial conditional dependence 8326
 Partial containment 1796
 Partial covering (PCov) 4345
 Partial differential equations 5800, 6655, 7892
 biharmonic equations 5827
 fluid flow simulation 5830
 modeled by amorphous computing 264
 Navier–Stokes equations 5830
 Poisson equation 5823
 Partial effects 2771
 at the average 2781
 Partial FSSP solution 3553
 Partial history within a stage 4106
 Partial hyperbolicity 4733
 Partial result authentication codes (PRAC) 5612
 Partial role algebra 8296
 Partial semigroup 8296
 Partially hyperbolic difeomorphism 3099
 Partially hyperbolic system 965, 2966
 group extensions 2968
 time-One maps of Anosov Flows 2968
 Partially ordered algebra 8292, 8294
 Partially ordered semigroup 8292, 8293, 8295, 8297
 Partially revealing strategy 7632
 Participative model building, system dynamics 4572
 Particle 772, 3233, 3237
 collisions in the n-body problem 5961
 computational 259
 fluid 5928
 quantum 3863
 Particle communication, in amorphous computing 267
 Particle filter 8805
 Particle identity in amorphous computing 267
 Particle size distribution 9799
 Particle swarm optimization (PSO) 123, 1788, 2122, 8869, 8875
 Particle trajectories 4219
 Partition 1141, 4103, 4359, 8247, 8290
 Partition coefficient 2200
 Partition function 1271, 3768, 5015, 8538, 8539, 8715, 8717
 Potts model 3741
 Partition matrix 1779
 Partitioning of elastic energy 2591
 Parts 1540
 Pascal 9412
 Pascal, Blaise 5476
 Pascaline 5476
 Pass-transistor logic 9720
 Passive abstractions, agents as 194
 Passive elasticity 7040
 Past a sphere at increasing Reynolds numbers, flow 5940
 Patchwork evolution 5663
 Path 2201, 2211, 3860, 6031, 6241, 8250
 augmenting 6415
 shortest 6409
 successive shortest path algorithm 6411, 6413
 Path coordination 5789
 Path dominance 6036
 core 6027, 6040
 Path effects 4435, 4440
 basins and other deterministic deviations from a flat-layered model 4435
 broadband wave-propagation computations 4468
 far-field displacements of P- and S-waves 4453
 incoherently scattered wave energy 4454
 random heterogeneities in the three-dimensional velocity-density structure 4435
 ray theory 4453
 wave-propagation in heterogeneous media 4437
 waves in a flat-layered attenuating earth 4435
 Path-generated cost sharing rules 1682
 Path integral 8591, 8937
 polymer physics 6811
 Path integral representation, stochastic processes 3580
 Path integrals 3370, 8778
 Path integration 7126
 Path planning 1225, 6071
 Pathogens 425
 Pathways 719, 724, 4835
 Patient flows, characteristics 4571
 Pattern 782, 4179, 8048, 8926, 10032
 and interfaces in dissipative dynamics 8947
 chaotic 6464
 earth-specific 4190

- glassy 6473
hexagonal 6462, 6464
mutually erasable 783
premonitory 4179
striped 6464
support 782
3D 6462
universal 4189
wave 6468
- Pattern formation 3361, 8947
and pattern recognition in the city 7962
- Pattern growth 5440
- Pattern informatics (PI) 2441
- Pattern modeling process 8996
- Pattern pattern matching 9515
- Pattern perception 8003
- Pattern recognition 3314, 4185, 8938, 9855
- Pattern searching 8257
- Patterning 1901, 1904
- Pattison, Philippa 8274
- Paul trap, spherical 7223
- Pauli exclusion principle 4824
- Pauli matrices 7333
- Pauli potential 8583
- Pavlov, I.P. 1886
- Payne's macroscopic traffic flow model 9335
- Payoff 9034
Markovian strategy 2223
- Payoff dominant equilibrium 3196
- Payoff function 1528, 9036, 9040
- Payoff type 5184
- Payoff vector
approachable 7625
decomposable 7626
- PCL *see* Primary constraint language
- PCTs *see* Primary care trusts
- Peak ground acceleration 2400
- Peakon 80, 84, 87
- Peano curve 8710
- Peapods 691
- Pebble game 6014, 6017, 6019, 6020
- Pebbles 2839
- PEC 4101, 4107, 4111
PEC is always competitive in 4110
- Pedersen conductivity 33
- Pedestrian 3144, 6476
Pedestrian area module 3147
- Pedestrian dynamics 9413
Pedestrian traffic 1180
Peer-to-peer (P2P) search engine 5281
- Pendulum
damped pendulum 8634, 8635
pendulum with torque 8646
- Pendulum equation 6621, 6622
- Pendulum model 6792
- Penetration pricing 1969
- Penguin effect 1965
- Penning trap, quantum computing 7224
- Penrose tilings 3614
- Pentagon-heptagon 699
- Pentagonal tessellation 893–895
- Per-site entropy
E. coli tRNA sequence 496
rodent homeodomain 500
- Perceived implications 7839
- Perception 1225, 3134, 6492
computational theory 4005
concept of 193
- Perception-action cycle 4895
- Perceptron 1817, 2143, 4427
learning rule 1817
- Percolating networks 2255
- Percolation 609, 1137, 1443, 3708, 3721, 3737, 5670, 5676, 6412, 6495, 6504, 6784, 6806, 7014, 7568, 8710, 8713–8715, 8726
backbone of the percolation cluster 1449
biological fractals 3789
bond 1443, 3849, 6579, 6580
cluster 1443
conducting backbone 3744
Coniglio's theorem 3747
continuum 1450, 3849
conventional 609
critical number of bonds 1452
directed 1137
exponent 3852
fracture networks 6507
hopping 3850
invasion 3848
inverted random void 1444
k-core 623
lattice 1448
nodes, links, and blobs picture 3743
oriented 610

- percolation threshold 1447
 polymer physics 6819
 probability of 6511
 quasi-one-dimensional “bubble” model 3748
 rigidity 610
 site 1443, 3849, 6579
 site-bond 3849
 threshold 3847, 3849
 transition 6414
 transition zone 6513
 tunneling 1444
 Voronoi 6586
 Percolation cluster (IPC) 319, 7568, 8714
 finite 319
 probability of 6512
 Percolation conduction problem 1405
 general 1405
 standard 1405
 Percolation critical threshold 3791
 Percolation models 2561
 Percolation network 3880, 3882
 Percolation parameter 6511
 Percolation probability 6541
 Percolation properties 6514
 fracture networks 6510
 geological fractures 6505
 Percolation theory 1395, 1397, 2722, 6566
 Percolation threshold 1395–1397, 1401, 1403,
 4956, 6497, 6510, 6512, 6513, 6539, 6541, 6542,
 6544, 6566, 6579, 6580, 8715
 Percolative models 1396
 Percolative system 1395
 Perfect adaptation 731
 Perfect equilibrium with complexity 4101
 Perfect market 2285
 Perfect matching 6419
 Perfect recall 4863
 Perfect reconstruction 10023, 10024
 Performance 4187, 7839
 algorithm 4187
 Performance moderator functions 1347
 Perihelion 6677
 Period 6243, 7605
 minimal 6590
 refractory 7606
 Period distribution 2533, 2536
 Period doubling 377, 407
 Period-doubling 6336
 Period-doubling bifurcation 2271, 4523, 5308
 Period-doubling route to chaos 2719
 Period multiplication 6136, 6166
 Period of a network 8296
 Period solutions, perturbed 8643
 Periodic attractors 8425, 8426
 Periodic like trajectories 6710
 Periodic medium 6416
 Periodic orbit 405, 6426, 6428, 6429, 6674, 6684
 Periodic orbit theory 7164
 Periodic point 172, 5306, 9248
 measure 6949
 Periodic solution 5301, 6321
 subharmonic 6322
 Periodic structure 9250
 Periodicity 9835
 Periodicity conditions 6430
 Periodicity of earthquakes 2558
 earth tides 2558
 Peripherality 8271
 Permafrost
 dynamics 1715
 models 1714
 Permeability 1399, 2616, 2679, 6567, 9767, 9775,
 9792
 fracture networks 6516
 Permutation 5439, 8358
 Permutation tests 6266, 6267
 Permutative CA 2981, 9253
 Perrier’s loop 8072
 Perron–Frobenius theorem 6242, 6243
 Perron root 6242
 Perron theorem 6242
 Perron vector 6242
 Perron’s method 6222, 6223
 Persistence 3757, 6311
 Persistent 6311
 Persistent current 7671, 7676
 Persistent property 4519
 Personal identity 1906
 Personal mastery 9047
 Personal network exposure 8309
 Personalized medicine 9092
 Perspective projection 56

- Perturbation [731](#), [1541](#), [1881](#), [5722](#), [6310](#), [6311](#), [6649](#)
 attractors [1205](#)
 geometrical [7607](#)
 network parameters [731](#)
 problem [6311](#)
 regular [7607](#)
 singular [7604](#), [7607](#)
 state perturbations [731](#)
- Perturbation expansion [3364](#), [3365](#), [3367](#), [3369](#)
- Perturbation problem [4516](#)
- Perturbation theory [6163](#), [6175](#), [6673](#), [6724](#), [6730](#)
 free fall [6725](#)
 Rayleigh [6725](#)
 soliton [6163](#)
 vibrating string [6725](#)
- Perturbative expansions [3361](#), [3370](#)
- Perturbative methods [623](#), [7527](#)
- Pervasive computing, amorphous [269](#)
- Peschansky [3547](#)
- Pesin [2862](#)
- Pesin entropy formula [960](#)
- Pesin theory [960](#)
- Pest [1075](#)
- PFSM [3696](#)
- Phage λ [730](#), [8736](#)
- Phantom panic [6487](#)
- Pharmaceutical synthesis [417](#)
- Phase [3352](#), [4195](#), [4197](#), [5728](#)
- Phase condition [6331](#)
- Phase diagram [652](#), [5001](#), [5014](#), [5035](#), [9680](#)
 jammed [5001](#)
 point j [5001](#)
- Phase diffusivities [6463](#), [6469](#)
- Phase dynamics [6463](#), [6467](#)
- Phase equilibria [6465](#)
- Phase estimation algorithm [7384](#)
- Phase field [6465](#)
- Phase field models [3636](#)
- Phase locking [1544](#), [6636](#), [9680](#)
- Phase noise [6117](#)
- Phase plane [6131](#)
- Phase plots [8828](#)
- Phase portrait [6330](#), [7137](#)
- Phase protection mechanism [6447](#)
- Phase-response-curve [6108](#)
- Phase scattering [1550](#)
- Phase separation [6467](#), [6784](#), [9681](#)
 polymeric fluid [6828](#)
- Phase shift [1020](#), [7610](#), [8480](#)
 quantum computing [7238](#)
- Phase shift operator [5310](#)
- Phase shift oscillators [562](#)
- Phase space [166](#), [483](#), [695](#), [2264](#), [2860](#), [4516](#), [6136](#), [6177](#), [6426](#), [6994](#), [7997](#), [7999](#)
- Phase speed (celerity) [8483](#)
- Phase transition [1544](#), [1545](#), [1899](#), [3361](#), [3371](#), [3756](#), [3847](#), [3849](#), [4894](#), [4910](#), [4998](#), [5024](#), [5674](#), [5719](#), [6382](#), [6772](#), [7855](#), [8000](#), [8004](#), [8005](#), [8040](#), [8199](#), [8206](#), [8277](#), [8367](#), [8369](#), [8370](#), [8713](#), [8714](#), [8724](#), [8928](#), [9416](#), [9734](#)
 absorbing state [3366](#)
 active to absorbing [3368](#)
 continuous [611](#)
 equilibrium [4998](#)
 ergodic theory [6940](#)
 fluctuations [4998](#)
 jamming [4998](#)
 non-equilibrium [4998](#)
 nonequilibrium [3368](#), [3369](#)
 polymer physics [6819](#)
- Phase trapping [1550](#)
- Phase turbulence [6473](#)
- Phase velocity [9969](#), [9977](#)
- Phase wrapping [5733](#)
- phaseRes [6398](#), [6399](#), [6401](#)
- Phasic average [2679](#)
- Phasor amplitudes [6148](#)
- Phenomenological synergetics [8929](#), [8937](#)
- Phenomenology [4893](#)
- Phenotype [118](#), [9106](#)
 quantitative phenotype [9112](#)
- Pheromone [8869](#), [8871](#), [8877](#)
- Phi complex [8206](#), [8208](#)
- Philippine Institute of Volcanology and Seismology (PHIVOLCS) [9867](#)
- Phillips machine [8992](#)
- Philosophical background and underpinnings [8988](#)
- Philosophical structuralism [6796](#), [6797](#)
- Philosophy [4894](#)
- Phishing [4373](#)
- Phone [2310](#)
- Phoneme [2310](#)

- Phonology 2310
 Phonon regime 2256
 Phonons 700, 701
 Phosphofructokinase 562
 Phospholipidosis 2171
 Photochemical smog, global warming 1098
 Photodetection 6146
 Photoelectric effect 7251
 Photosynthesis 3280
 temperature dependence 1102
 Phylogeny 930, 1916, 1926
 Physical agents 1338
 Physical biology, ecological systems 2700
 Physical computation 3221
 Physical evolution 3270, 3279
 Physical gels 6546, 6547, 6563
 Physical interaction force 6485
 Physical measure 4731
 Physical mobility of nodes 5608
 Physical models, biological fractals 3785
 Physical parameterizations 7594
 Physical processes in volcanoes 1223
 Physical systems 3836
 Physically relevant measures and strange Attractors 2969
 Hénon Diffeomorphisms 2971
 Intermittent Maps 2971
 Unimodal Maps 2970
 Physics 188
 of non-regular spatiotemporal dynamics 9403
 of the city 9411
 Physiological synchronization 7995
 Physiological time series 1624
 Piaget, J. 1885, 1896, 1898, 1903
 Piagetian 1896
 Piaget's main stages 1885, 1888, 1899
 Picard iteration 3261
 Picard–Lindelöf theorem 3261
 Picking 2411
 Piezo-electric effect 2621, 2623
 Piezo-electric polarization 2630
 Piezoelectric 5765
 Piezoelectricity 5752, 5763
 Pimephales promelas 2148
 PIN *see* Protein interaction networks
 easley and O'Hara model 5399
 Pinch effect in synchronized flow 9289, 9358
 Pinch region 9394
 Pinch region of synchronized traffic flow 9323
 Pinched torus 2264, 4531
 Pinhole camera model 4753
 Pinning 1126, 1129, 2019, 6469
 impurity 1129
 length 1129
 Pinsker σ -algebra 2928
 Pinwheel calculator 5476
 Pipelining in amorphous computing 266
 Pismen 8940
 Pitch angle 24
 Pitchfork 6633
 Pitchfork bifurcation 5305, 5722
 Plan abstraction 5190
 Plan-space planning 5192
 Planar 3-body problem, symmetry groups 5972
 Planar equivariant minimizer 5968
 Planar flow of a viscous liquid past a cylinder 5941
 Planar graphs 1254
 Planar homography 4752, 4756, 4767
 continuous 4767
 matrix 4753, 4757
 Planar motions, liquids 5930
 Planar symmetry groups 5972
 3-body problem 5971
 Plane convex fractures, excluded volume calculation 6508
 Planetary problem 6683
 Planetary rover 3690
 Planetary three-body problem 6428
 Planetary exploration 3683
 Planetesimal 8696
 Planets 3274, 3279
 Planforms 6461, 6462
 Planimeter 5474
 Planning 7850, 7953, 8377
 and decision making 8443
 interactive 7850
 Planning knowledge
 domain-configurable 5192
 domain independent 5192
 domain-independent heuristics 5189
 domain-specific 5192
 domain-specific control knowledge 5189
 Planning operators 5191

- Planning systems, interactive 7850
 Plant-pollinator networks 2736
 Plants 3280
 impacts of climate change 1102
 Plasma 8523
 Plasma analogy 8576, 8586
 Plasma instabilities 31
 Plasma resonances 8526
 Plastic flow 699
 Plasticity 628, 639, 641, 6112
 synaptic 629, 641, 6111
 Plate motions, measurement using GPS 4255
 Plausibility ordering 6930
 Player set 1520
 Player/Stage 2078
 Players 1660, 3327, 8698
 Players' preferences 6026, 6031
 strong preferences 6026
 weak preferences 6026, 6031
 Playground swing 2324, 2343
 Pleiotropy 9106
 Plug 9769, 9881
 Plug-in probability, DNA sequence 495
 Plural rationality 7834
 Plurality rule 9947, 9954, 9955, 9960
 Plurality rule with run-off 9948, 9955
 Pluripotent cells 1192
 Pluto 6445
 PMFserv 1347
 Pochhammer–Chree equation 6455
 POEtic machines 930
 Poincaré map 6435
 Poincaré 704, 6663
 Domain 8635
 Poincaré–Birkhoff fixed point theorem 6439
 Poincaré domain 6653
 Poincaré–Dulac normal form 6179
 Poincaré–Dulac theorem 6720
 Poincaré–Lindstedt 6627
 Poincaré–Lindstedt 6627, 6629, 6630
 Poincaré–Lyapounov–Nekhoroshev theorem 6186
 Poincaré map 5306, 6336, 6426, 6435, 6447, 8638,
 8644
 Poincaré mapping 2265, 4518
 Poincaré maps 6168
 Poincaré Operator 6613
 Poincaré operator 6612, 6614
 Poincaré recurrence principle 3085
 Poincaré Recurrence Theorem 3054
 Poincaré renormalized form 6187
 Poincaré section 384, 2265, 6195, 6203, 8639
 Poincaré transformation 6178
 Poincaré's theorem 6663
 Point
 critical 6600, 6610
 minimum 6600
 multiperiodic 6610
 Point j 5011, 5015, 5016
 Point of view
 Eulerian 9729
 Lagrangian 9729
 Point reduction, mechanical systems 5487, 5490
 Point source 2485, 2488
 Point source model 2485, 2488
 Point system 9954
 Point vortex motion 3647
 Point vortex system 3647
 Point/configuration, random 255
 Pointedness 1444
 Points 8267, 8270
 fixed 6104
 Pointwise convergent sequence 3256
 Pointwise D2 7997
 Pointwise dimension
 ergodic theory 3017
 hyperbolic measure 3023
 Pointwise ergodic theorems 3058
 Poiseuille flow, biological fractals 3783
 Poiseuille solution 9772
 Poisson 5765
 Poisson brackets 2264, 5447, 6587, 6589, 6713
 noncanonical 5494
 Poisson distribution 2558, 7585
 Poisson process 2558
 Poisson equation 5577, 7315, 8696
 Poisson–Lie structure 5447
 Poisson manifold 5447, 5493
 Poisson probability distribution 6145
 Poisson process 3445, 6002, 6009, 6144, 9835
 nonhomogeneous 9836
 simple (homogeneous) 9835
 stationary 9836
 Poisson ratio 9776
 Poisson space 2264

- Poisson structure 2264
 Poisson suspensions, ergodic theory 3076
 Poisson symmetry 2264
 Poisson's equation 7487
 Poland 4927
 Polarity in amorphous computing 265
 Polarization 3218, 5766, 6121
 Polarization field 6121
 Polarization loop 8581
 Polarization state 1378
 Polarized 3218
 Polaron 9680
 Polaron problem 8591
 Pole placement 8619
 Pole shifting theorem 3534
 Policy 7845
 Policy aware web 8094
 Policy design 7847
 Policy making 8377
 Policy optimization 9034, 9038
 Policy parameter 7848
 Political economy 2285
 Political ignorance 9937, 9941
 Political rhetoric 8136
 Politics 3137
 - fission 4618, 4619
 - median duration 4620
 Pollen allergies 1100
 Pollution
 - anthropogenic 7842
 - carbon-dioxide (CO₂) 7845
 Polydisperse fractures 6506, 6511
 Polyelectrolyte 6816
 Polygons, fracture networks 6506
 Polylogarithmic TDMA broadcast 2054
 Polymer blend 6827
 Polymer chain, ideal non-interacting 6813
 Polymer chemistry, autocatalytic 332
 Polymer contour 6814
 Polymer physics 6810
 Polymer statistics 6813
 Polymerase 419
 Polymerase chain reaction 2093
 Polymeric fluid 6824
 - dynamics 6819
 - multi-phase 6827
 Polymerization 6811
 Polymers 1304, 6409
 - directed 6409
 - nonlinearity in composite 1304
 Polynomial 712
 Polynomial recurrence ergodic theory 3063
 Polynomial representation 4739, 4743
 Polynomial time reduction 5468
 Polyphase matrix, multiwavelet 5849
 Polyproteins 7032
 Polzik 7263
 Pontryagin's maximum principle 1503, 2012
 Popescu 7257
 Population 3115, 4134
 - concentration index 4620, 4622
 - dynamical fractals 3793
 - Malthusian effects of resource scarcity 4622
 - power-law growth 4622
 - resource scarcity 4623
 - resources 4626
 - world 4622
 Population averaged effect 2776
 Population biology 8777
 Population code 3350
 Population coding 3350
 Population density 1047, 1049
 Population dynamics 3362, 3368, 4925, 6466
 - biological fractals 3780
 Population game 3176, 3180
 Population growth 1057, 1058
 Population inversion 6120
 Pore coordination number 4952
 Pore fluid pressure 10049, 10052
 - Hubbert–Rubey fluid pressure 10050
 Pore geometry 2687, 4952
 - measurement 4952
 Pore pressure 2616
 Pore scale geometric correlation, invasion percolation 4955
 Pore scale structure 4951
 Pore scale topology, measurement 4952
 Pore size distribution 4953
 Pore topology, invasion percolation 4952
 Pore tortuosity 4953
 Poroelasticity 2686
 Porosity 2687, 9780, 9792
 Porosity wave 2685

- Porous media 6566
 fractured 6505
- Porous media equation 6231
- Port Douglas 3129
- Pöschl-Teller potential 7666
- Pose 48
- Pose estimation 4765, 4770
- Poset 9945
- Position 8289
- Position limits 5410
- Positional equivalence
 exact 8340
 institutional 8344
 observational 8343
 regular 8339
 structural 8339
- Positive correlation 3185
- Positive feedback 565
- Positive feedback loop *see also* Reinforcing feedback loop, 683
- Positive hole (p-hole) 2623, 2630–2632
- Positive-real lemma 8756
- Positively expansive, cellular automata 2985
- Positively invariant set 6615, 6618
- Positivism, management science 9066
- Possibilistic constraint, fuzzy logic 3998
- Possibilistic logic 6931
- Possibility 4425
 comparative 6928
 conditional 6931
 guaranteed 6927
- Possibility correspondence 432
- Possibility distribution 6927, 6929
 subjective 6935
- Possibility function 4877
- Possibility measure 6927, 6929
- Possibility relations 6930
- Possibility theory
 fuzzy logic 4005
 qualitative 6930
 quantitative 6932
- Possible source geometries 9913
- Possible worlds 8341
- Post-earnings announcement drift 5416
- Post Keynesian economics 8996, 8998
- Post-Moore's law 291
- Post-Moore's law computing 3335
- Post-Moore's law computing 3336, 3358
- Post-project 1862
 lessons 1862
- Post-transcriptional regulation, transcripts 4171
- Posterior density 445, 448
- Posterior distribution 443, 456
 conditional posterior distributions 451
- Posterior odds 446
- PostgreSQL 2404
- Postmodern city 7957
- Postseismic deformation
 afterslip 4273
 and high-rate GPS 4276
 poroelastic response 4273
 viscoelastic response 4273
- Postulate
 Born 3874
 von Neumann 3874
- Potein tyrosine phosphatase 1B 2146
- Potential 1395, 1548, 3244, 4962, 4967, 6101
 extracellular 6100
 gauge 3876
 intracellular 6100
- Potential customers 1960
- Potential energy surface 1309, 1312
- Potential fields 5792, 6071
- Potential function 1666, 5720, 6003, 6044, 6429
- Potential game 3186, 3197
- Potential perturbation 7407
- Potential shaping 2015
- Potential surface 281
- Potential systems, stochastic processes 3586
- Potential well 8482
- Potts 7825
- Potts model 3740, 6420, 8710
- Poverty alleviation 8989
- Power law 22, 219, 477, 1049, 1050, 2715, 2812, 3863, 4664, 4934–4936, 4938, 4940, 6108, 6490, 7011, 8238, 8240, 8263, 8277, 8367
 behavior 6773, 8544
 distribution 1899, 4665, 5022, 5269, 7011, 7996
 function 2801, 2813
 inverse 477
 network 570, 575, 577–579
 scaling behavior 5027
 size distribution 661
- Power mean 228

- Power series 6761
 expansions 5074
- Power set, definition 6302
- Power spectral analysis 479
 fast Fourier Transform 481
 spectral exponent 479
- Power spectrum 1279, 3760, 3774, 3804, 8712
- Powersim 9015
- PPP 5428
- PRAC *see* Partial result authentication codes
- Pragmatic frame 355
- Prandtl number 3626
- Pre-Robinson infinitesimals 6286
- Preacceleration 27
- Prebiotic evolution 8940
- Precautionary principle 4639
- Precession 6677, 6679
- Precipitation 2612, 7596
 monthly mean precipitation 7591
 summer precipitation 7601
 winter precipitation 7599
- Precisiated natural language (PNL) 4005
- Precisiation types, fuzzy logic 3995
- Precisiation, fuzzy logic 3990, 3994, 4004
- Precision 271, 273, 274, 276, 281, 283, 291
 fuzzy logic 4004
 limited 4048
- Precursor film 3622, 3633
- Precursors
 complete model 2568
 of volcanic eruptions 9855
 partial model 2569
- Predation 8355
- Predator-prey interactions 8772
- Predator-prey relations 6131
- Predecessor states 64, 73
- Predicate calculus 349
- Predictability 3454, 4179
- Predictable and reproducible pattern features 9378
- Predictable and unpredictable phase 5598
- Predictable features
 of effectual road traffic bottlenecks 9519
 of traffic time series 9519
- Prediction 456, 2143, 3301, 9862, 10010, 10022
 advance 3315
 algorithm 3302
- problem 3301
 targets 3302
- Prediction intervals 6935
- Prediction rule 5178
- Predictive distribution 456
- Predictive modeling
 classification 1991
 regression 1991
- Predictive network 9095
- Predictive QSAR modeling
 flowchart 7080
 workflow 7079
- Predictor-corrector 7407
- Predictors 3244
- Predominant period 2412
- Preference aggregation 9943
- Preference function 6009
- Preference information 7760, 7782
- Preference model 7753, 7782
- Preference relation 1660, 7760, 7766
 comprehensive 7766
 graded 7766
 strength of 7766
- Preference supernetworks 6032
- Preference voting 9948
- Preferences 2243, 7769, 7770, 7774, 7778, 9655, 9943
 additively separable 9655
 bi-normal 1678
 cardinal utility 1673
 complete preorder 7770
 for simple strategies 4110
 interval scale 7770
 maximin 9655
 numerical non-quantitative scale 7770
 ordinal scale 7770
 over action profiles 1669
 over consequences 1669
 quantitative scale 7770
 responsive 9655
 $r(f)$ -separable 9655
 rich domain of preferences 1673
 strictly convex 1677
 strictly quasi-concave 1677
 strongly substitutable 9655
 substitutable 9655
 utility function 1669

- Preferential attachment [725, 6004, 6051, 8238, 8240](#)
 fitness model [6052](#)
 linear [6052](#)
 nonlinear [6052](#)
- Preferential attachment rule [8263](#)
- Preferential voting [9948](#)
- Preferential voting procedure [9955](#)
- Preferred-basis [6247](#)
- Preferred basis theorem [6247](#)
- Pregeometric theories of emergent space-time [8843](#)
- Prehension development [1899](#)
- Prenatal development [1900](#)
- Preorder, complete [9946](#)
- Preparation [3110, 3131](#)
 community [3111](#)
 hazard zone [3111](#)
 household [3111](#)
 household safety preparedness and action index [3114](#)
 individual [3111](#)
 precautionary action [3111](#)
 ramp-up [3110, 3113](#)
- Preparedness [3113](#)
 conceptual shift [3116](#)
 growth industry [3115](#)
 holistic [3122](#)
 household preparedness and safety action index [3115, 3122](#)
 institutional barrier to change [3115](#)
 knowledge base [3114](#)
 people's propensity to respond [3114](#)
 possible travel mode [3114](#)
 public participation [3116](#)
 well-being [3114](#)
- Preplay communication [1588](#)
- Preschool years [1901](#)
- PreSEIS [2398](#)
- Present-value constraint [3452](#)
- Present-value model [3454](#)
- Presentation duration [2245](#)
- Presentationism [9063, 9064, 9066, 9067](#)
 in system dynamics [9067](#)
- Preserved fibrations [4600](#)
- Preserving property [5738](#)
- Preslip model
 earthquake nucleation process [2541](#)
- Pressure [696, 697, 700, 701, 1851, 6484](#)
 ergodic theory [6939, 6942](#)
 observable [6945](#)
 variational principle [6946](#)
- Pressure recovery [6966](#)
- Pressure-stimulated current (PSC) [2629, 2632](#)
- Pressure-stimulated polarization effect [2623](#)
- Prestige [8240](#)
- Pretty good measurement [7102, 7106](#)
- Prevalence [954, 8316](#)
- Preventive [9096](#)
- Preventive medicine [9092](#)
- Price [2810, 4625, 4626](#)
- Price cascades [5416](#)
- Price changes, probability densities [3592](#)
- Price-contingent orders [5415](#)
- Price discovery [5432, 9570, 9573–9575](#)
- Price of anarchy [1681](#)
- Price wars [7838](#)
- Pricing strategies [1968](#)
- Primary care trusts (PCTs) [4566](#)
- Primary constraint language (PCL) [4000](#)
- Primary constraints, fuzzy logic [3999](#)
- Primary membership, type-2 fuzzy sets [4013](#)
- Primary resonance [6633](#)
- Priming [2245](#)
- Primitive
 for amorphous computing [263](#)
- Primordial GWs [1635](#)
- Principal-agent [4096, 6977](#)
- Principal-agent problems [4856](#)
- Principal bundle, connections of [5500](#)
- Principal component analysis [1776, 2574](#)
- Principal connections [5493, 5500](#)
 definition [5502](#)
- Principal fiber bundle [2264](#)
- Principle
 anisotropy [9733](#)
 conservation of the vehicles [9729](#)
 covariance [3875](#)
 Hamiltonian variational [6608](#)
 of detailed balance [2809](#)
 of systems [8996](#)
 of the least action [6600](#)
 variational [6600](#)

- Prior 448, 450
 natural conjugate priors 448
- Prior distributions 435, 443, 445, 456
 natural conjugate prior 445
 ‘non-informative’ prior 445
- Prioritized planning 5788
- Prisoner’s dilemma 181, 1528, 5679, 6645, 7617, 8381, 8382
 iterated 8382
 n-person 1529
 spatial 8382
- Privacy 8094
- Private information 5427
- Pro-activeness 187
- Proactive persistent agent (PPA) architecture 1346
- Probabilistic algorithms 9960
- Probabilistic Boolean network 167, 518, 606
- Probabilistic cellular automata 872
- Probabilistic constraint, fuzzy logic 3998
- Probabilistic features of traffic breakdown 9283, 9321
- Probabilistic finite state machine (PFSM) 3696
- Probabilistic graphical models 1229
 causation 1229
 conditional independence 1229
 dependence 1229
 directed 1229
 graph 1229
 undirected 1229
- Probabilistic models 727, 1227
- Probabilistic nature 9379, 9380
- Probabilistic networks 585
- Probabilistic neural networks (PNN) 2154
- Probabilistic product 4067
- Probabilistic reasoning 4874
- Probabilistic rule 1865
- Probabilistic SDCA 8836
- Probabilistic seismic hazard analysis (PSHA)
 2415, 4435, 4464
 ground-motion prediction 4464
 microzonation studies 4460
- Probabilistic traffic breakdown model 9293
- Probability 456, 7822, 9297
 ergodic 3017
 imprecise 4049, 6933
 of a fuzzy event 4073
- of passing 9736
- of traffic breakdown 9284
- of velocity class transitions 9740
- presence 3874
- statistical inference 1228
- uncertainty 1228
- Probability amplitudes 7253
- Probability content, definition 6306
- Probability current 3371, 8772
- Probability density 2801
- Probability density function 2396, 2399, 2407, 2450, 6992, 7015, 8931
 Gaussian 9192
- Probability distribution 3317, 3364, 3370, 4822, 5025, 7010, 8721
 conditional 3582
 fuzzy logic 3994
 reduced density matrix 7374
 stochastic processes 3579
- Probability distribution functions 7601, 8530, 9192
 non-Gaussian 8530
- Probability forecasts 2571
 entropy scores 2572
 Kullback–Leibler distance 2572
 probability gain 2572
 R-score 2572
- Probability measure 8716, 8718
- Probability monads 6801
- Probability space 6300
- Probability theory, fuzzy logic 4004
- Probit 2748, 2750
- Problem
 Abelian stabilizer 7095
 associativity testing 7108
 Banach 8557
 Bernstein and Vazirani 7092
 black-box 7090, 7091
 class number 7096
 claw-finding 7098
 collision finding 7097
 commutativity testing 7108
 coset orbit 7112
 database search 7097
 decomposing Abelian group 7096
 Deutsch–Jozsa 7092
 Deutsch’s 7095

- discrete logarithm 7089, 7094, 7095, 7106
 dynamic game 2220
 Eigenvalue estimation 7094
 element distinctness 7098, 7107
 factoring 7089, 7091, 7093, 7096
 fixed-energy 6604
 Gauss sum 7106
 generalized hidden shift 7105
 generalized Simon's 7095
 glued-trees 7108
 graph automorphism 7100
 graph isomorphism 7100, 7102
 ground state 7100, 7114
 hidden coset 7105
 hidden linear function 7095
 hidden linear structure 7104
 hidden polynomial 7104
 hidden radius 7104
 hidden shift 7105
 hidden translation 7105, 7113
 hiding sublattice 7103
 local search 7097
 matrix product verification 7108
 matrix sum 7103, 7106
 maximum-finding 7098
 median-estimating 7098
 min-max tree 7109
 NAND-tree 7108
 of output regulation 9080
 orbit coset 7105
 order finding 7093, 7094
 order-finding 7090, 7095
 ordered search 7097
 Pell's equation 7103
 period-finding 7093, 7095
 phase estimation 7094
 principal ideal 7103
 Rokhlin's multiple mixing 8558
 Rokhlin's uniform multiplicity 8562
 search 7090, 7096
 self-shift-equivalence 7095
 shift-equivalence 7105
 shifted subset 7104
 Simon's 7092
 state distinguishability 7102
 subset sum 7102, 7103
 triangle-finding 7108
 unit group 7104
 Problem solving 5739, 7850
 Problem structuring 4484
 Process fragments 929
 Process, T, T^{-1} 2929
 Processes in time 3585
 Processing dynamics 2243
 Processing GPS 8856
 Processor power, agent-based modeling 152
 Product diffusion 681
 Product launch 1968
 Product life cycle concept 681, 1958
 Product of a scalar and a fuzzy set 4068
 Product of networks 8259
 Product-space approach 7487
 Production 7847
 Production factor 2285
 Production game 7625
 Production market games 1523
 Production mechanisms of relic GWs 1638
 Production rules 3210
 Production sharing 1660
 Production systems 1110
 Productivity 680, 1851, 1859, 2285
 Products 2972
 Profile 4367, 4368, 9943, 9945
 similarity 8281
 Profit 2818, 7847
 Profitability 7842, 7843
 Progenitor cells 1192
 Program 280, 1542, 9441
 CODESSA 2210
 CONCORD 2209
 DRAGON 2210
 logical mobility 5608
 mobile agents 5604
 MOLCONN 2210
 OASIS 2210
 POLLY 2210
 TOPOCLUJ 2210
 TRIPLET 2210
 Programmable multitude 929
 Programming 3234
 distributed 5605
 genetic 4136

- global state of 5608
 localities in 5608
- Programming abstraction, amorphous computing 262
- Programming paradigm, amorphous computing 259
- Projected function 594
- Projected mask 594
- Projection 44, 4880, 6730
- Projection normalization 50
- Projection operator
 supplementary 1620
 technique 1624
- Projection-slice-theorem 1720
- Projection technique 8589
- Projective limit 431
- Promise problems 7175
- Pronation-supination movements 5730
- Proof trees 5202
- Proof verification 5612
- Propagating structures 6468
- Propagating wave 7295
- Propagation 879, 1135
 crack 1135
- Propagation modeling, infrasonic wave 4844
- Propagation of chaos 7808, 7809
- Propagation operator 880
- Propagation speed 6465, 6466
- Propagator 8591
 estimation 3583
 finite time 3581
 structure, polymer physics 6814
- Proper action, mechanical systems 5486
- Proper degeneracy 2264
- Proper graph 6845
- Properties 8246
- Property (T) 3103
- Proportional demand game 1678
- Proportional-integro-differential (PID)
 feedback 638
- Protein engineering 7036
- Protein folding problem 7045
- Protein interaction networks (PIN) 3789, 5656
- Protein-ligand docking 2122
- Protein nanomechanics 7029
- Protein networks 5700
- Protein–protein interaction networks 1186
- Protein–Protein interactions 7516
- Protein secondary structure, applications 3240
- Protein translocases 7042
- Proteins 418, 722, 6014, 6016, 6020, 6021, 6023
 as logic signal 258
- Proteome 5538
- Proteomic 5537
- Proto (programming language) 262
- Protocol, ODD 157
- Prototypicality 2246
- Provably convergent cooperative controls 2053
- Proximal 9237
- Proximal subgradient 8627
- Proximity data 8308
- Prudent orders 9951
- Prudent orders procedure 9956
- Pruning
 postpruning 1837
 prepruning 1836
- Pseudo-chaotic systems 990, 995, 1009
- Pseudo-extensive 2865
- Pseudo-intensive 2865
- Pseudo-likelihood 8322, 8328
- Pseudo-spectral method 7896
- Pseudo-spin 8576
- Pseudogas 9807
- Pseudolattice 1395, 1403
- Pseudopotentials 5751
- Pseudorandom number generator (RNG) 5669
- Pseudospectrum 7
- PSMS *see* Pure stationary Markovian strategy
- PSO 8875–8880, 8882
- PSPACE 5468, 6388, 6393, 6402
 complete 6402
- Psycho physics 8939
- Psychodrama 8267
- Psychological balance 8233
- Psychology 3134, 4893
 subjective uncertainty 3133
- Psychopathology 4900
- Psychophysical relaxation 7993
- Psychotherapy 7994, 7999, 8001, 8003, 8006
- PTWC *see* Richard H. Hagemeyer pacific tsunami warning center
- Puberty 1905
- Pubeval 4144
- Public communication 7627

- Public goods 1674
 Public health 8307
 Public-key encryption 2093, 7254
 Public policy 7062, 8989
 Public policy problems 7058
 Pucci operator 6219, 6221
 Pull model of mobility 5606
 Pulling geometry 7039
 Pulsar magnetospheres 24
 Pulsar timing bound 1637
 Pulsars 34
 Pulsating stars 390
 Pulsation 9773
 Pulse generator 564
 Pumping arguments 806
 Pumping lemma 819
 Punishments 4102
 Purchasing power parity 2285, 5426
 Pure shear 5012
 Pure shear flow, liquids 5930
 Pure state 2869
 Pure stationary Markovian strategy 2223
 Purification, quantum channel 7391
 Push model of mobility 5606
 Pushdown stores 805
 Pycnocline 6206, 8505
 PyDSTOOL 6349
 Pyroclastic flow 9803, 9822
- Q**
- Q Factor 9916
 q -Fourier 2872
 q -Gaussians 2871
 q -Independent 2873
 q -Product 2872
 q -State Potts model 1606
 q -Triplet 2873
 (q,α) -stable distribution 2874
 QAM 7194
 QCA
 block-partitioned 7160, 7161
 classically controlled 7161
 computationally universal 7155, 7156, 7158, 7161
 continuous-time 7160, 7161
 Grössing-Zeilinger 7157
 Hamiltonian 7160, 7161
 local-unitary 7159–7161
 nonunitary 7160
 partitioned Watrous 7158
 quantum-dot 7156
 reversible 7159, 7160, 7163
 Watrous 7158, 7161
 QCCD *see* Quantum charge-coupled device (QCCD)
 QCMA 7189
 QIP 7190
 QKD *see* Quantum key distribution (QKD)
 QMA 7185
 error reduction 7187
 QMA-hard 7114
 QMAM 7194
 QMC 8583
 QMIP 7193
 QQSPR fundamental equation 7427, 7438, 7439
 QQSPR operators 7425, 7459
 QRG 7194
 QSAR 2114, 2160, 2200, 2210, *see* Quantitative structure activity relationships
 three-dimensional 2209
 two-dimensional 2209
 QSAR modeling 1303, 7071
 QSAR models
 applicability domains 7078
 consensus 7082
 QSPR 2200, 2210, 7424
 QSTR 2197
 QSZK 7192
 Quadratic error 7468
 Quadratic error function 7440
 Quadratic family 962
 Quadratic mean 228
 Quadratic return variation
 Black–Scholes model 8786
 definition 8786
 Merton jump–diffusion model 8787
 short definition 8783
 Qualia 1425, 8003
 Qualitative fuzzy sets 4347
 Qualitative modeling 673
 Qualitative research 8371, 8372
 Qualitative theory 6709
 Quality 1973

- Quality function 1145
 Quality of approximation 7756, 7761, 7769
Quanta 7364
 Quantified Boolean Formula 752
 Quantifying uncertainty 4465
 Quantile regression, semiparametric estimators 555
 Quantitative modeling 5720
 Quantitative parameter of the quality of treatment 1626
 Quantitative structure activity relationship (QSAR) 2114, 2140, 2160, 7071
 Quantitative thinking 4565
 Quantitative trait locus (QTL) 9106
Quantum 843, 3859
 Quantum advice 7194
 Quantum algorithms 7121, 7239, 7399
 Deutsch–Jozsa 7204
 future 7388
 Shor's 7206
 Quantum architectures, qubus 7211
 Quantum bit *see also* Qubit
 error correction 7243
 quantum computing 7220
 Quantum cellular automata 7155
 Quantum channel 7332
 capacity 7391, 7392
 dephasing 7332
 depolarizing 7332
 quantum erasure 7332
 Quantum chaos 1007, 7164
 Quantum charge-coupled device (QCCD) 7223
 Quantum circuit 7174, 7177, 7240
 distinguishability 7191
 natural representation 7177
 oracles 7180
 polynomial-time generated 7181
 universal gates 7178
 Quantum circuit diagram 7380
 Quantum classical correspondence 8927, 8933
 Quantum coherence 7387
 Quantum communication 7368, 7391
 Quantum complexity class 7174
 Quantum computer 5748, 7363, 9645, 9705
 Quantum computing 1307, 5297, 5774, 7155, 7201, 7218, 7367, 7377, 7379, 9128, 9133
 adiabatic 7214
 cluster state 7212
 continuous variable (CV) 7211
 digital 7202
 error correction 7204, 7205
 one way quantum computer 7212
 topological 7213, 7390
 Quantum computing speedup 7119
 Quantum corrections 7413
 Quantum cryptography 7368, 7395
 Quantum data bus 7231
 Quantum data compression 7113
 Quantum discrete Fourier transform 1022
 Quantum dot 1305, 5750, 5913, 7309, 7343, 7344, 9644
 complex 9645
 double 9645
 double quantum dot 7353
 in the quantum 7323
 in the ring 7295
 lateral or planar QD 7310
 linear chains of quantum dots 7355
 self-assembled structures 9645
 stacked 5769
 triple 9646
 vertical QDs 7310
 Quantum effects 2091
 Quantum electrodynamics 6664
 Quantum entanglement 2878
 Quantum error-correcting code 7389
 five-qubit code 7336
 nine-qubit code 7331
 QECC 7332
 seven-qubit code 7334
 Quantum error correction 7242, 7243
 Quantum Fourier transform 7094, 7100–7102, 7105, 7240, 7260, 7382
 Quantum gate 1015, 7231
 CNOT gate 7203
 conditional phase shifter gate 1021
 controlled-NOT 1016
 Hadamard 7203
 Hadamard gate H 1015
 NOT gate 1015
 reversible 1015
 Toffoli gate 1016
 universal set of 1015
 universal set of gates 1017

- Quantum hacking 7283
 attacks 7283
 counter-measures 7285
 importance of quantum hacking 7285
- Quantum holography 3358
- Quantum impurity model 7344
- Quantum impurity problems 7346
- Quantum information 7172
 carrier 7224
 sending 7391
 transmission 7368
- Quantum information processing 7361
 and control 5922
- Quantum information science 7399
- Quantum information theory, implication 7396
- Quantum interactive proof systems 7174, 7189
 parallel repetition 7191
 public-coin 7193
- Quantum interactive proofs with competing provers 7194
- Quantum interference 4194, 4195, 4208, 4209, 7296
- Quantum jump detection 7229
- Quantum key distribution (QKD) 7267, 7286, 7395
 battle-testing QKD systems 7287
 calculation of the quantum key capacity 7287
 equivalence between phase and polarization encoding 7270
 example of a simple eavesdropper attack:
 intercept-resend attack 7270
 ground to satellite QKD 7287
 key distribution problem and one-time 7267
 multi-party quantum key distribution and entanglement 7287
 quantum no-cloning theorem and quantum key distribution (QKD) 7268
 quantum repeaters 7286
 security proofs with testable assumptions 7287
- Quantum Loschmidt echo 7164
- Quantum mechanical effects 5747
- Quantum mechanical Langevin equation 8932
- Quantum mechanics 1552, 3352, 4313, 4317, 5675, 7364, 7369
 quantum postulates 4319
- Quantum memories 7259
- Quantum Monte Carlo 8576, 8582, 8586
- Quantum non-demolition 7258
- Quantum object set 7430
- Quantum objects 7425, 7430
- Quantum optics 8940, 8943
- Quantum parallelism 7380
- Quantum particle systems 6218
- Quantum phase transition 7136, 7346, 7357
- Quantum point contacts 8608
- Quantum potential 3353
- Quantum probe 7290
- Quantum process tomography 7259
- Quantum proof 7174, 7185
- Quantum QSPR (QQSPR) fundamental equation 7434
- Quantum refereed games 7194
- Quantum register, initialization 7226
- Quantum repeater 7259
- Quantum search 7386
- Quantum self-similarity measure 7446
- Quantum setting with randomized queries 7130
- Quantum similarity 1302, 7424
- Quantum similarity Aufbau 7432
- Quantum similarity matrix 7426, 7431, 7435, 7461
- Quantum similarity measure 7446, 7452
- Quantum simulation 7215, 7384
- Quantum state distinguishability 7192
- Quantum systems 5243
- Quantum teleportation 7240, 7256
- Quantum transport 7319, 7350
 ballistic 7350
 charge-ordering regime 7355
 conductance quantum 7350
 cotunneling 7350
 coupled master (or rate) equations 7319
 Fano resonance 7353
 Meir-Wingreen formula 7351
 Mott-Hubbard insulating behavior 7355
 overlap matrix element 7319
 scattering phase shift 7358
 single-particle tunneling rate $\gamma_{L(R)}$ 7319
 state occupation factors 7319
 transition rates 7319
 tunneling rate 7319
- Quantum tunneling 9647
- Quantum Turing machine 7196
- Quantum uncertainties 4318

- Quantum walk 7091, 7097, 7098, 7105, 7106, 7113, 7206, 7387
 continuous 7107, 7108
- Quantum weirdness, quantum information processing 7375
- Quantum well 5751, 5774
- Quantum wire 7404, 7664, 8608
- Quasi-arithmetic means 228
- Quasi-attractor 8000, 9233
- Quasi-condensate 9693
- Quasi-degenerate case 6734
- Quasi-finite type 968
- Quasi-homogeneous potentials, n -body problem 5982
- Quasi-invariance 5457
 ergodic theory 3069
- Quasi-linear equations 38
- Quasi-linear system 6721
- Quasi-linear utilities 5514
- Quasi-long-range order 9684
- Quasi-monochromatic waves 7921
- Quasi-OWA 230
- Quasi-periodic 2264, 4516, 5066, 6626, 6627, 6632, 6637, 9239
- Quasi-periodic motion 1934, 5064, 6663
- Quasi-periodic oscillations 776
- Quasi-periodic solution 5066
- Quasi-periodic torus 6322
- Quasi-solitons 8480
- Quasi-stability 6037
- Quasi-weighted mean 229
- Quasibound state 7300, 7668
- Quasicrystals 6462
- Quasidynamic fault models 7859
- Quasigroup 2996
- Quasiprobability distribution 8933
- Quasistatic fault models 7859
- Quaternary volcanoes 7924
- Quaternion estimate 55
- Qubit 1014, 5774, 7202, 7253, 7369, *see also*
 Quantum bit
- Bloch-sphere representation 7227
 - charge flying qubits 1012
 - complexity 7119
 - decoherence-free subspace 7238
 - hyperfine 7229
 - hyperfine state 7224
- implementation 7225
 - mapping 7233
 - metastable state 7224
 - quantum computing 7220
 - state, vibrational structure 7232
 - storing 7223
 - universal set of gates 1013
- Qubus 7211
- Queensland 3125, 3137
- QueensOD 9454
- Quenched random “pinning” force 5026
- Quenching 2333, 7521, 7606, 9689
- Query answering 1533, 1535, 1536
- Query complexity 7119
- Query connection graphs 10067
- Query language 1533, 1534
- Quetelet, Adolphe 8380
- Quillen–Suslin theorem 595
- Quorum sensing 423, 724
- Quotient algebra 6289
- Quotient by eventuality, definition 6292
- Quotient-set, definition 6287
- Quotient space 4360, 5736
- Quotient space theory 4403
- Quotient state (external state) 4348
- Quotient structure (QS) 4341, 4348, 4350
- QV 8786
- R**
- R-Partition 5461
- R&D-process 1974
- Rabaul Caldera (Papua New Guinea) 9867
 false alarm 9867
 stage-2 alert 9867
- Rabi-frequency 7229
- Rabi-oscillation
 ion 7229
 quantum computing 7227
- Racial and ethnic health disparities 4586
- Radar 3832
- Radcliffe-Brown, Alfred 8267
- Radial basis function 3335, 3344, 3350, 3356
- Radial basis function network (RBF network)
 1822, 2146, 4872
- Radial SLE 8724
- Radiated energy 2585

- Radiation 3273
 Radiation condition 6209
 Radiation energy density 3274
 Radiation Era 3274
 Radiation losses 8480
 Radiation models 2587
 Radiation pattern 2482, 2487, 2583
 Radiative transfer theory 7916
 Radio astronomy 22
 Radiocarbon dating 9833
 Radius 7826
 of gyration, higher moments of 6848
 Radon transform 1720
 inverse 9175
 Radon, domain 1720
 Raghunathan conjecture 3105
 Rainbow trout 2145
 Raman-transition, Rabi-frequency 7229
 Ramified torus bundle 2264
 Ramp metering 3952
 Randić index 6838
 Randić molecular connectivity 2200
 Random
 nested 6933
 numbers, independent 7585
 Random-access magnetic storage 7835
 Random attacks 8263
 Random bond 2022
 Random chessboard 1402
 Random choice in amorphous computing 263
 Random close packing 5013
 Random cluster model 1607
 partition function 1612
 Random coefficient models 5568
 quasi-random numbers 5569
 random coefficient logit 5568
 simulation-assisted estimation 5569
 Random coefficients 2788
 Random conductance 7529
 Random curve 8721, 8724
 Random effects 2774
 Random effects models 5570
 numerical integration 5566
 random intercept model 5566
 Random field 2022, 3475, 3484, 3485, 3648
 Random field Ising model (RFIM) 5023
 Random first order theory 4223
 Random force 2023, 5729
 Random forest 2165, 5322
 Random forests method 4091
 Random fractal 3880, 3882, 7572
 Random fractal curve 8713
 Random fuzzy set 8683
 Random graph 2531, 2534, 2837, 6050, 6787, 7823, 8214, 8261, 8276
 Erdős and Rényi 6050
 network 8911
 Random homogeneous mixing 4660, 4661
 Random inhomogeneity 7915
 Random manifold 2019, 2023
 Random map 8721
 Random matrices 7025, 7505
 orthogonal ensembles 7505
 symplectic ensembles 7505
 unitary ensembles 7505
 Random matrix theory 7164, 7505
 Random midpoint displacement method 3774
 Random multiplicative process 3813
 Random network 503
 models 8266
 Random noise 5722
 Random percolation 1598
 Random-phase approximation 8576, 8581
 Random potential 2023, 6409, 6414, 6416
 Random power law graphs 7500
 Random proportionate growth 1053
 Random resistor network 1398, 1405
 Random search 2091
 Random set, fuzzy 4000
 Random spanning tree 8727
 Random stress drop 5028
 Random subspace method 5322
 Random tree 2165
 Random trend model 2777
 Random utility model 5555
 conditional choice probabilities 5556
 conditional logit 5556
 multinomial logit 5556
 multinomial probit 5556
 nested logit 5556
 Random variable 3317
 Random void 1444
 Random W-cascades 3900, 3903

- Random walk [311](#), [884](#), [1396](#), [3706](#), [3749](#), [3760](#), [3805](#), [3884](#), [4907](#), [5027](#), [5670](#), [5733](#), [7025](#), [7521](#), [7568](#), [7569](#), [8710](#), [8713](#), [8768](#)
- betweenness [1150](#)
- biological fractals [3785](#)
- boundaries [3077](#)
- escape probability [3751](#)
- exit probability [3749](#)
- hypothesis [3438](#)
- in disordered media [8591](#)
- on random walk [314](#)
- Pólya's Theorem [3750](#)
- polymer physics [6813](#)
- recurrence [3077](#), [3751](#)
- transience and recurrence [3750](#)
- with non-stationary increments [3077](#)
- Random walker, definition [6308](#)
- Randomized network, motif information [508](#)
- Randomized Turing machine [5469](#)
- Randomly branched chains [6844](#)
- Randomness [4072](#)
- Randomness space [254](#)
- Randomness test [255](#)
- Range identification [4772](#), [4773](#)
- Range of interactions [5035](#)
- Range voting [9954](#)
- Rank [703](#)
- contingency table (2×2) [1866](#)
 - contingency table ($m \times n$) [1867](#)
 - definition [6308](#)
 - matrix [1866](#)
 - subdeterminant [1868](#)
 - submatrix [1868](#)
 - table [1866](#)
- Rank and degree dependence [1868](#)
- Rank-based tests [6254](#)
- Rank correlation [6255](#)
- Rank-one attractors [964](#)
- Rank-one transformations [3061](#)
- Rank-ordered multifractal analysis (ROMA) [8541](#)
- Rank-size distribution of cities [7957](#)
- Rank-size rule [180](#), [1051](#), [1053](#)
- Rank tests [6255](#)
- Ranked pairs procedure [9952](#), [9956](#)
- Rankine–Hugoniot equation [4717](#)
- Ranking [7753](#), [7754](#), [7765](#), [8240](#)
- Rao–Blackwellization [8221](#), [8230](#)
- Rapid burster [392](#)
- Rappture [5761](#)
- Rare event [6996](#), [7002](#)
- Ratchet [1754](#), [1755](#), [1758](#), [1760](#), [1768](#), [1771](#), [1772](#)
- Ratchet effect [6985](#)
- Rate constant [1312](#)
- Rate equations [728](#), [1314](#), [6128](#)
- elementary steps [1314](#)
- Rate function [5999](#), [6002](#), [6009](#), [7523](#)
- Rate-limiting step [1316](#)
- Rate models [6100](#)
- Rate of reaction [556](#)
- Rate parameter [8308](#)
- Rate, firing [6100](#)
- Rate/state variable friction law [657](#)
- Ratings summation [9954](#)
- Rational bubbles [3413](#)
- Rational choice [8188](#)
- Rational expectation [209](#), [4972](#)
- Rational map
- isomorphism theory [4992](#)
 - of the Riemann sphere [4985](#)
- Rationality [1520](#), [8381](#), [8662](#)
- coalitional [1521](#)
 - group [1520](#)
 - individual [1520](#)
- Rationalizable strategies [1590](#)
- Rationing method [1675](#)
- random priority [1676](#)
 - uniform gains [1676](#)
- Rationing, problem [1675](#)
- Ratner's, property [8569](#)
- Rattlers [2834](#)
- Raussendorf [7257](#)
- Rawlsian maximin criterion [3332](#)
- Ray tracing [5472](#), [5473](#)
- Rayleigh–Bénard convection [6195](#), [6198](#), [6199](#), [6202](#)
- Rayleigh–Bénard experiment
- stochastic processes [3575](#)
- Rayleigh–Bénard system [3647](#)
- Rayleigh number [3626](#), [6195](#), [6198–6200](#)
- Rayleigh oscillator [5725](#)
- Rayleigh–Plesset equation [6959](#)
- Rayleigh–Ritz theorem [59](#)
- Rayleigh–Schrödinger [6726](#)
- RS perturbation theory [6726](#)

- Rayleigh's monotonicity principle 1406
 RBF kernel 5355
 RCP 5014, *see* Rotating circle property
 RD chip 9708, 9709
 RDF (resource description framework) 8085
 RDF/XML syntax 8092
 RDF(S) (RDF schema) 8085
 RDS 6469, 6471
 Re-focusing
 quantum information processing 7389
 Reachability 761, 8236
 >-Reachable 6036
 Reacting matching pairs 889
 Reaction center 1322–1324
 agostic bond 1324
 Local chemical composition 1326
 Reaction channel 8733
 Reaction constant 885
 Reaction-diffusion 525, 536–540, 543, 545, 1056, 7579
 Nieuwkoop center 538
 Reaction-diffusion chemical computer 5475
 Reaction-diffusion computing 278, 284, 3348, 3357
 Reaction-diffusion equation 284, 948, 6230, 6465
 Reaction-diffusion process 885
 Reaction-diffusion system (RDS) 118, 647, 3365, 4921, 6195, 6204, 6461, 9708
 Reaction front 885
 Reaction kinetics 7565
 in fractals 7566
 Reaction-limited 3368
 Reaction-limited CCA (RLCA) 3884
 Reaction network 328
 as example for artificial chemistry 327
 Reaction order 329, 7571
 Reaction propensities 8733
 Reaction rate 885
 Reaction rule as building block for AC 328
 Reaction site 1326
 agostic bond 1324
 Local chemical composition 1326
 Reaction zones 3368
 Reactive agents 188
 Reactive approaches 5792
 Reactive oxygen species (ROS) 483
 oxidative stress 483
 Reactivity 187
 Real biological fractals 3788
 Real estate 3126
 Real Ginzburg–Landau equation 395
 Real networks 1202
 Real options 7839
 Real-time 3243
 Real-time monitoring 8003
 Real-time seismology 2511
 Real typologies 8996
 Real-valued Turing machine 5469
 Realism 9062, 9064
 Realization
 input-output map 6375
 paracompact manifold 6376
 state space 8757
 Realization theory 6371, 6375
 Realized bipower variation, estimation of the square-tump quadratic variation component 8789
 Realized volatility
 definition 8787
 discretization bias 8788
 estimation and specification of SV models 8808
 ex-past vs. ex-ante measures of volatility 8789
 Heterogeneous auto regressive model 8789
 high-low price range estimator 8789
 long-memory 8789
 market microstructure noise 8788
 model-free ex-ante forecasts of volatility 8789
 short definition 8783
 unbiased and consistent estimator of the return quadratic variation 8788
 Rearrangement, matrix 8268
 Rebound release 2653
 Recapitulation theory 1918
 Receptive field 3335, 3344, 3345, 3347, 3351
 Receptors 724
 Recession 2746, 2748, 2752, 2754, 3301
 economic 3307
 end 3308
 start 3308
 Recharge 2612, 2613
 Reciprocal 7467
 Reciprocal causality 1538
 Reciprocity 6004, 6007, 8324, 10061

- Recognition 10032
 of faces 8938
- Recognition memory 2315
- Recombinant DNA 418
 polymer physics 6814
- Recombinant inbred (RI) 9118
- Recommendation 1589
- Reconfigurable device 930
- Reconfiguration
 off-line 5872
 on-line 5872
- Reconfiguration algorithm 5618
- Reconnection 9273
- Reconstruction 5535, 5538–5540, 5549
 or knowledge base 5538
- Record dynamics 7025, 7583, 7589
 intermittent dynamics 7025
 nested hierarchical 7587
 subordinated 7589
- Record statistics 7583
- Recording damaging ground shaking 2511
- Recovery 3114
- Recruitment
 discontinuous 1557
 discrete 1557
- Rectified diffusion 6956, 6958, 6964, 6969
- Rectified heat transfer 6964, 6972
- Recurrence 3041, 7522, 8488, 9225
- Recurrence plot 8000, 8003
- Recurrence theorem 2935
- Recurrent 5460
- Recurrent neural network 288, 1822
- Recurrent random walk 1396
- Recursion coefficients, multiwavelet 5844
- Recursion relation, multiwavelet 5844
- Recursive 3546
- Recursive decomposition 8272
- Recursive Fourier sampling 7092
- Recursive function 281, 287
- Recursive Greens function 8603, 8605, 8608
- Recursive neural networks 2149
- Recursive partitioning (RP) 2166
- Recursive state 8036
- Recursive structure 7626
- Recursive zero-sum game 4862
- Recursively computable 5468
- Recursively generated objects 119
- Red bonds 3705, 3709, 3853, 3854
- Red digital camera 10006
- Redistribution of energy levels 7149
- RED_{PCT} 7769
- RED_s 7772, 7773
- Reduced density matrix, quantum mechanics 7374
- Reduced distribution functions 994, 995, 998
- Reduced Euler–Lagrange equations 5495
- Reduced form 214, 5179
- Reduced graph 6245
- Reduced phase space 2264
- Reduced space 5483
 symplectic 5486
- Reduced system 6311
- Reducibility 5081
- Reduct 1793, 1794, 4417, 7756, 7761, 7769, 7793, 8338
- Reduction 6311, 6316, 6320, 6761, 7137, 8248, 9105
 at zero 5500
 Lagrangian 5495
 Liapunov–Schmidt 6609
 multisymplectic 5498
 nonequivariant 5490
 of dynamics 5488
 of geometric structures 5497
 semidirect product 5496
 singular 5497
- Reduction lemma 5488
- Reduction principle in stability theory 945
- Reduction process 9412
- Reduction theorem 942
 remarks on 5489
 symplectic 5487
- Reduction theory
 definition 5483
 historical overview 5492
 symplectic 5483, 5484
- Reductionism 202, 1538
- Redundancy 1720, 5871
 cascaded triple modular (CTMR) 5873
 hardware 5872
 information 5872
 R-fold modular 5873
 time 5872
 triple modular (TMR) 5873

- Redundant bond 2830, 2835, 2837
 Redundant edge 6014, 6016
 Redundant feature 5349
 Redundant manipulators 1476
 Reed–Muller expansion 9720
 Reentry 1427
 Reference frame 3860, 6426
 Reference mode 9044
 Reference plane 58
 Reference set 4061
 Referential 4061
 Referential meaning 1902
 Refinable function 592, 6864
 vector 5843
 Refinement equation 592
 multiwavelet 5844
 Reflection coefficient 4966
 Reflection symmetry 6633
 Reflective judgment 1893
 Reflex 1902, 6069
 Refraction diagram 9632, 9636
 Refractory period 1354
 Regeneration times 7524
 Regenerative amplifier 6124
 Regenerative gain 6125
 Régime 1550
 Regime shifts 3
 Regime switching 3443, 7021
 Regime-switching models 2745–2747, 2755
 Regiment (programming language) 262
 Region
 closed 6607
 compact 6605, 6606
 Hill 6604, 6605, 6607
 nonsimply connected 6607
 with boundary 6606
 without boundary 6605
 Regional catalogues 2565
 declustering 2565
 residuals 2566
 Regional climate models 7592
 Registration 10032
 Regression matrix 57
 Regular 703
 Regular domain 3233, 3237
 Regular equivalence 8289
 Regular language 5634
 Regular lattice 3847
 Regular perturbations 6738
 Regular point
 reduction theorem 5489
 symmetry algebra 5487
 Regular potential, Gibbs property 6947
 Regular semigroups 8297
 Regularity rules 2794
 Regularized long-wave (RLW) equation 8116
 Regularly varying 7012
 Regulation 719, 5407, 9105
 of gene expression 719
 Reif 5472, 5473
 Reinforcement learning 1816, 5195
 policy 5202
 punishments 5202
 Q-learning 5202
 rewards 5202
 Reinforcing effect 1977
 Relation 9228
 Compton 3874
 definition 6301
 median 9950
 transitive 9229
 Relation instance 4314
 Relational data model (RDM) 4305
 foreign key 4307
 primary key 4306
 relation 4306
 tuples 4306
 Relational databases (RDBs) 8089
 Relational feature selection 5358
 Relational granulation 8339
 Relational GrC model, fifth GrC model 4346
 Relative coordination 1541
 Relative dispersive analysis 479
 long-term memory 484
 Relative entropy 6941
 ergodic theory 6948
 Relative equilibria 2264, 4535
 n-body problem 5961
 Relative intensity (RI) 2441
 Relative location SDCA model 8830
 Relative majority 9947
 Relative permeability, porous medium 4957
 Relative phase 1553, 5720, 8200, 8201, 8204
 Relative reducts 1795

- Relatively finitely determined factor
isomorphism theory 4993
- Relatively very weak Bernoulli factor
isomorphism theory 4993
- Relativistic shocks 27
- Relativity 3859
doubly-special 3869
scales 3863
special scale 3868
- Relaxation 2694, 9732
- Relaxation methods 3745
- Relaxation modulus, single chain dynamics 6821
- Relaxation oscillation 566, 6129, 6156
- Relaxation phenomena 5672
- Relaxation processes 5673
- Relaxation time 6847, 6959, 9732, 9790
biological fractals 3794
- Relaxation time approximations 5915
- Relaxation time spectrum 6546, 6553, 6554
- Relaxational dynamics 3371
- Relay systems 6698
- Relevant and irrelevant nodes 600
- Relevant parameters 8544
- Reliability 4186, 8067
algorithm 4186
- Relication origins 3908
- ReliefF 5353
- Religious cults 3216
- RELM test 2444
- Remainder 6659
- Remaining benefit 1664
- Remote computation, difference to mobile computing 5605
- Remote evaluation 5607
- Remote ion-ion entanglement, quantum computing 7244
- Remote method invocation (RMI) 5607
- Remote visualization 2363
- Remotely operated vehicles (ROVs) 3688
- Remoteness Δ 9950
- Remove the degeneracy 2265
- Renegotiation 4798
- Renewal models 2563
- Renewal process 9837
gamma 9838
Gaussian 9838
likelihood 9837
- log-logistic 9838
lognormal 9838
mixture of Weibull 9839
power-law 9839
tests 9837
Weibull 9838
- Renormalization 1396, 1409, 2023, 3847, 3925, 6233, 6666, 7829
polymer physics 6811
- Renormalization group (RG) 1134, 1270, 1932, 5021, 5024, 6663, 6669, 6671, 7020, 7344, 8388, 8713, 9680
cusp singularity 1134, 1135
flow 1134
functional 1134
- Renormalization group (RG) methods 7347
coupling constants 7347
fixed point 7348
numerical renormalization group 7347
renormalization flow 7349
running parameter 7347
scaling 7347
- Renormalization group (RG) technique 8711
- Renormalization theory 6664, 6671
- Rényi, Alfréd 8277
- Repast, simulation tool 194
- Repeated game 1594, 2216, 4096, 7651
complete information repeated game 7655
finitely 7618, 7620
imperfect monitoring 7654
incomplete information repeated game 7656
model 2216
no discounting 7618, 7619
perfect monitoring 7653
with discounting 7618, 7619
with imperfect monitoring 1594
with incomplete information 1594
- Repeated prisoners' dilemma 4100
- Repeller 989, 1001, 5721
- Repellor 8423, 9225, 9233
- Repetition 2244
- Repetitive DNA 4164
recombination 4167
- Replica symmetry breaking 4224
- Replica theory 2020
- Replication 3894, 5612
- Replication domains 3913, 3915, 3917

- Replication origin 3904, 3910, 3913–3916, 3918
 Replication terminations 3913
 Replication timing 3913, 3914, 3916
 Replicator 3189, 3208
 Replicator dynamics 1595, 5678, 5683
 Replicator equation 2908, 6643
 Replicon 3908, 3909
 Replicon model 3914
 Repose time 9831
 Representation 4895, 6736
 CAR 3078
 equivalent 6736
 inequivalent 6736
 irreducible 6736
 Koopman 8555
 Maruyama 8567
 measure-preserving 8557
 of the center manifold 939
 reducible 6736
 unitary 8556
 Representation theorem (RT) 4014, 4065
 Representation theory 7100, 8935
 Representationalism 1111
 minimum robust representationalism 1109
 Representationww system 244
 Representative agent 205, 6807
 Representative chromosome 4154
 Representativeness 7850
 Repressilator 563
 Reprojection method 8789
 Repulsion between hubs 3934
 Reputation 8135
 Reputation bound 7657
 Reputation effects 4096, 7651
 Required number of large 1-itemsets (RNL) 4155
 Required reserve ratio 2807
 Requisite complexity 8370
 Requisite variety 8370
 Rescaled-range analysis 3760
 Réseau-Lu 1256
 Reservoir performance 6568
 Residual degeneracy 6735
 Resilience 1881, 3935, 8040
 Resilient propagation (Rprop) 1820
 Resistance 3854, 3936
 to change 7841
 Resistor network 3738, 6546, 6559
 conductance exponent 3744
 Kirchhoff's law 3740
 maximum voltage 3747
 optimal defects 3748
 random 3739
 Resolution 1697, 3860
 identity 4065
 matrix 9190
 Resonance 17, 21, 2265, 4516, 5076, 6102, 6312, 6313, 6316, 6322, 6461, 6462, 6474, 6613, 6628, 6655, 7663, 8635
 sporadic resonance 6188
 Resonance broadening 8529
 Resonance condition 6591
 Resonance line form function 8594
 Resonance of a fluid-filled resonator 9900
 Resonance overlap 384, 408
 Resonance phenomenon 7290, 9994
 Resonance relation 6179, 6188, 8641
 Resonance tongue interaction 2338
 Resonance tongues 2327, 6630
 Resonance-type effect 9981
 Resonant 6437
 Resonant acceleration 37
 Resonant (critical) phenomenon 9981
 Resonant frequency 6959, 6962
 Resonant monomial 6761
 Resonant motion 6670
 Resonant normal form 6715
 Resonant perturbation theory 6678
 Resonant scalar monomial 6188
 Resonant scattering 23, 31
 Resonant tunneling 7405, 8611
 Resonant zone 5988
 Resonator
 eigenmodes 6124
 quality factor, Q 6124
 Resources 1978
 corporate 7840
 space-like 6398
 usage 6401
 Respondent driven sampling 8214, 8219
 Respondent (or classical) conditioning 1886
 Response complexity 4106
 Response functional 3370, 3372
 Response to influences, agent actions 188

Rest point 8634, 8635
 nondegenerate rest point 8635
 Resting tremor 627
 Restoration 10032
 Restricted orbit equivalence, isomorphism theory 4992
 Restricted three-body problem 6428, 6438
 Restriction 8710, 8724
 enzymes 2098
 property 8724
 Result
 dynamic game 2218
 stochastic game 2218
 Resummation 1941, 6664, 6669, 6671
 resummed series 1942, 6671
 Resynchronization 637
 Retail trading 5409
 RETAIN 1804
 Retard diffusion 8316
 Reticular brainstem neurons 7994
 Reticular rhythm 7994
 Retrieval of cases 1804
 RETRIEVE 1804
 Retrograde evolution 5663
 Retroviruses 9751
 Return autocorrelation 103
 Return interval 3714, 3716, 3718, 3771
 Return map 776, 8632, 8638
 Return method 1506, 3530
 controllability 4816
 Return predictability 3449
 Return process and no-arbitrage condition,
 canoncial decomposition for special
 semi-martingales 8786
 Return time map, isomorphism theory 4991
 Return times
 ergodic probability measure 3021
 Returns 5420
 on investment 1978
 REUSE 1804
 Reusing 1805
 Reuters 5409
 REV (representative elementary volume) 2678
 Revelation game 9656
 Revelation principle 4792, 6984
 Revenue equivalence theorem 6986
 Reverse auction 2085

Reverse fault 9614
 Reversibility 64, 70, 820, 880, 1885, 1903, 7679,
 7696, 8033
 Reversible 6318, 6325, 6628
 Reversible CA 837
 Reversible computing 7089, 7090, 7366, 7680,
 7696
 Reversible logic gate 9130
 Reversible logic, quantum computation 7378
 Reversible SDCA 8833
 Reversible systems 2330
 Reversible Turing machine 5469
 Reversing 4188
 REVISE 1804
 Revision protocol 3176, 3181, 3182
 Revisionist economic models 2285
 Rewiring 5659
 Rework 1848
 Rework cycle 1846, 1851
 Rewriting systems 905
 Reynolds equation 3650
 Reynolds number 3643, 5576, 6195–6197
 Reynolds stress 3650
 Rheology 5017, 6959, 9771, 9777, 9785
 Bingham 9777
 Newtonian 9774, 9777
 non-Newtonian 9774
 of gels 6552
 of supercooled liquids 4237
 ρ -Hyperbolic 946
 Rhyolite 9796
 Rhythm 6099, 6107, 6109, 6110, 8200
 Riccati equation 1505, 6617, 8620
 Richness 5183
 Ridge 1722
 function 1722
 Ridgelet transform 1719
 fast slant stack 1723
 local 1724
 orthonormal 1722
 rectopolar 1720
 Ridgelets 1719
 Riemann invariants 9986
 Riemann–Liouville operator 5220
 Riemann mapping theorem 8710, 8717–8719,
 8721, 8724
 Riemann problem 4717, 9743

- Riemann solver 9743
 Riemann sum, definition 6299
 Riemann theorem 8720
 Riesz M-wavelet basis 590
 Riesz wavelets 597
 RIF (rule interchange form) 8085
 Rigged Hilbert space 989, 1004
 Right closing factor code 8895
 Right-equivalent 703, 709
 Right invariant system, input-output mapping 6377
 Right multiplication table 8295, 8300, 8301
 Right resolving factor code 8895
 Rights, property 4624
 Rigid cluster 2836, 2839
 Rigid region decomposition 6014, 6018, 6020
 Rigidity 9585, 9776
 in gels 2833
 polymer physics 6815
 problem 2838
 transition 2830
 Rigidity percolation 6546, 6557
 Ring 703, 778, 7673
 Artinian 790
 commutative 779
 directly finite 779, 789
 group 779, 788
 oscillator 563
 stably finite 779, 789
 systems 6445
 zero divisor in a 779, 788, 790
 4-Ring 8258
 RISC 5883
 Rising 4188
 Risk 3110
 neoclassical economics 178
 Risk analysis 1860
 Risk assessment 1848, 1860
 Risk aversion 3470
 time-varying 3471–3473
 Risk aversity 3328
 Risk communication 3110
 Risk dominance 3195
 Risk dominant equilibrium 3196, 3197
 Risk estimation 3718
 Risk management 7010
 Risken 8932
 Risky assets 5400
 Rivalry, binocular 6108
 River restoration 9021
 Rivers 3700
 RLP 5014
 RLW equation 87
 RMI *see* Remote method invocation
 RNA 418, 2098, 4172
 editing 4171
 hnRNA 4169
 interference 3971
 miRNA 4172
 mRNA 4171, 4172
 mRNA (messenger RNA) 4169
 nonsense-mediated decay 4171
 piRNA 4173
 siRNA 4173
 snRNA 4169
 world 3286, 3291, 3298
 Road pricing 9460
 Road theorem 8901
 Road traffic 5440
 Roadmaps 5785
 Roadwork planning 9526
 Robbins–Monro algorithm 6007
 Roberts theorem 5518
 Robocode 4139, 4143
 Robot control 9705
 Robot design 2074, 4647
 Robot evaluation 4650
 Robot-room 1480
 Robot sensors 4646
 Robotic networks 7720, 7725, 9105
 Robotic wall 1481
 Robotics 1110, 1346, 1897, 2073, 8872, 8873
 and amorphous computing 269
 assistive 4648
 developmental 4648
 educational 4649
 epigenetic 4648
 humanoid robots 1109, 1121
 modular 5621
 socially assistive robotics 4648
 Robots 1110, 1897, 4644
 autonomous 6067
 self-reconfigurable 5619
 Robust 2846, 2848

- Robust control 45
 Robustness 565, 731, 3935, 4676, 4725
 resilience 6058
 vulnerability 6058
 Robustness under incomplete information 4800
 ROC diagram 2445
 ROC graph 1998
 Rock 6505, 9874
 discrete discontinuities 6505
 Rock–Paper–Scissors games 3179
 Rod networks 2833
 Rodent homeodomain, entropic profile 500
 Rogers, Everett 8272
 Rogue advertising profiles 4374, 4375
 Rogue trader risk 5410
 Rokhlin’s lemma 2975, 3058
 Rokhlin’s theorem 4986
 Role 8289
 Role algebra 8273, 8292, 8295, 8297, 8302
 Role autonomy 8195
 Rolle differentiation 6298
 Romania 2399
 Romanovsky theorem 6243
 Root-mean-power (RMP) 228
 Root-mean-square 228
 Rosenau, P. 88
 Rotary element 7702
 Rotated l-shaped mapping 3562
 Rotating circle property (RCP) 5964
 Rotating spiral pattern 9718
 Rotating Stäckel potential 403
 Rotation
 of a compact group 2958
 quantum mechanics 7372
 Rotation effects 2636
 seismic 2637
 Rotation matrix 1017
 Rotation motions, spin and twist 2641
 Rotation number 1935, 3021
 best approximant 1939
 Rotational dynamics 387
 Rotational ground motions 2524
 Rotational motion 6446
 Rotational seismology 2523
 Rothblum index theorem 6246
 Rothmund 5479
 Rotor 6634, 6636
 Rotor dynamics 6634
 Rough binary relation 7767
 Rough entropy 7732
 Rough functional dependency 7736
 Rough inclusion 1797, 4413
 Rough relation entropy 7733
 Rough relational database 7730
 indiscernibility 7730
 Rough schema entropy 7733
 Rough set 4403, 7753, 7788, 7790, 8338
 contingency table 1865
 Rough set system 4358
 Rough set theory 1791, 1792, 4314, 4355, 4412,
 7729, 7755
 classical 7755
 Rough stress field 5029
 Roughening exponent 2024
 Roughening transition 3372
 Roughly-redundant 7734
 Roughness 3841, 7732, 7790
 Roughness exponent 2022
 Roulette wheel selection 4874
 Round numbers 5415
 Round-off error 8993
 Rouse-chain motion 6824
 Rouse dynamics 6821
 Rouse local-dissipation theory 6812
 Rouse matrix 6847
 Rouse theory 6847
 Rouse time, single chain dynamics 6820
 Rousseau 1883
 Route guidance 3955
 Routes to chaos 3647
 Routh–Hurwitz criterion 8636
 Routh reduction, nonabelian 5496
 Routh, work in reduction theory 5492
 Routhian 5496
 RSA public-key cryptosystem 7382
 RSES package 1799
 RT *see* Representation theorem
 Rubber elasticity theory, entangled polymer
 dynamics 6821
 Rubber elasticity, polymer physics 6813
 Rubel 277, 286, 3357
 Ruderman–Kittel–Katsuya–Yoshida (RKKY)
 interaction exchange 7353, 9651
 Rudolph structure theorem 4988

- Rudolph's counterexample machine 4989
 Ruelle inequality 960
 Ruelle–Pollicott resonances 1003, 1004
 Ruelle's Perron–Frobenius theorem 6948
 Ruelle's pressure formula 3019
 Rugged energy landscape 1129
 Rule
 Leibniz 3872
 probabilistic 1865
 Rule 90 66, 72
 Rule based systems 1343
 Rule component 65
 Rule discovery method 1865
 Rule induction 1993, 7798
 Rulebases
 fuzzy 4080
 type 1 fuzzy logic 4083
 Rules supernetworks 6035
 Run-length-limited shift spaces 8902
 Runaway 5032
 Runge–Kutta 8697
 Running couplings 6665, 6671
 Rupture 3622, 3639
 Rupture area 2483
 Rupture duration 2479, 2482, 2487, 2492
 automatic estimates 2491
 Rupture evolution 7860
 Rupture length 2483, 2485
 Rupture model 2485
 Rupture process 2482, 2489, 9581
 Rupture slowness estimation, tsunami warning 2669
 Rupture velocity 2485, 2486, 2488, 2593
 earthquake 2539
 Russell, John Scott 81, 1376, 6138, 8113
 Rüssmann 5079
 non-degeneracy condition 5081
 RV 8787
 RWRE 7521
 Rényi, Alfréd 2867
- S**
- S-Bots 3692
 S-Coda waves 7915
 S-Matrix 7672
 s-Norm 4067
s-t-Norm composition of two fuzzy relations 4069
 S-Unit theorem 3049
 S wave 2476, 2478
 S-wave 2664
 Sabatier principle 1314
 SAC 2405
 Saccharomyces cerevisiae 483, 9108
 continuous culture 483
 SAD seasonal affective disorder 3457
 Saddle 2265, 4522
 Saddle-node 6633
 Saddle-node or limit point bifurcation 4536, 5304, 5728
 Saddle point 1312, 4855, 6623
 Saddle point criteria 4858
 Saddle point theorem 6623
 Saddle potential, Paul trap 7221
 Saddlepack 2077
 Safe languages 5611
 Safe shelter 3134
 Safety learning 5203
 Saidani 8842
 Sales force 7846, 7848
 Salmon population 9015
 SALSA 5275
 Sample selection 5557
 censoring 5553
 self-selection 5557
 truncation 5557
 two-step Heckman procedure 5558
 Sample-spanning cluster 6542, 6544
 Sampling
 critical 1721
 design 8213, 8215, 8216
 sample size 1990
 theorem 1721
 Samy worm 4369
 San Andreas fault 2612
 San Fernando basin 9194
 P wave velocity model 9194, 9195
 SCEC model 9194
 San Fernando earthquake 9194
 Sandbody 6570
 Sandbox method 3709
 Sandbox security model, Java 5611
 Sandboxing 5611
 Sandpile 8029

- Sandpile cities 7968
 Sandpile model 1135
 SANS *see* Small angle neutron scattering (SANS)
 Santa Fe approach 212
 Santorini 9799
 SAR 2114, *see* Socially assistive robotics
 SAR research 4649
 Sarcolemmal K_{ATP} channel 480
 SAT-property, random walk 3077
 Satellite altimeters 9635
 Satellite positioning 4251
 GPS signal 4252, 4277
 integer ambiguity 4252
 Satisfaction relation 4394
 Satisfiability problem 2094
 Saturable absorber 6137
 Saturable absorption 6139
 Saturation 2474, 2477, 2482, 2484
 principle, non-standard analysis 6305
 spectral saturation 2484
 time-window 2484
 Saving propensity 2808
 Saw-tooth pattern 7033
 Scalability 1141
 Scalar solitons 1376
 Scale 3860, 6669
 kinetic 9728
 macroscopic 9728
 microscopic 9728
 minimal 3869
 of representation 9727
 Planck 3860, 3869
 stochastic processes 3589
 Scale coupling 5917
 Scale disorder 3575
 Scale-free 2875
 Scale-free distribution 8277
 Scale-free law 4835
 Scale-free model 6049, 6051
 Scale-free networks 570, 575, 1050, 2715, 3856,
 6048, 6050, 6496, 6787, 8263, 8912
 Barabási and Albert 6051
 heterogeneous 6050
 hubs 6050
 Scale-free property 3924
 Scale-free structure 3214
 Scale index 6671
 Scale invariance 725, 1682, 3700, 3802, 3879,
 7012, 7568, 8710, 8712
 Scale-invariant quantity 5022
 Scale separation 4906
 Scale transformation 312
 Scalegram, wavelet power spectrum 378
 Scaling 271, 277, 282, 320, 476, 1049, 1050, 1126,
 1642–1644, 1646, 1648, 1657, 2019, 2821, 3865,
 6410, 6608, 6777, 7826, 8266, 8268, 8712, 8713,
 8718, 9692, 9785
 agent-based modeling 152
 in equilibrium 8712
 linear 1644, 1648
 scale free 478, 486
 self-similarity 478
 Scaling behaviors 603
 Scaling dimension 2024
 Scaling exponent 3755, 3759, 3768, 6998, 9687
 Rényi 3768
 Scaling factor 6669
 Scaling function 1721, 6862, 6998, 8713
 Scaling idea 8712
 Scaling laws 2442, 2581, 3755, 5028, 6543, 6664,
 8713
 near the gel point 6562
 of earthquakes 2581
 of seismic spectrum 2588
 Scaling limit 6526, 8710, 8714
 Scaling methods 8266
 Scaling models 8274
 Scaling relations 6773
 scaling laws 6777
 Scaling result 5028
 Scaling structure, polymer physics 6818
 Scaling universality class 8711, 8716
 Scalloping 1898
 Scalogram 2672
 Scar 1008, 7167
 Scarabotti F 780, 784
 Scarce resource 6492
 Scattered data fitting
 discrete least squares fitting 5800, 5817, 5818
 L_1 spline method 5817
 L_1 spline methods 5822
 minimal energy method 5817
 penalized least squares fitting 5817, 5821

- Scattering 4962, 6740, 7663
 amplitude 6741, 6742
 coefficient 4966
 data 4960, 4962, 4966, 4968, 4969
 length 8593, 9681
 matrix 8600, 8608, 8609
 potential 6741
 slab 7924
 solutions 6741
- SCD *see* Social coordination dynamics (SCD)
- Scenario 235, 240, 1859, 1860, 1970
 base-run 7843
 compound 240
 computed 7832, 7848, 7850
 decision 7836, 7839
 diagrams 7044
 environmental 7839
 growth 7842
 homogeneous 240
 mixed environmental 7836
 pollution 7845
 risk 1860
 tourism growth 7843
- Scenario-driven planning 7849
- Schaeffer 704
- Schawlow–Townes limit 6143
- Scheduling 2093
- Schelling 6805
- Schelling model 1061, 6381
- Schema 4136
- Schizophrenia 4900, 7992, 7994
- Schlafkrankheit, effects of climate change 1101
- Schmeling–Troubetzkoy theorem 3024
- Schmitz–Schreiber method 3774
- Schnirelman’s theorem 1008
- Schramm Loewner evolution 8710
- Schramm’s theorem 8710, 8713, 8721
- Schrödinger cat state 7242
- Schrödinger equation 1309, 2041, 2042, 4961, 4963, 6689, 7403
 nonlinear 2050
- Schrödinger operators 5081
- Schrödinger picture 8927
- Schur’s lemma 6736
- Schwartz, Anna 2793
- Schwartz’s solution 9953
- Schwarzian derivative 3839
- Science gateways 5763
- Scientific progress, fuzzy logic 3988
- Scientific theories, fuzzy logic 4003
- Scientific thinking 4565
- Score system 9954
- Score vector 9947, 9960
- Scoring procedures 9947, 9955
- Scott, John 8269
- Scout 2000 2075
- Scrambled set 9237
- Screening 8127
- Screening cloud 9683
- Screening length 8579
 polymer physics 6812, 6817
- Scroll wave 6471
- SDCA and genetic algorithms 8832
- SDCA with memory 8835
- Sea ice
 ice dynamics 1708
 thermodynamic sea ice model 1709
- Seafloor deformation 9633
- Seamount 9587
- Search and rescue operations 1476, 3683, 3698
- Search control knowledge 5190
- Search-control rule 5197
- Search engine 10062
- Search engine bias 10066
- Search space 1835, 4135
- Searching on complex networks 6061
- Seasonal affective disorder (SAD) 3469, 3470
 clinical incidence 3471
 onset/recovery 3471
- Seasonality 7843
 tourism 7843
- Second laser threshold 6134
- Second law 4897
- Second law of thermodynamics 3084, 3270
- Second-order phase transition 3851, 5027, 6772, 6776, 8711
- Secondary extinction, network fragmentation 2735
- Secondary membership function
 fuzzy system models 4088
- Section
 Poincaré 6599
- Sector 2285
- Secular equation 7437

- Secular frequency, quantum computing 7221
 Secular term 6212
 Secure coprocessors 5612
 Security proofs
 approaches to security proof 7271
 classical post-processing protocol 7273
 classification of eavesdropping attacks 7270
 composability 7274
 security proofs of practical QKD systems 7274
 Sediments 9586, 9588
 Seed adopters 8315
 Segment 6841
 Segmentability 1527
 Segmentation 534, 536, 540–544, 10032
 Segregation 1061, 1062, 2819, 3368, 6483, 7572
 Segregation model 93, 210, 211
 Seismic 2450
 phase 2450
 stations 2452
 travel-times 2454
 velocity model 2453
 Seismic albedo 7918
 Seismic coupling 9588
 Seismic cycle 1219, 1690, 7863
 Seismic efficiency 2585
 Seismic energy 2479, 2483
 Seismic gaps 1695
 Seismic hazard 2396, 2438, 7853
 real-time 2396
 Seismic inversion 9585
 Seismic methods, earthquake source 2662
 Seismic moment 2396, 2478, 2481, 2582, 2650,
 5021, 9595, 9633, 10055
 scalar 2482, 2485
 small earthquakes 2546
 Seismic monitoring of magmatic and hydrothermal
 activity 9925
 Seismic network 2501
 Seismic nucleation phase 2546
 Seismic phases
 P-waves 2397
 S-waves 2397
 surface waves 2397
 Seismic phenomenon 1626
 Seismic potency 5021, 5022
 Seismic sensors
 accelerometer 2397
 seismometer 2396
 Seismic stations
 broadband 2400
 short period 2400
 strong motion 2400
 Seismic tomography 2692, 9172
 arrival-time 9179
 arrival-time tomography 9172
 checkerboard model 9191
 checkerboard test 9199
 comparison with X-ray tomography 9179
 decoupling of the earthquake location and
 tomography problems 9183
 examples 9194
 Fermat's principle 9182
 local slowness tomography 9182
 local velocity tomography 9181
 solution iteratively 9190
 solution roughness 9190
 teleseismic tomography 9186
 Seismic wave propagation 1215
 Seismic waves 1215
 Seismicity 1216
 Seismicity as a critical phenomenon 2625
 Seismicity parameters 2361
 Seismicity patterns 7854
 SeismNet manager 2403
 Seismo-electromagnetics 2622
 Seismogenic zone 10051–10056
 Seismogram 9877
 Seismograph 2475, 2477, 2481, 2500
 broadband seismograph 2477
 long-period 2481
 short-period 2481
 Seismometer 2475
 Selection 3278, 4103, 4135, 5999, 6009, 8317
 Selection bias 5554
 self-selection 5557
 Selection criteria 3215
 Selection operation 4150
 Self-affine fractal 3710, 3825, 3882
 Self-assembly 2096, 5478, 5893
 directed 5866
 molecular 5866, 5874
 origami-based 261

- Self-assembly after explosion 5628
 Self-averaging 7002
 Self-avoiding random walk 8710, 8713, 8726
 Self-avoiding walk 3707
 biological fractals 3786
 Self-calibrating intelligent sensors 3250
 Self-compression 9370
 Self-concept 1905, 8424, 8427
 certainty 8427
 self-esteem 8427
 self-structure 8427
 Self-consistency 1683
 stochastic processes 3585
 Self-consistent method 7482
 Self-consistent solution 7315
 Self-crossing random walk 8714
 Self-development 3243
 Self-efficacy 1905
 Self-employment 2285
 Self-energy 7666, 8602
 Self-energy clusters 6669
 Self-energy resummations 6671
 Self-evaluation 8425
 Self-exciting tar 3443
 Self-healing materials 1293
 ceramic matrix composite 1293
 polymer composites 1293
 Self-help 3111
 Self-inspection 8082
 Self-interacting chain, polymer physics 6815
 Self-maintenance of sets 337
 Self-modulation model 3816
 Self-ordering 3271
 Self-organization 284, 477, 1303, 1537, 1876,
 1879, 1886, 3349, 3358, 3859, 4593, 4895, 5723,
 6481, 7991, 7992, 7999, 8001, 8003, 8005, 8006,
 8011, 8040, 8067, 8198, 8200, 8206, 8366, 8420,
 8422, 8432, 8926, 8927, 8946
 and the city 7954
 complexity in time 3576
 Self-organization processes 627
 Self-organized 4921
 Self-organized branching processes 649
 Self-organized critical (SOC) system 3790, 7014,
 7584, 8711
 Self-organized criticality (SOC) 378, 392, 644,
 663, 888, 1135, 1899, 2875, 3795, 7996, 8029,
 8040, 8044, 8524, 8543, 8544
 forced 8523, 8543, 8544
 Self-organizing 5241
 Self-organizing communication system 7997
 Self-organizing criticality (SOC) 2562
 Self-organizing map (SOM) 1822, 2147
 Self-organizing spatiotemporal congested pattern
 1180
 Self-organizing systems 8040
 models 914
 Self-phase modulation 6139
 Self-presentations 7996
 Self-propulsion 549, 552
 Self-reconfigurable robots 1226, 8842
 Self-referential emotions 1905
 Self-replicating robotic 1226
 Self-replication 116, 1226, 8067
 computing machines 8067
 Self-reproducing cellular automata 3538
 Self-reproduction 5439, 7694, 8068
 Self-repulsion, polymer physics 6817
 Self-signaling 8132
 Self-similar 3848, 3861, 3931, 7827
 Self-similar approximants 6740, 6746
 Self-similar branching structures 3781
 Self-similar fractal patterns 67
 hierarchical iterated function systems 67
 matrix substitution systems 67
 Pascal triangle 67
 Sierpinski gasket 67
 Self-similar solutions 2592
 Self-similarity 2575, 3654, 3701, 3847, 3893
 biological fractals 3788
 Self-similarity measure 7436
 Self-sustained oscillations 8946
 Selfish DNA, mitosis 4163
 Selfish gene algorithm, applications 3240
 Selfsimilar structures, complexity 3576
 Selkov model 886
 Seltén game 437
 Semantic approach 432
 Semantic closure 341
 Semantic coordination variables 1559
 Semantic grid 8099
 Semantic information 7953

- Semantic model 4394, 4396, 4397
 Semantic order parameters 1559
 Semantic place map 2080
 Semantic synergistics 8929, 8939
 Semantic view 4341
 how-to-solve/compute-it 4341
 knowledge engineering 4341
 uncertainty theory 4341
 Semantic web 8084
 commercial applications of 8096
 Semantic web challenge 8095
 Semantics 352, 1533, 1534, 1536, 4392
 Semi-analytical methods
 homotopy analysis method (HAM) 8505
 homotopy perturbation method (HPM) 8505
 variational iteration method (VIM) 8505
 Semi-classical regime 1008
 Semi-conductor 8940
 Semi-dilute solution, polymer physics 6817
 Semi-endogenous sequential matching model 4111
 Semi-jets 6220
 Semi-local bifurcation 2265
 Semi-perfect equilibrium 4101
 Semi-realistic molecular structure 336
 Semi-supervised feature selection 5355
 Semialgebra 5453
 Semiclassical limit 6748
 Semiclassical methods 6749
 Semiconcave functions, Hamilton–Jacobi equations 4559
 Semiconcavity 4546
 Semiconductor barrier 7300
 Semicontinuous envelope 6223
 Semiconvexity 4546
 Semidecidability 816
 Semidirect product reduction 5496
 Semigroup 8273, 8292, 8293, 8295–8297, 8300, 8301
 Semilinear wave equation, controllability 4814
 Semiotics 3114
 Semiparametric estimators 5555
 informative bounds 5558
 Semiwalk 8250
 Senge, Peter 9046
 Sensation seeking 3457, 3470
 Sensitive dependence 9237
 Sensitive dependence on initial conditions 3506
 Sensitive initial conditions 3830
 Sensitive periods 1902
 Sensitive system 2234, 9250
 Sensitivity analysis 215, 4056, 5536, 5543
 Sensitivity of initial conditions 3843
 Sensitivity on initial conditions 954
 Sensitivity to initial conditions 382
 Sensor-based random trees 2081
 Sensor fusion 6073
 Sensor grids, distributed 5614
 Sensor network and amorphous computing 269
 Sensorimotor functioning 1901
 Sensory–motor coordination 1112
 Separable 1817
 Separable cost 1664
 Separation
 of time scales 3369, 6689
 of variables 5444
 Separation, six degrees of 8263
 Separatrices 4516
 Sequence 3256
 formulation-solution-implementation 7850
 mathematical function 6292
 Morse 8561
 Rudin–Shapiro 8561
 spectral 8555
 Sequence complexity 492
 Sequence entropy, DNA 495
 Sequence spaces
 coordinatewise operations 6291
 defintion 6291
 Sequencing, triggering of 266
 Sequential compactness, domain problem 2220
 Sequential computation 3356
 Sequential dynamical system 166
 Sequential equilibrium 1587
 Sequential exogeneity 2777
 Sequential feature selection 5358
 Sequential learning 1816, 1819
 Sequential machine, reversible 7701
 Sequential plan analysis 7995, 7997
 Sequential selection 5350
 Sequential time 279, 287
 Serial choice function 1681
 Serial correlation 2773
 Serial demand game 1678

- Serial dependence 6252, 9836
 Serial extension 1683
 Serial independence test 6253
 BDS test 6255
 Serial principle 1683
 Seriation 1904
 Series expansion 1031
 Serious games 1344, 8378
 Server, mobile system 5606
 Service industry dynamics 679
 Service oriented architecture 8439, 8440
 Service-oriented architecture 353
 Service robotics 4648
 SeSAM 189
 Set
 autocatalytic 337
 complete 7762
 critical 6600
 fuzzy 3986, 3988, 4009, 4011–4013, 6927
 fuzzy-fuzzy 4012
 intersection 4012
 interval 4013
 Kronecker 8566
 minimal 7762
 of analyticity 6768
 of decision rules 7762
 of k-recurrence 3090
 of probability measures 4049
 of recurrence 3087
 union 4012
 Set level 7790
 Set partitioning in hierarchical trees (SPIHT) 10036
 Set theory 8268
 Settle 3547
 Settling time 2247
 Seven steps to community safety 3126, 3138
 Seventh GrC model 4347
 Sexual contact 4660
 Sexual development 1905
 Sexual intercourse 1905
 Sexually transmitted infection 4660
 SFF *see* Special fuzzy functions
 SFF-LSE *see* Special fuzzy functions with LSE (SFF-LSE) method
 SFFM *see* >Special fuzzy functions models
 SGML (standard generalized markup language) 8091
 Shackle, G.L.S. 6928
 Shadow marketing 7833
 Shadow price 5536, 5543
 Shadowing lemma 4729
 Shadowing property 4729, 9248
 Shallow water 6206, 8505
 Shallow water theory 6210, 9634
 Shallow water wave and solitary waves 8123
 Shallow water wave equation 3617, 8117, 8118, 9985
 Shamir, Adi 5478
 Shannon 277, 2867, 3357, 5477
 Shannon–McMillan–Breiman theorem 4986, 6944
 Parry's generalization 3072
 Shannon–Nyquist sampling theorem 10044
 Shannon, Claude 285
 Shannon's entropy of information 4821, 6934
 Shannon's formula 1046, 1047
 Shannon's information theory 1302, 8936
 Shape
 asymptotic 4497
 asymptotic 4503
 fractures 6515
 linear 4503
 reverse 4505
 sublinear 4504
 Shape factor, polydisperse fractures 6513
 Shapley value 1509, 1510, 1514, 1515, 1662, 4095
 Shapley, L. 1510
 Shared entropy
 biological information 498
 Shared vision 9047
 Sharma–Tasso–Olver equation 6457
 Sharpe ratio 3462, 3464, 3468, 3469
 Shattered 5212
 Shear 1723
 matrix 1729
 Shear band 2649, 5002, 5007
 critical state 5002
 dilate 5002
 Shear mechanical topology 7039
 Shear viscosity 2682, 4387
 Shear wave 2476

- Shell models 8010, 8024
for MHD 8024
- Shetland 3132
- Shift-commuting transformations 66
- Shift dynamical system 66
- Shift equivalence 8898
- Shift homeomorphism 9238
- Shift map 4985
- Shift of finite type 8894
- Shift operator 65, 67, 5306
- Shift space 6949, 8892
ergodic theory 6943
- Shift transformation 5455
- Shifts 2959, 3244
Chacon system 2961
coded systems 2961
context-free systems 2961
Prouhet–Thue–Morse 2960
Sofic systems 2961
Sturmian systems 2961
Toeplitz systems 2961
- Shilnikov scenario 390
- Shinahr 3567
- Shinar 3559
- Shinkansen 2398
- Shinriki oscillator 3587, 3588
- Ship dynamics 6189
- Shipping market models 685
- Shock 21, 4713, 4716, 6472
- Shock absorbers 7040
- Shock drift acceleration 36
- Shockwave 6490
- Shooting method 2014, 7411
- Shor, Peter 1013, 7254
Shor's algorithm 7254, 7260
- Shor's algorithm 7382
- Short cuts 8277
- Short memory 2758, 2763
process 2758
- Short-range order 5903
- Short-term 1888, 1893, 1896, 1906
processes 1875
traffic prediction 9514
- Short time propagators 3580, 3582, 5243
estimation 3583
- Shortcut 8258
- Shortest path 6049, 10061
average 6053
diameter 6053
dimensions 3852
in a labyrinth 1356
problem 5471
- Shot noise 6143
- Shrinkage 8673, 10033
- Shub 279
- Shuffle product 1036
- Sideband cooling, quantum computing 7226
- Sideband excitation, quantum computing 7232
- Siegel 6664
- Siegel–Bryuno lemma 1941
- Siegel domain 8635
- Siegelmann 288
- Siegel's method 6666
- SIENA 6011
- Sierpinski carpet 3702, 3703, 7567, 7575
- Sierpinski gasket 3702, 3803, 3851, 3890, 7567, 7571, 7573, 7577
- Sierpinski lattice 1412
- Sierpinski sponge 3702, 3703
- Sierpinski triangle 5639, 5640
- Siersma's trick 713
- Sieve 3475, 3479
- Sigma-count, fuzzy logic 3991
- σ -Finite ergodic invariant measures, classifying 3077
- σ -Shells 7429
- Sigmoid 276
- Sigmoid function 1817
- Sign ambiguity 55
- Signal 800, 5869
token-based 5869
voltage-encoded 5869
- Signal identification, infrasound 4840
- Signal processing 2878
- Signal strength 2247
- Signal subshift 9257
- Signal-to-noise ratio 2247, 2483
- Signal transduction 724
- Signaling games 4096, 8126
- Signaling networks 484
amplitude-encoded 486
frequency-encoded 486
frequency filters 484

- high-pass filter 485
 low-pass filter 485
 Signed infinities, definition 6289
 Significance profile (SP) 5697
 Signs, series 3765
 Silica aerogel 2257
 Silicon nanowire field effect transistors 7480
 Sill 9881
 Silly putty 9813
 Šilnikov orbit 6637
 SIMD *see* Single instruction multiple data
 Similarity 4188, 4412
 Similarity dimension 3879
 Similarity matrix eigenvectors 7438
 Similarity relations 1796
 Simmel, Georg 8266
 Simon 3547
 Simple 6311, 6314
 Simple choreographies, minimizing properties 5974
 Simple mechanical system 2265
 Simple minority game without Information 5597
 Simple model 5024
 Simple random graph model 8321
 Simplicity 3216, 3218
 neoclassical economics 179
 Simplification
 over 7839
 unwarranted 7839
 Simplified 6315
 Simplified neuro-fuzzy systems 6091
 Simplify 6311, 6314
 Simpson's procedure 9956
 SimSesam, simulation tool 195
 Simulated annealing 278, 4913, 6574
 Simulation 281, 849, 1862, 1975, 2078, 4474, 5467, 6567, 7089, 7098, 8276, 8325, 8405, 9044
 agent-based modeling 184
 collision 330
 discrete-event 330
 molecular dynamics 151
 numerical 6105
 of quantum systems 7132
 role of environment 189
 Simulation-based methods 5554
 data augmentation 5557
 Markov chain Monte Carlo 5554
 maximum simulated likelihood 5557
 smooth 5557
 Simulation DTA tools
 contemporary 9444
 early 9444
 Simulation methods 692
 Simulation model 7842
 multi-agent 150
 Simulation modeling 4577, 7832
 Simulation universality 5439
 Simultaneous equations model (SEM) 5553
 Simultaneous localization and mapping (SLAM) 3688
 Sinai–Ruelle–Bowen (SRB) measure 954, 990, 1002, 6951, 6952
 existence of 961
 Sine-Gordon equation 84, 4962, 8475
 Sine-Gordon model 9686
 Single chain dynamics 6819
 Single-crossing condition 8128
 Spence–Mirrlees condition 8129
 Single dealer markets 5394
 Single digit counter 1370
 Single-electron device 9715
 Single-electron oscillator 9715
 Single-electron penning trap 7224
 Single-electron transistor 7309, 9715
 Single-electron tunneling 9645
 Single events 556
 Single force 9906
 Single instruction multiple data (SIMD) 153
 Single-ion operation, quantum computing 7227
 Single ion, quantum computing 7226
 Single-layer neural networks 1817
 Single-minimum-support fuzzy mining (SSFM) 4147
 Single-molecule biology 7029
 Single-molecule experiments 3607
 free-energy differences 3607
 optical tweezers 3607
 Single-molecule force spectroscopy 7032
 Single-molecule magnets 9652
 Single-molecule manipulation techniques 7028
 Single-molecule techniques 7029
 Single nucleotide polymorphisms (SNPs) 3974, 5536
 Single peak domains 5512

- Single photon sources 7261
 Single photon state 7262
 Single polymer chain physics 6813
 Single-qubit operation 7227, 7228
 Single transferable vote 9948
 Single transient behavior pattern 8961
 Single vehicle characteristics 9383
 Single-walled carbon nanohorn 691
 Single-walled carbon nanotube 691
 Single well potential 6753
 Single, error correction 7243
 Singlet state, quantum weirdness 7375
 Singleton basins of attraction 6043
 Singular hamiltonian systems 5961
 Singular perturbation problem in U (SP-problem) 6704
 Singular reduction 2265, 5497
 mechanical systems 5488
 Singular trajectories 5449
 Singular value decomposition 3766, 8352
 of a matrix 9183
 Singular variable, fuzzy logic 3992
 Singularity 61, 703, 1720, 3893, 3897
 analysis 8538
 and symmetry 5487
 focus-focus 7140
 lines 1720
 point 1720
 spectra 8538
 spectrum 3894, 8539
 theory 4533
 Sink problem 5271, 5277
 Sinusoidal forcing 7609
 Sipper, Moshe 925
 SIR *see* Susceptible-infective-removed (SIR)
 SIR model 4660
 Sir Philip Sidney game 8136
 SIRN – synergetic inter-representation network 7953
 Site 7822
 Site-bond correlated percolation 1604
 Site effects 4436, 4439, 4458
 asperity 4450
 bedrock motions 4458
 crack propagation 4450
 directivity 4450
 dynamic rupture modeling 4452
 effects of local site conditions 4437
 energy and the energy radiated by seismic waves 4450
 high-frequency seismic radiation 4451
 hypocenter location 4450
 kinematic source parameters 4452
 liquefaction effects 4462
 local directivity effects 4450
 local sedimentary cover 4436
 local slip-velocity function 4450
 new crack surface (fracture energy) 4450
 nonlinearity 4454, 4458, 4462
 nucleation phase 4451
 propagating crack tip 4450
 representation theorem 4453
 rupture velocity 4451
 self-similarly expanding crack model 4452
 site-amplification 4458
 site-correction factors 4461
 slip distribution 4450
 slip-velocity function and rise time 4452
 soil classification 4459
 source-site geometry 4463
 strong geologic contrasts 4436
 strong topographic effects 4456
 super-shear speeds 4452
 temporal rupture evolution 4450
 topography 4436
 water-table variations 4436
 Site percolation 6539, 6541, 8726
 model 8714
 Situated ABM approaches 189
 Situatedness 2845
 Situation
 assessment 8442
 competitive 3151
 formulation 7850
 nature 7841
 normal 3151
 structure 7841
 Situational calculus 1347
 Sixth GrC model
 categories of function 4347
 generalized function 4347
 random variable 4347
 Size-consistency 6735
 Size distribution 6573

- Size-predictable 9842
 Size quantization 7405
 Skeleton 2681
 Skew-adjoint, state linear systems 6379
 Skew DNA walks 3904, 3908
 Skew product 2972, 4602
 action 6799
 group extensions of dynamical systems 2973
 random Dynamical Systems 2973
 system 1945
 Skew profile 3904, 3906, 3915
 Skewness 5222
 Skimming price 1969
 Skin effect 2622
 skin depth 2622, 2626
 Skin sensitization 2168
 Skinner, B.F. 1886
 Slab gel electrophoresis 5580
 SLAM 6076
 Slant stack 9176, 9177
 Slater 9945
 index 9951
 order 9951
 problem 9951, 9957
 winner 9951
 Slater's rule (transition state technique) 7316
 Slaved 4593
 Slaving principle 629, 631, 8927, 8928, 8930
 SLE 8726
 SLE evolution 8713
 SLE parameter 8726
 SLE property 8722
 Slide rule 272, 279, 5476
 Sliderblock 5024
 Sliding block code 5456, 8893
 Sliding state 5027
 Slime mold 3349, 8940
 Slip 2590, 9586
 Slip-velocity 2488
 SLM 6398, 6399
 Slow earthquake 1221, 2493
 Slow manifold 7612
 Slow slip events 4271
 and nonvulcanic tremor 4272
 and seismic hazard 4272
 geodetic observations 4271
 temporal characteristics 4272
 Slow system 6700
 Slow wave 9919
 Slowdown 7522
 Slowly-varying envelope approximation 6128
 Slowness 9179
 Slug 9891
 Slug flow 9818
 Slugbot 3690
 Slumps 9578
 Smale 279
 work in reduction theory 5493
 Smale horseshoe 4727
 Small angle neutron scattering (SANS) 6814
 Small denominator 5989, 6179, 6666, 6669, 6710, 6714, 6763
 Small divisor 5064, 5071, 6322, 6674
 Small divisor problem 1939
 Small earthquake
 estimate of source processes 2545
 initial phase 2543
 main phase 2543
 waveforms 2544, 2547, 2548
 Small gene circuits 1188, 1197
 Small labeled-sample problem 5355
 Small noise 6232
 Small parameter ϵ 6210
 Small-scale inhomogeneities 7928
 Small-scale instability 6118
 Small time locally controllable 3532
 Small world 1431, 2730, 3856, 4663, 6053, 8263
 Small-world cities 7968
 Small-world models 6053, 8266, 8277
 Small-world network 570, 577, 725, 4835, 6049, 6787, 8912
 ultra-small 6053
 Small-world phenomenon 6053, 7504
 Small-world properties 5270
 Smallest available pore, invasion percolation 4948
 Smallness assumption 5073
 Smectic 2034
 Smith dynamic 3184
 Smith set 9952
 Smith winners 9958
 SMM 8800
 Smoke 8313
 Smoldyn 8742
 Smoluchowski 8742

- Smooth dynamical system 5452
 Smooth flow 4723
 Smooth nonsingular transformations 3068
 Smooth transition 3443
 Smooth transition autoregressive model 446
 "Smooth transition" threshold models 2747
 Smoothing 3310
 Smoothness 1679
 exponent 592
 of the invariant manifold 942
 SMS *see* Stationary Markovian strategy (SMS)
 Snijders, Tom 8276
 Snow cover 1705
 Snow transport 883
 Snowball and walk samples 8214
 Snowball earth 3295
 Snowball sampling 8214, 8217
 Snowdrift game 6648
 Snowflakes 4500
 SNOWPACK 1706
 SNP 5546, 5548
 SNTHERM 1705
 SO model 9441
 SOAR architecture 1345
 Sobolev space 1724, 7442, 7443, 10037
 SOC *see* Self-organized critical system
 Soccer 6387
 Social 2856
 Social ability 187
 agent-based modeling 191
 Social actors 5999
 Social and emotional development 1903
 Social aspect 3138
 Social choice correspondence 9943
 Social choice function 1674, 5516, 5518, 9938,
 9943
 Social choice problem 9935
 Social choice rule 4788
 Social circuit dependence 8326
 Social classes 2823
 Social cognition 1889, 1904
 Social comparison or competition 8309
 Social contract 5678
 evolution of 5683
 Social coordination dynamics (SCD) 8199, 8200,
 8205
 Social cost of carbon 1091
 Social-cultural evolution 8194
 Social darwinism 8381
 Social development 1897
 Social dilemmas 8188
 Social dyads 1555
 Social experiments, randomized trials 5554
 Social field 6478, 8414
 Social force 6478
 Social influence 8311, 8313, 8330, 8422, 8427,
 8429
 clustering 8428
 polarization 8428
 Social insects 3683, 3684, 3691
 Social interactions 3381
 Social judgment 8422, 8423, 8425, 8427
 Social learning 1926, 1927
 deferred imitation 1927
 emulation 1927
 imitation 1927
 Social memory 8207, 8208
 Social net 7833
 Social network 3214, 4314, 4343, 5378, 5389,
 5390, 8281, 8291–8293, 8295, 8339
 Social network topology, agent-based
 modeling 180
 Social networking community 4367, 4368
 Social objectives 4790
 Social phenomenon 3109, 3111
 Social physics 1044, 8266, 8269
 Social process 7840, 8406
 Social robotics 4648
 Social science 8376
 Social selection 8330
 Social self-help 3111
 Social space 9414
 Social structures 3213
 Social system 7840, 8266
 Social temperature 9416
 Social theory 9068
 Social-theory building 8376
 Social volatility, agent-based modeling 180
 Socialization 8185
 Socially assistive robotics (SAR) 4648
 Socially-situated learning 1898
 Society 3281
 Socio-cultural-cognitive algorithm 8195
 Sociograms 8267

- Sociomatrix 8191
 Sociometric data 8311
 Sociometric studies 8311
 Sociometry 8267, 8349
 Sociophysics 2802, 6381, 8376, 8380, 8413
 Sociotype 3209
 Soddy 6805
 Sofic shift 8895
 Sofic subshift 9249
 Soft-assembled 1889
 Soft assembly 1877
 Soft computing 224, 4326, 4335, 4337, 4870
 Soft constraints 6936
 Soft magnet 5027
 Soft margin linear SVM classification 2175
 Soft margin nonlinear SVM classification 2179
 Soft modes 5015
 Soft thresholding 10033, 10037
 Soft wavelet thresholding 10036
 Software agent 8375
 mobile 5604
 Software architectures 1225
 Software engineering 4363
 Software tool, comparison of commercial 3168
 Soil carbon sequestration 1077
 Soil-structure interaction 2371, 2421, 2425, 2434,
 7899
 example 2379
 frequencies of vibration 2381
 Millikan library 2381
 shear wave velocity 2381
 Solar corona 22
 Solar energetic particles 29
 Solar flare 22, 9269
 Solar system 388
 Liapunov times 388
 Solenoid 2265, 4531
 Solenoid attractor 4727
 Solid-on-solid 6412, 6416
 Solitary structures 6474
 Solitary wave solutions 80, 1376, 6206,
 6453–6455, 8112, 8115–8118, 8123, 8476, 8479,
 8504, 9970, 9982, 9989, 9997
 Soliton 80, 84, 1376, 1394, 2341, 4961, 5138–5141,
 5143–5145, 6137, 6206, 6453, 6454, 8113, 8465,
 8479, 8504, 8511, 9705, 9970, 9984, 9988, 9989
 annihilation 8497
 antikink 8483
 breather 8483
 collision of two solitons 8504
 diffractive 8483
 dispersive 8483
 envelope 8484
 fission 8497
 fusion 8496
 hidden 8489
 historical discovery 8467
 interaction 8491
 internal 8483
 ion-acoustic 8483
 kink 8483
 line 8485
 Manakov 1378
 mathematical methods 8467
 nontopological 8482
 optical spatial 8483
 physical properties 8476
 plane 8485
 Rossby 8483
 Russell 8482
 semi-discrete 1394
 shallow-water 8482
 ship-induced 8499
 spatial 1394
 spiraling 8497
 surface 8483
 topological 8482
 vector 1377
 vector (composite) 8485
 Soliton CA 773
 Soliton lasers 6137, 6161
 Soliton perturbation 8453
 exp-function method 8456
 homotopy perturbation method 8455
 parameter-expansion method 8456
 variational approach 8454
 variational iteration method 8455
 Soliton perturbation theory 8505
 Soliton solution 4961, 4962, 4969, 8479
 single- and multi-soliton solutions 8481
 two-soliton solution 8491
 Solomon 6788
 Solubility 853

- Solution 1511, 1513, 1515
 additive 1665
 anonymity 1666
 balanced contributions 1666
 complete 4676
 constrained egalitarian 1666
 core 1667
 discrete 4676
 Hamilton–Jacobi equations 4545
 long-time behavior 4556
 maximal 4676
 nontrivial 4676
 per capita nucleolus 1668
 periodic 6588, 6603, 6610
 Shapley-value 1665
 strong monotonicity 1666
 symmetric 1665
 Zeno 4676
- Solution concept 1509–1511, 1513
- Solution path 9225
- Solution space 6790, 6793, 6794
- Soma 1814, 4871
- Somatosensory error maps 2320
- Sompi method 9914
- Songs 2314
- Sophus Lie 6177
- Sound spectrograms 2317
- Source complexity 2484, 2488, 2492
- Source depth 2493
- Source durations 9582
- Source effects 4439
- Source entropy, DNA sequence 495
- Source localization 4691
- Source mechanism 2474, 2482, 2483, 2487
 of VLP signals 9913
- Source parameters 2399
- Source spectrum 2485, 9581, 9585
 seismic 2482
- Source time function 2583, 9904
 earthquake 2545, 2550
- SP *see* Significance profile
- Space 208, 6398, 6401
 as programming object 262
 configuration 6601
 cyclic 8555
 exponential 6402
 homogeneous space 3029
- $K(\pi, 1)$ 6602
 L^2 6600
 modeling of 337
 of paths 6601
 of relative loop 6602
 of relative loops 6601
 Sobolev 6600
 symmetric fock 8556
 Veech moduli 8568
- Space-bounded quantum computation 7196
- Space complexity 7716
- Space-fractional diffusion equation 5220
- Space three-body problem 5974
- Space-time
 diagram 249, 803
 fractality 3870
- Spam 4371
- Spam farm 5279
- Span programs 7109
- Spandrel 491, 5698
- Spanning cluster 1448
- SPARQL (SPARQL protocol and RDF query language) 8085
- Sparre Andersen theorem 5227
- Sparse representation 1720
- Sparsely sampled, time series 3585
- Sparsity 1719, 1989, 8675
- Spatial autocorrelation 8273, 8311
- Spatial bridge 4663
- Spatial correlation 1698, 3792, 6570
- Spatial databases 7737
- Spatial discrete scale invariance 7579
- Spatial DSI 7578
- Spatial entropy 1047
- Spatial graphs 2742
- Spatial heterogeneity 7855
- Spatial interaction 1043, 1045, 1047, 1055
- Spatial light Modulators 6394
- Spatial patterns 8946
- Spatial periodicity, fracture networks 6510
- Spatial random fields 4448
 correlation lengths 4448
 fractal dimension 4448
 Hurst number 4448
 von Karman auto-correlation function 4448
- Spatial scaling structure, polymer physics 6817
- Spatial sequencing, in amorphous computing 266

- Spatial structure 2737
 Spatially extended coevolution 3240
 Spatially grounded models 192
 Spatially separated GPs 9376
 SpatialRes 6398, 6399, 6401
 Spatio-temporal intensities
 Bayesian 9848
 kernel 9847
 nearest-neighbor 9847
 nearest-neighbor kernel 9847
 Spatio-temporal pattern 6477, 8933
 Spatiotemporal congested traffic pattern 9501
 Spatiotemporal dynamics of traffic congestion 9409
 Spatiotemporal stress field 7855
 SPC (search path count) weights 8253
 SPE *see* Subgame perfect equilibrium (SPE)
 SPE outcome path 2225
 dynamics 2225
 SPE payoff 2222
 Spearman correlogram 9856
 SPEC 5355
 Special fuzzy functions
 with LSE (SFF-LSE) method 4084
 with SVM (FF-SVM) method 4088
 Special fuzzy functions models (SFFM) 4092
 Special fuzzy functions (SFF) 4083, 4090
 Special symplectic reduction method 5497
 Specific entropy 7523
 Specific heat 692, 697, 700, 701
 Specifically branched chains 6842
 Spectral algorithm 1153
 Spectral analysis 3760
 Spectral bisection method 1147
 Spectral dimension 2253, 3888, 3889, 7569, 7571, 7572
 Spectral element scheme 7897
 Spectral elements 7892
 Spectral factorization problem 8755
 Spectral feature selection 5354
 Spectral form factor 7168
 Spectral mapping problem 948
 Spectral mapping property 8646
 Spectral methods 1501
 Spectral property 2921
 Spectral radius 6242
 Spectral representation 8719
 Spectral solution 7411
 Spectral theory, nonsingular systems 3069
 Spectral transport 8596
 Spectral weight 8719
 Spectroscopy, volcanic eruption 4850, 4851
 Spectrum 5022, 5464, 6653
 absolutely continuous 8555
 countable Lebesgue spectrum 2928
 discrete 8555
 Haar 8555
 of agents 1338
 rational 2928
 simple 8555
 singular 8555
 Speech cues 2315
 Speech perception 2321
 Speech production 2320
 Speech recognition 2315
 Speech signal reconstruction 3252
 Speech sound map 2320
 Speed 7522
 and density disturbance 9282
 free 3152
 horizontal upward walking 3152
 upstairs 3152
 Speed disturbance 9285
 Speed subshift 9257
 Speed-up theorems 808
 Spherical Paul trap, quantum computing 7223
 Spherical source 9905
 Spikes 6100, 6102
 Spiking neural P system 5525
 Spin 5748
 quantum mechanics 7371
 Spin blockade 7309
 Spin-chain 7355
 Spin chirality 9649
 Spin conservation 8110
 Spin current 8106, 8109, 8608, 8612
 pure spin current 8611
 Spin density 8106
 Spin-density functional theory
 Kohn-Sham (KS) equations 7314
 local spin density approximation 7315
 Spin dipole 8108
 Spin dynamics 8588
 Spin filter 8598, 8608, 8610

- Spin gap 9685
 Spin glass 6418
 Spin hall effect 8599, 8611
 Spin interaction, polymer physics 6815
 Spin models 610
 Spin-orbit interaction 6681, 6682, 8105, 8598, 8607
 Rashba SO 8598, 8608, 8612
 Spin pockets 8595
 Spin polarization 8578
 Spin precession 8110
 Spin pumping 8599, 8611
 Spin qubits 9645
 Spin ratchets 8599, 8611
 Spin-spin contact 7446
 Spin splittings 5775
 Spin-stiffness 8583
 Spin-switch 8598
 Spin switches 8607
 Spin transport 8104
 Spin transport current 8108
 Spin wave stiffness 1275
 Spinodal 3618, 5024
 Spinodal dewetting 3633
 Spiral defect chaos 6464
 Spiral galaxy 413
 Spiral wave 776, 6470, 6472
 Splay faulting 9588
 SPLERT *see* System for processing local earthquakes in real time
 Spline spaces 5801
 approximation order 5808
 dimension of 5839
 Spline wavelets 10033
 Splines 1721
 B-splines 6856
 box splines 6856
 Split brain patients 1426
 Split selection 1827
 Splitting lemma 7634
 Splitting method
 head of the splitting 794
 leading tile 794
 region of the splitting 794
 Splitting of a flow interruption 9398
 Spontaneous emission 6118
 Spontaneous emission noise 6141
 Spontaneous symmetry breaking 6187
 Spontaneous traffic breakdown 9320, 9380
 Spontaneous wide moving jam emergence in synchronized flow 9326
 Sprawling 9426
 Spreading of an epidemic 3848
 Spreading rate
 critical 6060
 endemic 6060
 epidemic threshold 6060
 Spreading set 9256
 Spreads 5408
 Spring embedder 1254, 8352
 Spyware 4370
 Square radius of gyration 6840
 Square synchronization algorithm 3567
 Squeezing procedure 3329
 Squirt flow 2694
 SRB measure 1006, 1007, 5453
 SRM *see* Structural risk minimization
 sSelect 5356
 SSFM problem 4149
 Stability 1520, 1541, 1555, 2733, 3662, 4681, 4725, 5722, 6037, 6104, 6426, 6434, 8001, 8003, 8004, 8199, 8201, 8927
 external 1520
 global (pre-)asymptotic 4681
 internal 1520
 Liapunov 6590
 linear 6104, 6590
 multi 6105, 6111
 of periodic orbits 6590
 spectral 6590
 stability of rotating fluid bodies 8631
 stability of the solar system 8631
 vulnerability 2736
 Stability analysis, biological models 1190
 Stability criterion 9997
 Stability house 2066
 Stability index 6434
 Stability theory 8631
 Stabilizability 3524
 Stabilization 1488, 1493, 4687, 8617
 Stabilizer code 7335
 Stable 713, 8631
 and unstable manifolds 998

- asymptotically stable 8631
- orbitally asymptotically stable 8631
- Stable attractors 5720
- Stable completion method 596
- Stable distributions 3440, 3812
- Stable games 3188, 3197
- Stable laws 965
- Stable librations 6447
- Stable manifold 2265, 4516, 4727, 8644
- Stable manifold theorem 4726, 4728
- Stable matching problem 4097
- Stable mode 8930
- Stable outcome 9656
 - corewise-stability 9657
 - pairwise-stability 9657
 - setwise-stability 9657
 - strong-corewise-stability 9657
- Stable set 1520, 4095, 4726, 6026, 6040, 9227
 - discriminatory 1522
 - farsighted 1528
 - objective 1522
 - sdom 1526
 - symmetric 1522
 - wdom 1526
- Stable subset 9231
- Stable trajectories, complex 6105
- Stäckel potential 403
- Stackelberg payoff, pure action 7657
- Stacking 5322
- Stag hunt 6645
- Stag hunt game 3178, 3179
- Stage 1898, 4099, 4105
- Stage transitions 1899
- Stairs 3152
- Stampede 3153, 3154
- Stand-alone core 1676
- Standard constraints, fuzzy logic 3999
- Standard deviation 6145
- Standard map 384, 411, 1935
- Standard refinable function 592
- Standard symplectic form 5065
- Standard variation, n -body problem 5983
- Star 3274, 3279, 8324
- Star clusters
 - gravothermal catastrophe 8691
 - self-similar solution 8693
- thermal stability 8691
- thermal timescale 8692
- Star-extension 6294
- super-structure 6303
- STAR model
 - multiple regime STAR model 447
 - n dimensional two-regime STAR model 447
- Stark effect 6737
- Stark shift 5773
- State 1311, 5191, 8698
 - adjoint 1503
 - biochemical 526, 531
 - border 803
 - clustered 631, 632
 - desynchronized 632
 - differentiated 526
 - dynamical 526, 527
 - equilibrium 533
 - final 1311
 - four-cluster 635
 - initial 1312
 - of nature 427–430
 - of the system, controllability 4805
 - of the world 428, 429, 431, 4788
 - quantum computing 7220
 - quiescent 803
 - stable 528, 529
 - steady 527, 538
 - steady/stationary 528
 - synchronized 632
 - two-cluster 635
 - unstable 528, 529, 538
- State-change complexity 3542
- State constraint 6224
- State dependence 2771
- State detection, ionic qubit 7229
- State independent signaling 7646
- State initialization, quantum computing 7225
- State-linear realization 6376
- State-linear skew-adjoint realization 6376
- State-linear systems, observation space 6376
- State observers 9088
 - high-gain observer 9088
- State space 482, 713, 1887
 - high dimensional 1540
 - lower dimensional 1540
- State-space grids 1882

- State-space model 2751, 2753
 State-space planning 5192
 State-space realizations 8753
 State transition 1312
 diagram 64, 67, 71, 75
 equation 4077
 map, Boolean networks 1199
 probabilities 3696
 table, Boolean networks 1199
 State variable 1488
 State vector 8926
 stochastic processes 3577
 States
 alternative 528, 529
 biochemical 527, 531
 dynamical 527
 epigenetic 527
 functional transformation of 187
 localized 6104, 6111
 oscillation 545
 oscillatory 6104
 stable 527
 steady 527, 529
 Static assignment algorithms
 equilibrium 9436
 non-equilibrium 9436
 Static circular crack 2590
 Static coupling patterns 8916
 Static friction 5025
 Static games 4095, 8649
 Static model (developmental) 1882
 Static O-D estimation 9452
 Static routing 9434
 Static strain energy 2590
 Static traffic assignment 9436
 Stationarity 8722
 Stationary Markov process 2935
 Stationary Markovian strategy (SMS) 2217, 2218
 Stationary process 5039, 5453, 8669, 8768
 past and future subspaces 8757
 scattering pair 8758
 Stationary stochastic process 2935, 8752
 distribution 2935
 Stationary structures 6467, 6469
 Statistical analysis of microarray data 1234
 model-based analysis of gene expression profiles 1237
 Statistical control chart 9846
 Statistical ensemble 5671
 Statistical hydrodynamics 3648
 Statistical inference 6000
 Statistical inference modeling 522
 Statistical inference models 512
 Statistical inference networks 516
 Statistical learning 5206, 5207, 5210, 5217
 Statistical mechanics 400, 1269, 2803, 2859, 3364, 4380, 4999
 biological systems 2700
 ecosystems 2706
 edwards ensemble 4999
 entropy 4999
 Statistical mechanics ensembles 695
 Statistical methods 5999
 Statistical models
 Bayesian mixture models 1240
 Bayesian time series models 1240
 clustering 1240
 Dirichlet process 1232
 for fault slip 2596
 mixture models 1231, 1232
 mixture of Dirichlet processes 1232
 model-based analysis of gene expression profiles 1237
 neural networks 1240
 partial least squares (PLS) 1240
 principal components analysis 1240
 random effect 1232
 regression models 1231
 state-space models 1231, 1232
 wavelets 1240
 Statistical physics 721, 5024, 6407, 8711, 8714
 Statistical stability 954
 Statistical tests about fuzzy means 8688
 Statistical thermodynamic 5668
 Statistical zero-knowledge 7191
 Statistically independent 370
 Statistics 2802
 anomalous 3591
 Statistics of earthquakes 5022
 Staudinger's relation 6848
 Steady bifurcation
 liquids 5935
 three-dimensional flow 5940
 Steady flow, a liquid past a body 5938

- Steady state 9080, 9082, 9841
 behavior 9082
 locus 9082
 motion 9082
 nonequilibrium 6953
 Steady-state compliance 6849
 Steady-state flow 5930
 Steady-state solutions
 Navier–Stokes equations 5930
 Steady state systems
 kinetics 2701
 Steam 9880
 Steam reforming
 design of improved catalyst 1327
 elementary reaction steps 1327
 Steam-reforming 1326
 Steen Rasmussen's 933
 Steep function 5991
 Steepest descent control law 2058
 Steered 7036
 Stefan problem 3724
 Stella 9015
 Stellar dynamics 389
 Stellar evolution 3279
 STEM 5892
 Stem cells 1192
 Step
 collision 3161
 function 1817
 propagation 3161
 100-Step rule 3336
 Step size 1820
 Stepover 5026
 Stepped drum 5476
 calculator 5476
 Stepping stone patch 2741
 Stern's behavioral explanation model 3120
 Stick-pulling 3691, 3692, 3694
 Stick-slip 5583
 Sticker model 2101
 Stickiness 409
 Stiffness 691
 Stiffness exponent 6419
 Stigmergy 120, 8869, 8871, 8872, 8877
 Stimulated emission 6118
 Stimulation
 anti-kindling 640, 641
 cortical 627
 current 634
 deep brain 627
 demand-controlled 630
 desynchronizing 629, 639
 double-pulse 630
 high-frequency 627, 633
 high-frequency deep brain 629, 641
 kindling 640, 641
 low-frequency 639
 multisite coordinated delayed feedback 629
 multisite coordinated reset 629–631, 634, 641
 nonlinear delayed feedback 629
 open-loop type 632
 permanent deep brain 628
 signal 630, 634–636
 single-pulse 630
 site 631, 635
 Stimulation protocol 639, 640
 Stimulation-registration setup 638, 639
 Stimulation techniques 628, 629
 Stimulus 6110, 6111
 STING 5059
 Stochastic 689, 692, 694, 3365, 3373, 7719
 Stochastic acceleration 22, 23, 25
 Stochastic actor-oriented model 6003
 Stochastic analysis, field theoretic methods 7025
 Stochastic averaging of the wave equation 7920
 Stochastic branching model 5028
 Stochastic cascade process 3591
 scale 3592
 Stochastic climate model 2
 Stochastic complex systems 3361
 Stochastic convolution 6233
 Stochastic data analysis 3577
 Stochastic differential and difference equations
 8750
 Stochastic differential equation 3445
 Langevin-type 3361, 3369
 Stochastic differential equations 8775
 Stochastic differential games 6221
 Stochastic dynamical system 6232, 8750
 on Hilbert spaces 6217
 Stochastic dynamics 729, 3367, 3369
 Stochastic evolution equations 3578
 Stochastic fluctuations 3368
 Stochastic focusing 556, 8735

- Stochastic forces 3583, 5733
 Stochastic game 2216, 4096
 folk theorem 2218
 Stochastic game model
 equilibrium 2217
 history 2217
 set-up 2216
 state space 2217
 state variable 2217
 Stochastic growth 2811
 Stochastic interacting particle systems 3365
 Stochastic inverse 9193
 Stochastic kinetics 3366
 Stochastic Loewner evolution 8710, 8713, 8720
 Stochastic Lorenz equation 3586
 Stochastic matrix 5455, 8768
 Stochastic methods 8266
 Stochastic models 2556
 GPS measurements 2557
 instrumental catalogs 2557
 statistical seismology 2557
 Stochastic network, rock material 4955
 Stochastic noise 3370
 Stochastic optimization 4910
 Stochastic partial differential equation 6229
 Stochastic perturbations 970, 6232
 Stochastic phase space 167
 Stochastic processes 3361, 3365, 3368, 3574, 3575, 3583, 3586–3589, 3591–3593, 4513, 6009, 7569
 statistical description 3579
 Stochastic quantization 6231
 Stochastic realization 8752, 8753
 generating white noise w 8754
 state process x 8754
 stochastic realization of discrete-time random processes 8753
 Stochastic resonance 278
 Stochastic similarity matrices 7431, 7455, 7457
 Stochastic similarity matrix 7456
 Stochastic simulation 730
 Stochastic simulation algorithm 729
 Stochastic stability 954, 3194–3197, 4732
 Stochastic time series analysis 3582
 Stochastic transformation 7435
 Stochastic volatility 4129
 different notions of 8783
 model 3446, 5328, 5329
 short definition 8783
 Stochastically stable state 3176
 Stochasticity 3361
 Stock 5407, 7842, 8991, 9043
 London Stock Exchange 5408
 Stock-flow diagrams 673
 Stock management 676
 Stock market 4925
 crashes 7020
 Stock return 3454
 Stoichiometric matrix 328, 557, 558, 5541, 8733
 Stoichiometry 556, 5539, 5548
 Stokes approximation
 viscous liquids 5941
 Stokes equations 549
 Stokes expansion 9979, 10000
 Stokes flow 5576
 Stokes line 6748, 6752
 Stokes paradox, viscous liquids 5941
 Stokes rule 6752
 Stokes water waves 10003
 Stokes waves 9977
 Stokman, Frans 8269
 Stone–Wales topological defect 699, 700
 Stone–Wales transformation 9151
 Stop and go 9371, 9422
 Stop-and-go wave 6488
 Stop-loss orders 5415
 Stopping criterion 5351
 Stopping rule 1816, 1819
 Stopping time 8387, 8394–8396
 Storm surge 3126
 Story 3120, 3125
 images tell a story 3125
 story telling bonds neighbor 3125
 Strain 694, 699, 1320, 5012, 5752, 5753, 5763
 Strand asymmetries 3913
 Strange attractor 383, 3087, 3829, 3837, 3838, 3842, 4593, 6134, 6629
 Hénon scheme 3839
 nonlinear dynamics 2705
 Strategic 4098
 Strategic abstention 9941
 Strategic analysis of markets 4108
 Strategic basin of attraction 6026
 Strategic behavior 1980

- Strategic decision processing system 7850
 Strategic flexibility 7833, 7842
 Strategic form 1510, 1528, 1587
 Strategic game 1660
 Strategic management 7836
 Strategic manipulation 1676
 Strategic situation formulation 7838
 Strategic voting 9934, 9938, 9940
 Strategically abstain 9941
 Strategies and tactics net 7834
 Strategy 1510, 1949, 2107, 4098, 5740, 7632, 8381, 8698
 behavioral 7617
 business 7835
 copycat 7840
 corporate 7835
 divisional 7835
 ε -optimal 8701
 functional 7835
 hierarchical 5740
 mixed 8700
 of a player 7630
 private 7627
 process 7835
 process or functional 7835
 public 7625
 pure 8700
 stationary 8700
 stationary Markovian 2217
 tradeoffs-free 7834
 Strategy design 7839, 7850, 7851
 tradeoffs-free 7835
 Strategy implementation 670, 672
 calibration 672, 674
 Strategy-proof 1672
 group 1672
 Strategy-proofness 1672, 5514
 Stratification 2265, 4515, 6195, 6198
 Stratified count, fuzzy logic 3991
 Stratified fluid 6207
 Stratified sampling 5569
 choice-based sampling 5569
 endogenously stratification 5570
 weighted GMM estimation 5570
 Stratonovich definition 3578
 Strength profile, earthquake 2553
 Strength threshold 5023
 Stress 2636, 5012, 9584
 and triggering, static 2601
 asymmetric 2636
 Stress chains 5003
 Stress change
 dynamic 2600
 static 2600
 Stress concentration 2593
 Stress corrosion 2615
 Stress drop 2590, 10053
 Stress glut 9902
 Stress intensity factor 2593
 Stress release 6490
 Stress-release model 2564
 conditional intensity 2565
 coupled stress release model 2565
 Stress sensitivity 7927
 Stress transmission 4998
 Stress vector, Navier–Stokes equations 5929
 Stressed backbone 2838
 Stretched exponential 3715, 3772
 Stretched exponential distribution 7012
 Stretched vortices 3646
 Stretching tensor, fluids 5929
 Strichartz estimates 2045
 Strictly exogenous 2773
 Strictly hyperbolic system 4716
 Strike fault 9614
 Strike slip fault 5021
 String–string deformation 2636
 Strings, cosmic 1642
 Stripe formation 6482
 STRIPS 5188
 Strogatz, Steven 8269, 8277
 Stromboli 9786
 Strong and weak memory 1624
 Strong congestion 9369
 Strong coupling limit, cavity-QED 7245
 Strong disorder 6501
 Strong earthquake 1625
 Strong electron–electron interactions 7350
 Strong feller 6231
 Strong glass-formers 4212
 Strong ground motions 7894
 Strong interactions 6663
 Strong law of large numbers 957
 Strong L_p inequality 2937

- Strong mixing 2946
 Strong shift equivalence 8897
 Strong stability 6027, 6042
 Strong ties 8254, 8263
 Strong transversality property 8644
 Strong turbulence 6195, 6201
 Strong uncertainty 4633
 Strongly connected components 5269, 6245
 Strongly irreducible 8906
 Strongly mixing 6232, 7523
 Strongly nonlinear 5255
 Strongly semiconcave, Hamilton–Jacobi equations 4547
 Strongly semiconvex, Hamilton–Jacobi equations 4547
 Structurally dynamic cellular automata
 CA simulators 8831
 classes of behavior 8824
 hierarchy of models 8831
 labeled links model 8830
 models of computation 8829
 models of fundamental physics 8843
 random dynamics approximation 8838
 related graph dynamical systems 8840
 relative location model 8830
 statistical measures 8826
 symmetric links 8830
 Structural balance 6005
 Structural change 5326, 5328, 5330, 5331, 5344
 Structural complexity 491
 Structural damage 2371
 Structural damage detection 2372
 Structural descriptor 2114, 2140, 2160
 Structural equivalence 8273, 8289, 8300, 8314
 Structural form 214
 Structural health monitoring 2371
 Structural hierarchies 4593
 Structural holes 8239, 8274, 8284
 non-redundant links 2735
 Structural individualism 6003
 Structural models 2375, 5559
 causality 5560
 conditional prediction 5559
 cowles commission approach 5559
 natural frequency of vibration 2375
 oscillator 2375
 reduced form 5559
 wave guide 2376
 wave travel 2376
 Structural position 2735
 Structural properties 654
 Structural risk minimization (SRM) 4086
 Structural robustness, biological models 1190
 Structural stability 954, 4731, 6699, 8643
 Structural system 2421
 Structural unstable 711
 Structurally dynamic cellular automata 840, 916, 8816
 basic model 8818
 numbers of possible rules 8822
 Structurally dynamic disordered cellular Networks 8844
 Structurally stable 3098, 4516, 6311, 8643
 Structure 2371, 2433, 5737, 6310, 6317
 complex 7837
 complicated 7837
 excitation of 2433
 multi-symplectic 6609
 of a molecule in AC 328
 preservation 6317, 6322
 stock and flow 7847, 7849
 symplectic 6588, 6610
 Structure-activity relationships (SAR) 2114, 2140, 2161
 Structure causes performance 7841
 Structure condition 6221
 Structure contribution approach 8949
 Structure (Coulomb “diamonds”) 7311
 Structure factor 2026
 biological fractals 3792
 Structure functions 3652, 8537, 8542
 range-limited 8542
 Structure indices 2642
 phase shift 2642
 Structure-odor classification 2182
 Structure-property models 2140
 Structure-selectivity model 2149
 Structure-to-function mapping 330
 Structure/traversal isomorphism 4608
 robust information transmission 4610
 transmission quality 4613
 traversal 4611
 Student *t* distribution 3421
 Sturm–Liouville eigenvalue problem 7128

- Style 1266
 SU(2), quantum mechanics 7372
 Sub- and supersolutions 6619
 Sub-nets 2400
 Sub-Riemannian geometry 6217
 Subadditive
 ergodic theory 6944
 Subband 7664, 8576, 8586
 Subchain 6844
 Subchain configuration 6818
 Subdeterminant rank 1868
 Subdiffusion 311, 2872, 5223, 5232, 6195, 6203
 Subdigraph 6242
 induced 6242
 Subdirect product 8298
 Subdivision scheme 592
 Subduction 9587, 9589
 Subduction zone 2484, 2608
 Subduction zone earthquake 10047
 Subeconomy 2285
 Subgame perfect equilibrium (SPE) 2218, 4100
 Subgradient 6271
 ergodic theory 6945
 limiting 6274, 6275
 proximal 6274
 viscosity 6275
 Subgraph 575, 8249, 8271
 and network motifs 5695
 complete bipartite 8258
 examples 5695
 in complex networks 5694
 induced 8249
 spanning 8249
 Subgraph abundance, network 507
 Subgraph-based information complexity descriptors 4833
 Subgraph census 5693, 5694
 Subgraph composition, network 507
 Subgraph count 4833
 Subgraph information content, network 507
 Subharmonic instabilities 2327
 Subharmonic solution 5306
 Subinverse 8297
 Subjective probability 9418
 Subjectivity 1429
 Submanifold, initial 5491
 Submarine landslides 1221
 Submatrix, rank 1868
 Submeasures 2235
 Submodular function 6421
 Suboptimal neuro-fuzzy systems 6095
 Suboptimum solution 1818
 Subordination 5232
 Subquadratic algorithms 8247
 Subscript 1962
 Subsequence ergodic theorem 2945
 Subshift 790, 2234, 2981, 9249
 admissible transitions 2981
 entropy of a 790
 ergodic theory 6941
 finite type 790, 6947
 forbidden words of a 790
 irreducible 790
 language of a 790
 Markov subshift 2981
 of finite type (SFT) 2981
 one-sided Markov subshift 2981
 sofic 790
 strongly irreducible 2981
 topologically mixing 2981
 Subshift of finite type 954, 9249
 Subsidiaries, active 7835
 Subsolutions
 Hamilton–Jacobi equations 4543, 4548, 4549
 regularity results 4547
 Subspace algorithms 8763
 Subspace identification 8760
 Substance abuse
 cocaine prevalence 4577
 heroin addiction 4577
 tobacco 4577
 Substrates 723
 Subsumption 6070
 Subsumption architecture 3689
 Subthalamic nucleus (STN) 629
 Subthreshold logic 9720
 Sufficiency 8221
 Sufficient statistics 4627, 6981, 8228
 sufficient unit 4609, 4610
 Sugarscape 94
 Sugeno integral 232, 6932
 Sugeno model 4696, 4882
 Sugeno–Yasukawa models 4092
 Suitability of membership functions 4152

- Suitability of the derived membership functions 4157
 Sum resonance 6626, 6629, 6632, 6635
 Sum rules 592
 multiwavelet 5847
 Sum squared error 1818
 Sumatra–Andaman earthquake 4265
 Sumatra earthquake 4846
 Summable potential
 Gibbs state 6947
 Summation at the smallest term 5990
 Summation rule 6663
 Summation theorems 560
 Summer mean temperatures, observed and modeled 1098
 Sun 5473
 Sundman–Sperling estimates, generalized 5980
 Super-agents 150, 151
 Super-Arrhenius behaviour 4212
 Super-exchange 7352
 Super-graphs 5786
 Super-hydrophobic 5582
 Super-individual approach 150
 Super-localized wave functions 2254
 Super-recurrence 8489
 Super-structure, definition 6302
 Super-Turing power 288
 Supercell 5778, 8592
 Supercomputer, quantum simulation 7385
 Superconducting percolation networks 6555
 Superconductivity exponent 1408
 superconductivity 1410
 Superconductor 2021
 disordered 6413
 Superconductor–normal conductor 3850
 Supercooled phase 4211
 Supercritical bifurcation, liquids 5935
 Superdiffusion 311, 2871, 6195, 6203
 Superexponential stability 5994
 Superfield path integral 8591
 Superfluid 9681
 Superfluid stiffness 9689
 Superintegrable system 2265
 Superlattice 2648, 7405
 Supermassive black holes 29
 Supermodular games 3189, 3196, 3197
 Supernetworks 6035
 ->Supernetworks 6036
 Supernova 22, 28
 Superposition 7252, 7328
 Superposition principle 1023
 Superrigidity 3104
 Supersolid 9685
 Superstatistics 2878
 Superstrings 1642, 1656, 3869
 cosmic 1642, 1656
 Supersymmetry 3869
 Supervised feature selection 5352
 Supervised learning 1815, 1992, 2162
 Supply chain dynamics 676
 Support network 5681
 Support vector machines (SVM) 2171
 Support vector regression (SVR) 4086
 Support vectors, fuzzy system model evolution 4088
 Supremum, definition 6290
 Surface 714, 1307, 1310, 1311, 6412, 8122
 models 1310
 of section 6426, 6435
 reaction center 1307
 site 1307
 three low Miller index 1311
 Surface acoustic waves 1022
 Surface defects 1320
 Surface-electrode trap, quantum computing 7223
 Surface evolver 5582
 Surface Green's functions 7486
 Surface patterning 5574
 Surface reaction model 888
 Surface tension 9788, 9818
 Surface tension coefficient 5581
 Surface wave 2483, 2601, 2607, 3616, 8113
 Surface-wave magnitude 2479, 2480, 2484
 Surjective 64, 65, 70, 71
 cellular automata 2983
 Surjectivity 5439, 7680
 Surplus demand 7846
 Surprises, strategic 7834
 Surrogates 7996, 7999
 Survey sampling 8213, 8215, 8216
 Survival probability 5226, 5233
 Survivor distribution 7015
 Susceptible individual 6779
 Susceptible-infected-susceptible (SIS) model 654

- Susceptible-infective-removed (SIR) 3791
 model 4661
- Suspension flows 2974
- Sustainability 3126, 3138, 7842
- Sustainability implementation research 3111, 3138
- Sustainability management 9052
- Sustainable development 3131, 4632
- Sustainable solutions 7832
- SV 8784
- SVM *see* Support vector machines
- SVM regression 2180
- Svoboda 5475
- SVR *see* Support vector regression
- SWAP gate, quantum computing 7232
- Swarm 212, 3683, 8869–8873
 intelligence 3683, 3690
 robotics 3690
- Swarm behavior 8367
- Swarm-bot 3692
- Swarm intelligence 123, 8883
- Swarm optimization 8869
- Swarm robotics 8869
- Swarming behaviors 7724
- Swift–Hohenberg equation 3628, 8931
- Swift–Hohenberg–Haken equation 3629
- Swimming 548, 550
 efficiency 551
 optimal 549, 551
 strategies 549
- Swiss cheese model 1403
- Switchable channel 1369
- Switching 1548, 1555, 2090
- Sybil attack 5279
- Symbol 3353
 multiwavelet 5844
- Symbol binding 3353
- Symbol grounding 8098
- Symbolic action 1904
- Symbolic AI 1110, 3353
- Symbolic approach
 ACT-R 1113
 EPIC 1114
 SOAR 1113
- Symbolic dynamical system 8891, 9248
- Symbolic dynamics 956, 4729, 5439, 6941, 6943
- Symbolic grounding problem 1119
- Symbolic models 1999
- Symbolic processing 119
- Symbolic space 9248
- Symbolization 1901
- Symlet 10020
- Symmetric 3550
- Symmetric difference distance δ 9949
- Symmetric links SDCA model 8830
- Symmetric periodic orbit 6430
- Symmetric phase 5590, 5594, 5598, 5600
- Symmetric stable processes, ergodic theory 3076
- Symmetric theory 2837
- Symmetrical uncertainty 5357
- Symmetry 596, 1554, 2245, 5035, 6175, 6177, 6310, 6626, 6735, 6736, 6761, 8927, 9105
 and perturbation theory 6736
 and singularities 5487
 approximate symmetry 6182
 axial 6319
 axially 6316
 breaking 7136
 ecological 2706
 generalized symmetry 6190
 Hamiltonian systems with 6597
 mechanical systems 5483
 quantum mechanics 7373
 rotational 6315, 6319, 6320
 toroidal 6311, 6316, 6320, 6322
 torus 6315
- Symmetry algebra 5487
- Symmetry breaking 278, 658, 1549, 1551, 3288, 5727, 8928
 spontaneous 7136
- Symmetry-breaking field 6773
- Symmetry groups 593, 1547, 1554, 5963, 6632
 core 5969
 invariant 1547
 planar 3-body problem 5972
- Symmetry reduction 6175, 6187, 6603
- Symmetry state 8005
- Symplectic 2003, 5066, 5988, 6318
 matrix 5066
- Symplectic algorithms 8697
- Symplectic form 2265, 4528, 5084
- Symplectic manifold 2265, 5065, 5445
- Symplectic orbit reduction theorem 5491
- Symplectic orthogonal 5488

- Symplectic property 6433
 Symplectic reduced space 5486
 as coadjoint orbits 5490
 Symplectic reduction 5488
 special method 5497
 theorem 5486, 5487
 theory 5483, 5484
 without momentum maps 5497
 Symport/antiport 5525
 Synapse 3335, 3343, 6099, 6102, 6103
 Synaptic efficacy 3343
 Synaptic plasticity 639
 Synaptic weight 4871
 Synchronizability 8911
 Synchronization 627, 635, 637, 770, 1544, 1552, 1555, 3233, 3538, 4915, 6105, 6108, 7992, 7999, 8003, 8200, 8203, 8910
 clapping 1555
 manifold 8912
 oscillatory 1552
 pathological 627, 629
 Synchronized flow 9356, 9357, 9370, 9417
 Synchronized flow pattern 9356, 9364
 Synchronized flow traffic phase 9303, 9308
 Synchronized traffic congested pattern 9506
 Synchronizing word 9249
 Synchronous network 7714
 Synchronous updates 3234
 Synchrotron 22
 Synchrotron losses 27
 Syncopation-synchronization paradigm 5734
 Syndemics 4586
 Syndrome 8939
 Synergetic cities 7962
 Synergetic computer 8937, 8938
 learning procedure 8938
 Synergetic navigation system 8003, 8007
 Synergetics 627, 1542, 4895, 5723, 7992–7994, 8003, 8005, 8043, 8381, 8413, 8926, 8927, 8942, 8946
 lower dimensional dynamics 1542
 Synergy 1537, 1540
 Syngas 1326
 Synonymous nucleotide substitution 5657
 Syntactic approach 432
 Syntactic closure 341
 Syntactic generator 1891
 Syntax 4392
 Synthesis 10015
 Synthetic aperture radar 1692
 Synthetic biology 258, 417, 567, 5537
 Synthetic catalogs 2359
 Synthetic chemistry 417
 Synthetic environments 185
 Synthetic genetic array (SGA) 9109
 Synthetic O-D generation 9451
 dynamic formulations 9454
 static formulations 9452
 Synthetic seismograms 9585
 Synthetic sickness or lethality (SSL) 9106
 System \mathbb{R}^N 6291
 System analysis 4364
 System-as-cause thinking 4564
 System commands, agents as 188
 System design 4364
 System dynamics (SD) 2285, 4475, 4565, 4577, 7842, 7849, 8371, 8406, 8974, 8975, 8983, 8991, 9000–9002, 9004, 9005, 9044, 9058
 applications, health care 4561
 as presentationist 9067
 case study 4567
 components 4564
 criticism 9061, 9068
 definition 4563
 foundations 9061
 history 4563
 justification in 9067
 model, configuration 4567
 model, health and social care 4567
 modeling tools 4565
 need 4564
 origin of 9058
 participative model building 4572
 servomechanism 9068
 simulation 9074
 studies, epidemiology in Europe 4571
 studies, health and social care management 4571
 thinking skills 4564
 workforce planning models, health management 4574
 System entity structure 356
 System frequency 2389

- System identification 5206, 5208–5210, 5214, 5215, 5217, 8759
 System implementation 4365
 System optimum 9434, 9441
 System size expansion 8780
 System structure 353, 7841
 System theory 8267, 8974, 8980
 Systems 2234, 2263, 7798, 8405
 adjoint 1503
 affine 1034, 1035
 approximately controllable 1489
 approximating 1037
 autopoietic 7843
 discrete time 1038
 dynamical 1034
 exactly controllable 1489
 for processing local earthquakes in real time (SPLERT) 2665
 fully nonlinear 1038
 Hamiltonian 6588, 6594
 hierarchical 7833
 Lagrangian with symmetries 6601
 lifted 1038
 linear 1038
 natural mechanical 6600
 nonlinear 1030, 1038
 null controllable 1489
 of balance laws 4714
 of cities 7957
 of conservation laws 4714
 purposeful 7833
 universal 1035
 well-posed 4675
 with discontinuities 961
 Systems affine 3530
 Systems analysis
 biological network 9103
 ecological complexity 2701
 Systems approaches 8974, 8975, 8978, 8982
 Systems biology 420, 477, 1227, 3978, 5537, 9091, 9093, 9095, 9097, 9098, 9102, 9103
 data integration 9103
 definition 9101, 9103
 emergent 9102
 model 9103
 networks 9102
 Systems biology workbench 567
 Systems ecology 2705
 Systems methodology 8979, 8982, 8983
 Systems movement 8975, 8977, 8979
 Systems neuroscience 7993
 Systems sciences 8974, 8977
 Systems theory 1044, 4634
 Systems thinking 671, 9044
 Systems thinking/system dynamics method 4565
 and modeling methodology 9045
 Syzygy 2265
 Szabó A 781, 789
 Szemerédi's Theorem 9244
 Szemerédi's theorem 3091, 5451
 Sznajd model 6385, 8390, 8391
 Sznajd-Weron, Katarzyna 8390
 Sznajd, Józef 8390
 Swierinski 3547, 3564
- T**
- Δt-Adaptation 7906
 t-Conform 224, 4067
 T-Equivalent 5458
 T-Exponential 6745
 T-Nonshrinkable 5458
 t-Norm 224, 4067
 T-Rank 5275
 T-Stage game 7633
 Table of games 9740
 Tactics 7839
 competitive 7839
 cooperative 7839
 counterproductive 7840
 defensive 7839
 implementation 7839
 marketing 7846
 offensive 7839
 piecemeal 7840
 2-Tag system 7688
 Tail 6241
 Tail entropy 967
 Taiwan 2397
 Takagi–Sugeno form 3243
 Takagi–Sugeno fuzzy rulebase 4083
 Takagi–Sugeno models 4092
 Takagi–Sugeno neuro-fuzzy systems 6092
 Take-profit orders 5415

- Tangent bundle 5445
 Tangent bundle reduction 5495
 Tangent differentiability 6297
 Tanh method 8120, 8121
 TAR model
 n dimensional two-regime TAR model 444
 nested TAR model 444
 Target 1502
 Target genes 1184
 Target knowledge system 4397
 Target properties, QSAR modeling 7073
 Targeted attacks 8263
 Task allocation 2085, 7725
 Task hierarchies 5190
 Tatonnement 204
 Taxonomy 7753–7755
 Taylor-based Reynolds number 3652
 Taylor–Couette experiment 3647
 Taylor–Couette flow 6195–6197
 bifurcation 5937
 Taylor–Couette instability 8941
 Taylor hypothesis 8531
 Taylor instability 8940
 Taylor length 3652
 Taylor vortices, liquids 5937
 Taylor’s conjecture 8527
 TDMA coloring algorithm 2054
 Technical analysis 3383
 Technical capability 1975
 Technical trading 5415
 support and resistance levels 5415
 Technical trading rule (TTR) 3519
 Technological knowledge 1974
 Technological society 3281
 Technology 7845
 Telecom industry models 685
 Teleoperation 3683, 3687, 3688
 Teleportation
 quantum 7394
 quantum computing 7240
 quantum information processing 7368
 Teleporting gates 7337
 Teleseismic magnitude methods
 tsunami warning 2666
 Telluric current 2621–2623
 Temperament 1903
 Temperature 695–697, 700, 701, 5001, 6382, 6805, 7591
 angoricity 5001
 dynamics 5000
 maximum temperature 7599
 temperature change 7591
 Temperley–Lieb algebra 5295, 7111
 Tempesti’s loop 8072
 Template 2110, 4414, 4415
 Temporal disorder 3575
 Temporal hierarchies 4593
 Temporal networks 8263
 Temporal physiological series 3798
 Temporal regularization 4680
 Temporal sequencing in amorphous computing 266
 Temporary reputation effects 7659
 Tensile crack 9904
 Tension
 interfacial 532, 533, 545
 surface 533
 Tensor product
 quantum mechanics 7373
 Tent map 3505
 Tenure 9099
 TeraGrid 5761
 Teramac 5872
 Teraoka 3564
 Term structures of intererates, applications 8793
 Terminal 4136
 complex 4140
 simple 4140
 Terminal chain component 9235
 Terminal set 4140
 Terminus of replication 3894, 3908
 Termite 3349
 Ternary number 5740
 Tesfatsions’s labour market model 181
 Tessellation 892, 894, 895, 4245
 Test set 1816
 Testing for linearity 446, 448, 452
 Testing method 1158
 benchmark 1159
 Zachary’s karate club 1159
 Testing object 1827
 Testing set 1827

Tetrahedral grids 7903
 Tetrahedral partition 5807, 5815
 12-Tetrahedral periodic minimizers 5970
 Tetrahymena pyriformis 2147, 2166
 QSAR models 7081
 Texas 7845
 TF *see* Transcription factors
 Thalamocortical system 1424
 Thematic maps 583
 Themes 580
 Theorem
 Alexeyev's 8559
 Ambrose–Kakutani 8568
 averaging 8642
 Bernoulli 3615
 Bochner–Herglotz 8556
 Dirichlet's 3031, 3036
 Floquet's 8636
 flowbox 6311
 Foiaş–Stratila 8566
 Garden of Eden 780
 Hartman–Grobman 6313, 8635
 KAM 8641
 Khinchine–Groshev 3031, 3033, 3037
 Krein 6594
 Leonov's 8565
 Lusternik–Fet 6606
 Lyapunov 6591, 8637
 Marsden–Weinstein 6597
 Moore and Myhill 783
 mountain 6603
 Noether 3872, 6311, 6597
 Poincaré 6312
 Poincaré-Bendixson 8645
 Poincaré's 6313
 Poincaré's theorem 8636
 relative equilibria 6598
 Siegel's 8636
 singular reduction 6598
 Souriau 6597
 spectral 8557
 stable manifold 8644
 Sternberg's 6313
 structural stability 8644
 weak closure 8564
 Weyl 5067

Theory
 biological 1883
 Cantorized singularity 6325
 cognitive approaches to development 1885
 content-driven approaches 1887
 core knowledge theory 1884
 developmental agent models 1896
 developmental behavioral genetics 1884
 dynamic field theory 1878, 1893
 epigenetic robotics 1897
 ergodic theory 3029
 ethological theory 1884
 evolutionary developmental psychology 1884
 Fischer's 1903
 Fischer's model 1893
 gauge 3876
 historical 1883
 KAM 6323, 6326, 6592
 learning-theoretically inspired approaches 1886
 metric number theory 3029
 neo-Piagetian theorists 1886, 1903
 neural Darwinism 1427
 normal form 6326
 of coordination 1543
 of embodied action 1887
 of fuzzy sets 4062
 of games 8188
 of human development 1876
 of information processing 1886
 of mind 1877, 1904
 of neuronal group selection 1424, 1427, 1428
 of patterns and complexity 394
 of perceptions (CTP) 4005
 of value 2285
 parametrized KAM 6326
 perturbation 6310
 Piaget's 1877, 1878, 1880, 1881
 psycho-dynamically inspired theories 1884
 resource-dependent competition-support systems 1888
 singularity 6311, 6322, 6324
 social learning theory 1887
 socio-culturally inspired theories 1884
 systems and dynamically inspired theories 1887
 transactional development 1883

- value 1428
 Vygotsky's 1877, 1879, 1880, 1883
 Werner's 1881
 Yang–Mills 3876
 Theory building 7850
 Therapeutic automaton 5643–5645
 Therapeutic effect 628, 630
 Therapy Process Questionnaire [TPQ] 7999
 Therapy process questionnaire (TPQ) 7998, 8000
 Thermal blob, polymer physics 6816
 Thermal conductivity 690, 700, 701, 1399, 2259, 4387
 Thermal effects 7669
 Thermal equilibrium 2813, 3370, 8752
 Thermal gradient 3275
 Thermal minority game 5590, 5595, 5597
 Thermal physics 7825
 Thermal properties 690
 Thermal rounding 2032
 Thermal stress
 global changes 1097
 mortality 1098
 Thermocapillary effects 5584
 Thermodynamic equilibrium 8381
 Thermodynamic formalism 6940
 ergodic theory 6941
 Thermodynamic limit 8712
 Thermodynamic phase 8712
 Thermodynamic state 8752
 Thermodynamics 2859, 3270, 3598, 4897, 5535, 5541, 8711, 9127, 9128
 Brownian motion 3599
 ecosystem 2705
 first law of thermodynamics 9127
 heat 3603
 non-equilibrium states 3601
 second law of thermodynamics 9127
 small systems 3598
 statistical mechanics 3598
 work 3603
 Thermoelectroelasticity 5922
 Thermohaline circulation 3
 Thermolysin 2132
 Theta program, tsunami warning 2669
 Thierrin–Vagner inverse 8297
 Thin film equation 3633
 Thinking, complex organizations 4564
 Third integral 404
 Thom 704
 Thomas–Fermi approximation 7315, 8579
 Thomas–Rashba interaction 9651
 Thomson 5474
 Thomson, James 5474
 Thomson's principle 1406
 Threat
 internalize 3111
 internalizing 3133
 occasional 3133
 probable maximum flood 3125
 threat continuum 3110
 Three-body collision 882
 Three-body problem 3832, 5960, 6673
 Three-body solution, eight shaped 5964
 Three-cycle 6005, 6007
 Three-dimensional equivariant minimizer 5968
 Three-dimensional flow
 in a bounded domain 5955
 liquids 5939
 steady bifurcation 5940
 Three-dimensional game of life 4245
 Three-dimensional microtrap, quantum computing 7223
 Three-dimensional periodic orbits 6439
 Three-phase traffic 9357
 Three-phase traffic flow theory 9446
 Three-phase traffic theory 9282, 9283, 9285, 9356
 Three-scale model 1651
 Three sisters volcanic center 9868
 Three-terminal interferometer with an embedded QD 7301
 Three traffic phases 9308
 Three types theorem 3320
 Threshold 164, 610, 1865, 2722, 6101, 6130, 7823, 8315
 continuum percolation 6508
 first 6130
 Threshold autoregressive model 443, 3443
 Threshold effects
 critical mass 4617
 transition thresholds 4618, 4620, 4621
 Threshold function 1817
 Threshold inversion 6130

- Threshold model 2745–2747, 3476, 3480, 3481, 5326, 5333, 5336–5339, 5341
 STAR model 5337, 5340
 TAR model 5337, 5338, 5340, 5344
- Threshold multiplication 332
- Threshold theorem 7339
- Threshold unit 1814, 1817
- Threshold value, polydisperse fractures 6514
- Threshold voter Automaton (TVA)* 4507
- Threshold voter automaton (TVA), majority 4508
- Thresholding 8673
- Thrombin 2134, 2145
- Thrust earthquake 2484
- Thümen's Isolated State 7957
- TIB *see* Tsunami information bulletin
- Tic-tac-toe automaton 5647–5651
- Tick size 5408
- Tidal bore 8465
- Tide gauge 9596, 9635
- Tideman's procedure 9956
- Tides 2601
- Tie indicator 5999
- Tie variables 6001
- Tierra 115, 334
- Tight binding 5751, 5754, 7483
- Tight-binding Hamiltonian 8601, 8608, 9138, 9140
- Tight-binding potential
- environment-dependent 9142, 9143
 - two-center 9139
- Tight M-wavelet frame 591
- Tightly-knit community (TKC) effect 5276
- Tilings
- acceptable for constrain 252
 - by local constraints 252
 - with Wang tiles 252
- Time
- complexity 6401
 - pre-movement 3153
 - re-scaling 6605
 - response 3153
- Time- and slip-predictable models 2564
- Time-averaged 695
- Time-axis, hyperfinite 6307
- Time complexity 3539, 7716, 7721, 8246
- Time-correlation functions 700
- Time delay 634, 636
- Time-dependent Hamilton–Jacobi equations 4556
- Time-dependent vectorfields 6628
- Time-discrete dynamical systems 161
- Time discrete scale invariance 7578, 7579
- Time division multiple access (TDMA) 2054
- Time DSI 7573
- Time evolution 1019
- Time-evolution operator 7389
- quantum simulation 7385
- Time-fractional diffusion equation 5220
- Time frequency analysis 2387, 2392
- Time-frequency analysis 2389, 2434
- Time frequency distributions (TFD) 7994, 7995, 8000
- Time graphs vs. eigenvalues or frequency response 8952
- Time headways 9382
- Time horizon 7841
- Time-independent Schrödinger equation 7128
- Time invariant 3526
- Time-of-flight 9684
- Time ordered product 6745
- Time-predictable 9840
- Time regularized long-wave (TRLW) equation 8116
- Time reversal 880
- Time-reversal symmetry 2809
- Time reversibility 5326, 5332, 5342
- Time scales 1873, 1875, 7603, 9779
- Time series 390, 6252, 7996, 7997, 7999
- biological fractals 3793
 - of traffic variables 9501
 - sparsely sampled 3585
- Time-series 280
- Time series analysis 3436
- nonlinear 3436
 - stochastic 3582
- Time-series data 4908
- Time-series processes 3464
- AR 3456, 3461
 - ARCH 3456, 3472
 - ARMA 3461
 - autocorrelation 3464
 - covariation 3464
 - GARCH 3456, 3461
- Time signal measurements 3575

Time-space diagram 3538
 TIME STEP 9036
 Time-stepped simulation 162
 Time-to-market 1975
 Time-to-volume 1975
 Time-varying 3527
 Time-varying expected return 3449, 3454
 Time-varying parameter model 5328, 5344
 Time-varying transition probabilities 2750
 Time-window component 2487
 Timescales 1542
 Timing jitter 6154
 TIP *see* Trapping invasion percolation (TIP)
 Tissue engineering 417
 Tissue lesioning 629
 Tissue P system 5525
 Tisza, Laszlo 2864
 Tit-For-Tat 8382
 TiTAN 2076
 Titin 7039
 Titin elasticity 7040
 Titin I27 domain 7035
 TMG 5590
 TNS action 3101
 Toda lattice 279
 Toddler 1901
 Toeplitz space 2237
 Toffoli gate, quantum computation 7379
 Toggle circuits 563
 Tokachi-Oki earthquake 4273
 Tolerance class 4417
 Tolerance relation 1796, 4413, 4416
 Tom Thumb algorithm 8076
 Tomita 8840
 Tomography
 computerized 9173
 conventional 9173
 seismic 9172
 X-ray 9173
 Tonks–Girardeau gas 9680
 Tonotopic maps 3341
 Tool use 1879
 Top cycle 9952
 Top-down causation 8046
 Topographic maps 3350, 3351
 Topography 3825
 Topological automata 8817

Topological chirality indices, QSAR modeling
 7075
 Topological complexity 4835
 Topological conjugacy 8893
 Topological defect 1277, 2025, 9680
 Topological divide 4349
 Topological dynamical system 5452
 Topological dynamics 3054
 Topological effect
 entangled polymer dynamics 6821
 polymer physics 6812
 Topological entropy 4737, 8896
 dimension-like characteristics ergodic theory
 3018
 Topological genericity 954
 Topological group, ergodic theory 3064
 Topological index (TI) 1303, 2197, 2203, 2204,
 6838
 Balaban 2205, 2208
 Bonchev 2204
 centric 2204
 Diudea 2206
 Estrada generalized 2207
 Gordon–Scantlebury 2204
 Gutman 2206
 Gálvez 2208
 Hosoya 2204
 information theoretic 2205
 interpretation 2210
 Kier–Hall 2205
 mean square distance 2205
 orthogonal 2208
 path-count-based 2206
 Platt 2204
 Randić 2204
 reverse engineering 2211
 Rücker 2206
 Schultz 2204
 SMILES notation based 2208
 triplet 2206
 variable 2208
 Wiener 2203
 Zagreb 2204
 Topological information 4827
 Topological invariants 9269
 Topological models 724
 Topological order 2026

- Topological pressure, ergodic theory 3018
 Topological quantum computing 7390
 Topological reconfigurations 8529
 Topological rigidity 3104
 Topological sort 8251
 Topological space 4352
 Topological trapping 5081
 Topologically transitive 9234
 Topology 724, 3831, 3930, 4313
 collapse 505
 generation 4940
 modeling 4938
 of uniform convergence 1030
 rules 8843
 social network 180
 strong and weak 5442
 usual 1030
 weak 1030
 Toppling 8035
 Toral automorphisms 997
 Torque density 8106, 8107
 Torque dipole 8107, 8108
 Torres Quevedo, Leonardo 5475
 Torsade de pointes (TdP) 2125, 2166
 Torsional forces 2841
 Tortuosity 2687
 Torus 1932, 5084, 8930
 invariant 1934
 lower-dimensional 1943
 maximal 1943
 resonant 1943
 Total adjacency 4829
 Total clearance 2155
 Total-ordering, definition 6288
 Total relation 9234
 Total scattering coefficient 7915
 Total scattering cross-section 7915
 Total stability 5081
 Total variation (TV) 10038
 Total variation (TV) restoration 10033
 Total walk count 4833
 Totalistic 8030
 Totally ergodic 2923
 Totally ordered field 6293
 Tourism 7842
 Tourism demand 7845
 Tournament 6249, 9946
 majority 9943, 9945, 9949
 Tournament equilibrium 9953, 9958
 Tournament matrix 6249
 Tournament solutions 9945, 9949, 9952
 Tower transformations 3060
 Tower, Rokhlin 8564
 Toxicity of organic chemicals 2145
 Toxicology, QSAR models 7081
 Toy chemistry 336
 Trace formula 7164, 7168
 Trace intersections density, fracture networks 6514
 Traces 6514
 of the attractor 9233
 Tracking 4687, 9079
 adaptive tracking 9079
 dynamic inversion 9079
 tracking via internal models 9079
 Tractability, neoclassical economics 179
 Trade deficit 2818
 Trade size 5408
 Traders, market microstructure 5397
 Trading mechanism, order-driven 5393
 Trading network game, Tesfatsions's 181
 Trading process, tree diagram 5399
 Trading volume 98, 5407
 NYSE 5407
 Traditional 8955
 Traffic assignment in a traffic network 1177
 Traffic breakdown 9296, 9297, 9302, 9316, 9355
 Traffic congestion 1177, 3945, 9403
 Traffic control 3945, 5791
 network-oriented traffic control systems 3956
 Traffic control centers 9526
 Traffic control parameters 9379
 Traffic data, phase space 3589
 Traffic flow 1177
 stochastic processes 3587
 Traffic flow interruption 9380
 Traffic flow interruption effect 9309
 Traffic flow interruption intervals 9398
 Traffic flow management 234
 Traffic flow model 3950, 9303
 Traffic flow theory 1179, 9283
 Traffic growth 239
 Traffic jam 1179, 3945

- Traffic management 1178
 Traffic model 876
 Traffic modeling 9445
 macroscopic 9446
 mesoscopic 9446
 microscopic 9446
 Traffic phase definitions 9357
 Traffic routing 9430
 defined 9430
 Traffic states 3589
 Trailing spiral arm 414
 Training 2143, 8377
 Training object 1827
 Training set 1827
 Trajectory 1552, 3263, 4904, 6489
 Boolean networks 1199
 Brownian 3785
 convergence 1203
 coordinating elements 1552
 optimal 1502
 Trajectory formation 1557
 Transaction cost 6978
 Transactional relationship 1901
 Transcranial magnetic stimulation (TMS) 1437, 8004
 Transcription 418, 544, 3894, 3968, 4161, 4169
 antisense 3969
 non-coding RNA 3967
 Transcription factors (TF) 528, 529, 535, 539, 540, 542, 543, 721, 1182, 5661
 autoregulatory 528, 529, 535
 Transcriptional regulation network 5656, 5661
 Transcriptome 1181
 Transcriptomics 5537, 9099
 Transcritical bifurcation 5305
 Transducing automaton 5645
 Transfer entropy 1434
 Transfer function 1813, 1817, 2382, 2475, 8955
 Transfer map 3100
 Transfer matrices 1410
 Transfer operator
 multiwavelet 5844
 Ruelle's Perron–Frobenius theorem 6948
 Transfer principle 2940
 Transfer, heat 6962
 Transferable utility game 1511
 Transfinite fractals 3933
 Transformation 6315, 6596, 6653
 bond-to-site 6585
 canonical 6320
 elementary 1870
 equivariant 6318
 finitely fixed 4991
 isomorphic to Bernoulli shifts 4988
 loosely Bernoulli 4991
 minimal self joining 4989
 non-invertible 4992
 normalizing 6310
 not isomorphic to Bernoulli shifts 4989
 pignistic 6934
 preliminary 3303
 scale 3861, 3864, 3877
 σ -preserving 6318
 star-triangle 6580
 $[T; T^{-1}]$ 4985
 Transformation process, cutting and stacking 4990
 Transforming 4188
 Transfractals 3933
 transfractal dimension 3933
 Transience 7522
 Transient deformation 1701
 Transient growth 15
 Transient lengths 65, 70
 Transient pressure disturbance 9900
 Transient random walk 1396
 Transient states 64
 Transient time 2721
 TRANSIMS 162
 Transistor 420, 7401
 Transition 620, 621, 1132, 1898, 3863, 3864, 7823
 between different traffic states 9389
 between existing traffic phases 9389
 between traffic phases 9389
 continuous 620
 depinning 1132
 electron shelving detection 7230
 first-order 620
 hybrid 621, 622
 Transition diagram 5634
 Transition function 169, 3234, 5634
 Transition interval 2740
 Transition metal 1317, 1318
 adsorbate interaction 1318

- center 1318
 d-band 1318
 s-band 1317
 Transition operator, multiwavelet 5844
 Transition probability 2749, 7521, 9421
 Transition rules 5874
 Transition semigroup 6231
 Transition state 1314, 1317, 1321, 1324, 1325, 1330
 early 1314
 late 1314
 structural analysis 1324, 1325, 1330
 Transition-state theory 1312
 Transition zone
 percolation 6513
 Transitional metal
 early 1307
 late 1307
 Transitive points 9234
 Transitive system 9248
 Transitivity 999, 6005, 6007, 8270, 8284, 8324, 8326, 9225
 Translation 418
 Translation vector 46
 Transmission coefficient 4966, 4970
 Transparency 5409
 Transport 6961, 8600, 8606
 heat 6961
 mass 6961
 spin-dependent transport 8598
 Transport coefficients 990–992, 1000, 1001, 1008, 1398, 4386, 4388
 continuum percolation 6507
 Transport processes, geological 6505
 Transposable elements 4164
 defence against 4165
 derived cellular features 4165
 DNA transposons 4164
 dynamic 4165
 gene duplication 4166
 LINE1 4164, 4166
 regulatory network 4166
 retrotransposons 4164
 Transversal 6311, 8644
 Transversal gates 7337
 Transversality condition 5305, 6276
 Trap frequency, quantum computing 7222
 Trap models 4231
 Trapped ion
 distributed quantum information 7244
 quantum computing 7218
 Trapping invasion percolation (TIP) 4948
 threshold 4950
 universality class 4949
 Trapping threshold, invasion percolation 4955
 Traps 7523
 Trash-collecting 3691
 Travel decision behavior 1177
 Travel time curve, infrasonic wave 4842
 Traveling salesman problem 6408
 Traveling wave solutions 5144, 5146
 Traveling waves 2721
 Traversability, component 2739
 Treadmilling 1746, 1752, 1765, 1766
 Treadmilling actin 1746
 actin filament 1746
 Treatment effect models 5560
 average treatment effect 5561
 potential outcome model 5559
 Rubin causal model 5561
 Treatment effectiveness 8001
 Treatment evaluation 5555
 counterfactual 5557
 Treatment of mental health diagnosis
 modeling 4573
 Treatment of physical conditions
 modeling 4571
 Tree 1254, 1935, 4487, 4488, 6668
 algorithm 8694
 cluster 1939
 diagram of the trading process 5399
 finitely determined transformation 4992
 fractal dimension 3783
 height 71, 72
 matrix 3740
 number 6668
 renormalized 1942
 self-energy cluster 1939
 tree of life 3865
 value 6668
 very weak Bernoulli transformation 4992
 Trefoil knots 7045
 Treiber et al. intelligent driver traffic flow model 9335

- Tremor 2610
 Trench 9583, 9585
 Trend 9836
 detections 3577
 Trend-impact analysis 7835
 Tri-gate MOSFET 7408
 Triad significance profile (TSP) of networks 5698
 Triadic 6007
 Triads 8241, 8270
 Triangle 8324
 density distribution 7516
 Triangular connectivity 8254
 Triangular lattice 8714, 8715, 8726, 9680
 Triangular network 8254
 Triangular tessellation 892, 893
 Triangulation refinement 5801
 Alfeld refinement 5807
 Clough–Tocher 5801
 Powell–Sabin 5801
 quadrangulation 5807
 Wang refinement 5802
 Worsey–Farin refinement 5814
 Trigger 7605
 Triggering 6958, 6964
 dynamic 2600
 Triggering mechanism 6957
 Trip distribution 9451
 gravity model 9451
 Tripartite scheme 1543
 hierarchy of timescales 1543
 Triple density similarity measures 7453
 Triple similarity measures 7470
 Triplestores 8085
 Tristability, networks 1193
 Trivial symmetry 5972
 Triviality conjecture 6665
 TRNA sequence, entropy 496
 Trochoid 9978
 Trophic roles 2732
 Tropic cascade 2718
 Trotter formula 7099
 quantum simulation 7385
 True anomaly 6676
 True in GM 4401
 Truncated power law 2716, 5035
 Truncation 6310, 6315, 6655
 Trust 8088
 evolution of 5686
 Trustworthiness 4048, 4049
 Truth set 4400
 Truth table
 CNOT quantum gate 7234
 Truthful scheduling 5518
 Truthfulness 5512, 5514, 5516
 Trypanosoma cruzi 2147
 Tsallis entropy 5260
 Tschirnhaus-transformation 712
 TSK model 4890
 TSP *see* Triad significance profile
 TST *see* Two-scale similarity transform
 Tsunameters 9635
 Tsunami 1220, 2451, 2476, 2483, 2491, 2658,
 2659, 8113, 8121, 8465, 8505, 8855, 9578,
 10047, 10055
 infrasound 4839, 4846
 interaction with the coastline 4847
 Miyagi–Oki earthquake 4846
 propagation 2659
 Sumatra earthquake 4846
 tsunami wave heights 9587
 Tsunami alarms 2492
 Tsunami early warning 2491, 2493
 Tsunami early warning system 9582, 9590, 9592
 Tsunami earthquakes 2484, 2660, 2669, 9577,
 9594, 9639
 model 9588
 slow character 9580
 Tsunami forecasting and warning 1220
 Tsunami generation 9633
 Tsunami hazard 2494
 Tsunami information bulletin (TIB) 2661
 Tsunami infrasound 4845, 4848
 Tsunami inundation 1220
 Tsunami magnitude 9639
 Tsunami observations 9635
 Tsunami propagation 9634
 Tsunami warning 2484
 a fixed regional bulletin 2661
 an expanding watch/warning bulletin 2661
 future directions 2671
 local earthquake magnitude methods 2665
 mantle magnitude (M_m) method 2667
 M_{wp} method 2666

- rapid estimates 2657
 retroactive performance 2662
 rupture slowness estimation 2669
 teleseismic magnitude methods 2666
 theta program 2669
 Tsunami warning center operations 2660
 Tsunami warning centers 2660
 Tsunami waves 2659
 Tsunamigenesis 9585, 9586
 Tsunamigenic earthquake 2367, 2660, 9578, 9639
 Tube model, entangled polymer dynamics 6822
 Tumor cell-extracellular matrix (ECM)
 interactions 914
 Tumor cell migration 914
 effect of heterogeneous environments 918
 influence of the extracellular matrix 917
 Tumor invasion
 cell processes 914
 cellular automata model 914
 cellular scale 915
 influence of metabolic changes 919
 metabolism and acidosis 919
 models 916
 molecular scale 915
 tissue scale 915
 Tumor locus 919
 Tumor morphology, invasive 914
 Tumor spheroid, multicellular 917
 Tuned damper 2333
 Tuning parameter 5021
 Tunneling between wells 6756
 Tunneling energy 9692
 Tunneling junction 9715
 Tunneling spectroscopy 7311, 7319
 linear transport regime 7311
 non-linear transport regime 7311
 source-drain bias 7311
 Tuple space *see* Linda coordination model
 Turbulence 23, 3643, 3831, 6489, 8947
 cluster 6490
 Eddy 6489
 Navier–Stokes equations 5954
 nonscaling behavior 3594
 rupture 6490
 stick-slip instability 6490
 stochastic processes 3590
 vortex cascade 6489
 Turbulence modeling 3650
 Turbulent flow 6489
 Turbulent regime 9421
 Turbulent velocity fluctuations 7019
 Turing equivalent 1376
 Turing machine 169, 271, 279, 280, 287, 288, 745,
 800, 904, 2090, 3354, 5467, 6388, 6401, 7155,
 7156, 7158, 7161, 7162, 7683, 7705, 8842, 9127,
 9129, 9159, 9162
 halting problem 9160
 in artificial chemistry 333
 logspace 6401
 quantum 7155
 reversible 7683, 7705
 universal RTM 7709
 Turing patterns 3349
 Turing power 288
 Turing structures 3624
 Turing, Alan M. 923, 3349, 4134, 5467, 5478,
 7251, 8940, 8942
 Turing, intermediate 764
 Turing’s artificial chemistry 327
 Turkey 2398
 Turning points 6748
 Tutte polynomial 7111
 TV wavelet inpainting 10042, 10045
 TWINKLE 5478
 Twist 9271
 Twist mappings 5079, 5087
 Twist vector 2636
 Two-ballot procedure 9948
 Two-body collision 882
 Two-body problem 5960, 6436
 Two channel filter bank 10023
 Two-class society 2819
 Two-class structure 2813
 Two-cocycle 5486
 Two-cocycle identity 5486
 Two-dimensional 3557
 2D Brownian motion 8727
 2D chirality, QSAR modeling 7074
 Two dimensional electron gas 8608
 Two-dimensional electron gas 1018
 2D electron layer 8581
 Two dimensional electron waveguide 7292
 Two-dimensional flow, liquids 5930, 5941
 Two-dimensional KdV 9994

2D layer 8584
 2D quantum gravity 8724
 2D spin glass 8713
 Two-dimensional turbulence 8726
 2D turbulence 8713
 Two-dimensional wave equation 9986
 Two-forms, curvature 5505
 Two fracton relaxation 2258
 Two-frequency mutual coherence function 7921
 Two-gene circuit, expansion 1190
 Two-level correlation function 7514, 7515
 Two-mode data 8272
 Two-mode network 8258
 Two node simulation 156
 Two-phase structure 5589
 Two-qubit controlled Z-gate 7233
 Two-qubit gate 7237
 Two-qubit interaction 7231
 Two-round procedure 9948, 9955
 Two-scale similarity transform 5853
 Two-sided 3545
 Two-sided matching model 4097, 9654
 continuous 9654
 discret 9654
 hybrid 9655
 Two-sphere 2009
 Two-spin cluster 8595
 Two-state quantum system, quantum computing 7220
 Two-valley system 8579, 8585
 Two-valuedness 3871
 Twofold integral 232
 Tygar 5472
 Type 1 diabetes 9097
 Type-1/type-2 fuzzy sets 4411
 Type-2 fuzzy logic 4009
 Type-2 fuzzy set 4011, 7739
 Type-2 fuzzy systems 4011, 4089
 generalized 4013
 Type of an agent 4788
 Type-reduced set, interval type-2 fuzzy logic system 4016
 Typogenetics used in artificial chemistry 333
 Tyrosine kinase 2121

U

U-m 7460, 7463, 7466, 7468
U-Molecule 7460
 U-Shaped growth 1890
 U-Statistics 6260, 6261, 6266
 UC models 2752
 UE assignment 9437
 Beckmann formulation 9437
 UE model 9439
 Beckmann's 9439
 mathematical program 9439
 Uehling–Uhlenbeck equation 7818
 Ugi multicomponent reaction 2117
 Ulam, Stanislaw 779, 849, 7155
 ULF electric signals 2569
 Cox regression model 2570
 RELM testing center 2570
 self-exciting (Hawkes type) process 2570
 Ultimate-reals, construction of 6292
 Ultimatum game 6648
 Ultra-filter, infinite set 6292
 Ultrasensitivity 485
 Umeo 3542, 3552, 3553, 3564
 Umeo, Maeda and Hongyo 3549
 UMF *see* Upper membership function
 Unanimity 9945
 Unanimity game 4105
 Unbalanced panel data 2780
 Unbiased fuzzy-valued estimator 8688
 Unbiased random walk 8714
 Uncanny valley 1121
 Uncertainty 2450, 3860, 4317, 4318, 6568, 7833, 8315, 9434
 aleatory 4049
 environmental 7838
 epistemic 4049
 extrinsic 4317
 future 7837
 fuzzy logic 4009–4013, 4015, 4017, 4513
 interdependence-induced 7839
 intrinsic 4317, 4318
 management of 7849
 mixed probabilistic/non-probabilistic 4048
 neoclassical economics 178
 strategic 7836
 type-2 fuzzy logic 4015

- Uncertainty principle 3351
 Uncertainty propagation 6936
 Unconventional computing 9705
 Uncorrelated process (white noise) 369
 Uncoupled 5182
 Uncoupled mode-space NEGF 7485
 Uncovered elements 9958
 Uncovered interest parity 5426
 Uncovered set 9952
 Undecidability 762
 Undecidable 762, 764, 5468, 5473
 Undecidable mechanical simulation problem 5473
 Undecimated wavelet transform 6358
 Under-dispersed 9838
 Underground explosions 2476
 Underground nuclear explosion 2485
 Undetermined form 6290
 Undirected graph 5268
 Undirected motif 507
 Undular bore 8116, 9989
 Unearned income 2285
 Unemployment
 acceleration 3301
 rate 5332, 5333, 5341–5343
 Unequi-spaced FFT 1729
 Unfoldases 7042
 Unfolding 711, 5777
 Unfolding dimension 703
 Unfolding morphism 703
 Unfolding of homoclinic tangencies 964
 Unified modeling language (UML) 353
 Uniform continuous function 3256
 Uniform convergent sequence 3256
 Uniform graph 8214
 Uniform hyperbolicity 4724
 Uniform measure 2982
 Uniform Nash equilibrium 7633
 Uniform random sampling 5536, 5542, 5544
 Uniform sampling 5545
 Uniform spanning tree 8710
 Uniform value 7633
 Uniformizing map 8710
 Uniformly distributed 2938
 Uniformly elliptic 7521
 Uniformly expanding maps 959
 Uniformly expanding Markov map 6950
 Uniformly hyperbolic diffeomorphisms 959
 Uniformly hyperbolic systems 2968, 4730
 Anosov Systems 2966
 Axiom A Systems 2967
 Geodesic Flow on Manifold of Negative Curvature 2965
 Horocycle Flow 2966
 Markov Partitions and Coding 2966
 Uniformly rigid 9237
 Unimodal maps 962
 Uninformed traders 5397
 Unintended consequences 7052
 secondary crisis 7053
 Union 4148, 4877–4879
 type-2 fuzzy sets 4012
 Union of two fuzzy sets 4067
 Unipotent matrix 3105
 Uniquely ergodic 2937, 3105, 5457
 Uniqueness 7829
 Unit quaternion 58
 Unit shell 7429
 Unitarily equivalent 5464
 Unitary 7253
 Unitary extension principle 6897
 Unitary operator 5464
 nonsingular system 3070
 Unitary representations, locally compact groups 3079
 United States 2398
 Universal 703, 712
 quality 906
 Universal amplitude 7001
 Universal approximation 3354–3356
 Universal approximation theorem 1818
 Universal approximator 2143
 Universal behavior 1443
 Universal belief space 430, 431
 Universal CA 8886
 Universal computation 1384, 3354, 5869
 Universal computer 285
 Universal constructor 5439
 Universal formula for stabilization 8625
 Universal history 3273
 Universal model for computation 169
 Universal modeling schema 8190
 Universal property 6407, 8711
 Universal quantum computation 7379

- Universal representation theorem for expansive cellular automata 2987
- Universal scaling function 5022, 5035
- Universal set 4061
- Universal threshold 8674
- Universal Turing machine 121, 7709, 8069, 8191
- Universal type space 431
- Universality 758, 903, 905, 1126, 1402, 1404, 2821, 3314, 3743, 5021, 5030, 5525, 6576, 6772, 6804, 7167, 7823, 9944
computational 901, 903
consequences 905
intrinsic 758, 901, 906
- Universality class 609, 2023, 5026, 5035, 6412, 6772, 8712
- Universality theorem 7179
- Universe 1865, 3272, 4877
- Universe of discourse 4061
- Universe of objects 4417
- Unmanned air vehicle (UAV) 3688, 4758
- Unmanned autonomous systems 5615
- Unmanned underwater vehicles – UUVs 3688
- Unobserved components (UC) model 2751, 5330, 5335, 5337
- Unobserved effect 2772
- Unobserved heterogeneity 2770, 5565
gamma distribution 5566
independently 5566
mixture model 5567
omitted variable 5561
- Unobserved shocks 2771
- Unperturbed system 6310
- Unpredictability 4909
- Unpredictable 8869, 8870, 8885, 8886
- Unstability in the quadratic family 970
- Unstable and stable manifolds 990
- Unstable manifold 2265, 4516, 4727
- Unstable mode 8930
- Unstable voids 611
- Unsupervised feature selection 5353
- Unsupervised learning 1816, 1822, 1992, 2162, 4873
- Untrusted code, mobile agents 5610
- Update 10010, 10022
parallel 3158
synchronous 3158
- Update order 165
- Upper approximation 4425, 7776, 7788, 7801
singleton upper approximation 7802
subset upper approximation 7802
- Upper critical dimension 5028
- Upper density 2947
- Upper fractal limit 662
- Upper membership function (UMF) 4013
- Upper semicontinuous 8682
- Upperbound 1683
- Ur-element, definition 6302
- Urban 3126
- Urban dynamics 8997
- Urban simulation models 7954
- Urban traffic network 1178
- Urbanism 7953
- UrEDAS 2398
- URI (uniform resource identifier) 8085
- US business cycle 442
- US Census Bureau 2815
- U.S. Centers for Disease Control and Prevention (CDC) 4578
- US geological Survey (USGS) 9866
- US government bond market 5395
- USA 7846, 7848
- User equilibrium 9434
traffic assignment 9437
traffic assignment, incremental 9437
- Usuality constraint, fuzzy logic 3999
- USV 8795
- UTA (urban traffic analysis) 9507
- Utilitarian Borda-score criterion 3333
- Utilitarianism 9936, 9939
- Utility 4855
- Utility function 1669
expected utility 7536
- Utility of voting 9939
- Utility problem 5188

V

- Vacant dislocations 2649
- Vachaspati–Vilenkin algorithm 1648
- Vacuum cleaners 3690
- Vagueness 4060
type-2 fuzzy logic 4011
- Valence force field 5753
- Valente, Tom 8273

- Valid computations 817
 Validation 174, 216, 217, 3303, 6802, 7017, 7803, 9000, 9001, 9003
 Validation methods 9004, 9012
 Validation set 1816
 Validity 9000, 9001, 9003
 Valley-degeneracy 5751
 Valley-splitting 5775
 Valuation 3457, 3458
 constant P/E model 3459
 Donaldson–Kamstra (DK) method 3457, 3460, 3461, 3464
 free-cash-flow method 3459, 3461
 fundamental 3456, 3458, 3459
 Gordon growth model 3459, 3461
 relative value method 3459
 residual income method 3459, 3461
 Valuation functions 5517, 5521
 Value 7631
 critical 6600
 Value-at-risk 3429
 Value chain
 customer-supplier 7842, 7849
 jet ski 7847
 Value chain components 7849
 Value-chain management structure, generic 7846
 Value-chain participants 7845
 Value function 1503, 6219, 9105
 Value stocks 3391
 Van-Allen belts 32
 Van-Allen radiation belts 22
 Van-der-Corput trick 3088
 Van der Pol 7603
 Van-der-Pol equation 3838
 Van-der-Pol oscillator 5725
 Van der Waals 696, 697, 699
 Van-der-Waals equation 6664
 Van-der-Waals forces 3633
 Van der Waerden's theorem 9244
 Van-Hove intermediate scattering function 1004
 incomplete 1005
 VAN method 2622–2624
 conductive channel model 2630
 Ioannina station 2624
 seismic electric signal (SES) 2623
 seismic electric Signals (SES) 2622
 selectivity 2624
 selectivity map 2624
 SES 2632
 SES activity 2623, 2624, 2626
 VAN relation 2624
 VAN-type monitoring 2625
 Van Nuys 7-story hotel 2389
 Van Nuys building 2393
 Vanishing 6290
 Vanishing moment 591, 10034
 Vanishing points 58
 Vanishing viscosity method 6218, 6220, 6225
 Vannevar Bush 273
 van't Hoff–Arrhenius equation 1312
 Vapor pressure 2144
 VAR *see* Vector autoregressive model
 VAR model 5329, 5330, 5344
 Variability 1898, 1899, 1904
 Variable 4491
 auxiliary constant 7843
 constraint 3998
 converter 7843
 hidden 4491
 locally meaningful 7850
 stochastic 3862
 type-2 fuzzy sets 4013
 Variable focus liquid lens 5585
 Variable sampling 4861
 Variance 6145
 and moments 3317
 Variance gamma distribution 3422
 Variants of the minority game 5596
 variants 5589
 Variation
 of parameters 1032, 1037
 seasonal 7843
 Variation order 1849
 Variational equations 6430, 6433
 Variational formulation, Navier–Stokes equations 5931
 Variational iteration method 5144, 5165, 5168
 Variational methods 7347
 Variational principle 958, 966, 3041
 ergodic theory 6945, 6946, 6949
 Variational QQSPR 7456
 Variations formula 1032
 Varopoulos N 787
 Varshavsky 3547

- VC-dimension 5212, 5213, 5216
 VCA 5778
 VCG 5510, 5514, 5519
 Vector autoregression (VAR) model 2750
 Vector autoregressive (VAR) model 5402
 Vector-borne tropical infectious diseases, increase by climate change 1101
 Vector field 1030, 2261, 3257, 4517
 autonomous 6590
 C^0 equivalent 6698
 equivariant 6597
 germ-equivalent 6698
 Vector moving average (VMA) representation 5402
 Vector of cost shares 1664
 excess 1667
 stable 1664
 Vector of final system's state 1622
 Vector of initial state 1622
 Vector payoff 7637
 Vector potentials 9275
 Vector semispace 7428
 Vector space 703
 Vectorization 5757
 Vehicle
 candidate 9735
 field 9735
 Vehicle cluster in free flow at the bottleneck 9285
 Vehicle communication protocols 2054
 Vehicle stops 9457
 Vehicular traffic 1179, 9282, 9357
 Vehicular traffic congestion 9304
 Vehicular traffic management 1180
 Velocity broadband record 2482
 Velocity estimation 4767, 4770
 Velocity increments 3651
 Velocity pulse
 earthquake 2539
 microearthquakes 2546, 2547
 slow initial phas 2544
 Velocity-strengthening 10047, 10052, 10055
 Velocity Verlet algorithm 695
 Velocity waveforms, large earthquakes 2543
 Velocity-weakening 10047, 10051
 Venice's Carnival 9419
 Venn diagram 8268
 entropy 498
 Vensim 9015
 Vent 9889
 Venttsel condition 6226
 Verhulst equation 1889, 6616, 6617
 Verhulst, François 7843
 Verifiable information 8127
 Verification 174, 4855
 Verification functions 6271, 6277
 Veristic constraint, fuzzy logic 3999
 Versal 713
 Versal unfolding 6632
 Vertex 6240, 6241, 8246, 8267, 8270
 adjacent 6241
 and edge orbit's information 4827
 degree 2201, 8252
 in-degree 8252
 incident 6240
 initial 6241
 out-degree 8252
 reachable 8250
 strongly connected 8250
 terminal 6241
 weakly connected 8250
 Vertex eccentricity 4832
 Vertex orbits 4827
 Vertex similarity 1144
 Vertical hostility 5610
 Vertical projection 5503
 Vertical slice, type-2 fuzzy logic 4013
 Vertical space, definition 5502
 Vertical stability 6432
 Vertical transmission 3213
 Vertical vectors, definition 5504
 Very long baseline interferometry 1691
 Vibrational cooling, quantum computing 7226
 Vibrational coupling, quantum computing 7231
 Vibrational density of states 2255
 Vibrational mode, quantum computing 7232
 Vibrational quanta 7239
 Vibrational state decoherence 7239
 Vibrio fischeri 2145, 2147
 Victoria 3135
 Video games 1340
 Video shot 5742
 Video tracking 6479
 VIM 5144, 5146, 5153, 5156, 5158
 Violent relaxation 389

- Viral protein linear (VPL) actuator 9751
 Virial series 6664
 Virtual characters 1335
 Virtual enterprise network (VEN) 7846
 Virtual fidelity 1338
 Virtual human(s) 1336
 Virtual machines (VM) 5607
 Virtual screening 7079
 QSAR based 7071
 Virtual screening of chemical libraries 2120
 Virtual world(s) 1335
 Viscoelastic 9790
 Viscoelastic phase separation, polymeric fluid 6828
 Viscoelasticity, polymer physics 6819
 Viscosity 1611, 9766, 9771, 9776, 9787
 bacterial colonies 3788
 Newtonian 9787
 non-Newtonian 9787
 of gels 6555
 Viscosity solutions 1505, 4547, 6217–6219, 6272, 6279
 Hamilton–Jacobi equations 4546, 4558
 semicontinuous 6225
 Viscosity subsolution 6223
 L^p 6226
 Viscosity test functions
 Hamilton–Jacobi equations 4551
 Viscous expansion time 6960
 Viscous fingering 3725, 6481
 Vision 8200, 8201, 9415
 Visual complexity 1256
 Visual cortex 3352
 Visual servo control 43
 2.5D 44
 homography-based 44
 image-based 44
 position-based 44
 Visual stimulation paradigm 8004
 Visualization 2357, 2358, 2360, 2366, 8274, 8283
 Vlasov–Fokker–Planck equation 5243
 VM *see* Virtual machines
 VMA *see* Vector moving average representation
 Vogel–Fulcher–Tamman law 4212
 Voice-onset time 2315
 Void instability 613
 Volatile 6955, 9785, 9790
 Volatility 2247, 3439, 3476, 3477, 3479, 3486, 3492–3494, 3498, 5412
 Volatility and financial market innovation
 variance swaps 8807
 VIX index 8807
 volatility derivatives 8807
 Volatility and jump risk premium, empirical evidence 8793
 Volatility clustering 96, 3376, 3425, 3818, 4115
 Volatility risk premium
 open questions 8808
 Volcanic 9785
 Volcanic activity, eruption signature 4851
 Volcanic conduit 9769
 Volcanic crisis 9862, 9865
 Volcanic eruption 3824
 spectroscopy 4851
 Volcanic eruption detection 4852
 Volcanic explosivity index (VEI) 9785, 9832
 Volcanic sound, modeling 4849
 Volcano 1222, 1314
 infrasound 4839
 Kilauea 8855
 Mount St. Helens 9765, 9773
 Santiaguito 9773
 Shiveluch 9777
 Soufrière hills 9765
 Volcano disaster assistance program (VDAP) 9867
 Volcano hazards 9862
 Volcano infrasound 4848, 4852
 basic principle 4848
 Volcano monitoring 9862, 9869
 baseline monitoring 9862
 Volcano plot 1314, 1316
 Volcano risk 9862
 Volcano-seismic signal 9818
 Volcano seismicity 9900
 Volcano seismology 1222, 9901
 Volcano unrest 9862, 9864, 9866, 9869, 9870
 Vollmar 3542, 3552
 Voltage 6102
 Voltage distribution 3745
 Volterra series 1029, 1037
 Volume preserving 6318
 Volume, excluded 6505
 Voluntary movements 1557

Voluntary participation 1671
 von Kármán-type ACF 7920
 von Neumann 418, 7251, 8869, 8878, 8885
 von Neumann algebras, ergodic theory 3078
 von Neumann architecture 2091
 von Neumann machine *see also* Assembler automaton
 parallel 334
 von Neumann mean ergodic theorem 3058
 von Neumann–Morgenstern 1519
 von Neumann neighborhood 872
 von Neumann theorem 6232
 von Neumann, John 779, 780, 783, 784, 1510,
 2861, 7155, 8067, 8381
 universal Constructor 8067
 Voronoi cells 7898
 Voronoi diagram 3349, 9710
 Voronoi tessellation 1802
 Vortex 9689
 Vortex core 9693
 Vortex filament 3648
 Vortex glass 6413
 Vortex pair 1274, 9691
 Vortex solutions 3646
 Vortex structures 3645
 Vortex unbinding 1275
 Vortices 1272, 2025, 6472
 Vorticity alignment 3646
 Vorticity structure 8727
 VOS model 1642, 1649
 Voter model 6384, 7577, 8385
 Voting 5320
 0–99 voting 9954
 Voting cycle 9935
 Voting game 1521
 simple majority 1522
 Voting procedure 9943
 Voting rule 776, 9934, 9935, 9937–9939
 Voting systems 4097
 Voting theory 9943
 Vowel 2310
 Vulcanian 9807
 Vulcanization 7822
 Vulnerability 3110, 3113
 exit route 3114
 Vygotsky 1884, 1896

W

W-Phase 9582
 W-State, quantum computing 7244
 Waddington's epigenetic landscape 1193
 formalism 1194
 Wage employment 2285
 Waiting time 4231
 Waiting time PDF 5220
 Waksman 3539, 3540
 Wald maximin criterion 6932
 Walk 2201, 2211, 4833, 6239, 6241, 6784, 8250
 biological fractals 3786
 closed 6241, 8250
 length 8250
 random 3860
 Walrus 1256
 Wandering 5458
 Wandering effect 7920
 Wang 5472, 5478
 Wang tile 5635, 9159, 9162
 aperiodic 9159
 deterministic 9165
 periodic tiling 9159
 tiling 9159
 tiling problem 9160, 9163
 War of attrition 3188, 8652
 Ward identity 8581
 Wardrop's first principle 9436
 Warehouseman's problem 5470
 Warning 3111, 9862
 active warning image 3134
 cyclone 3128
 spreading 3137
 timeliness 3134
 traditional weather warning 3136
 Warning map 3136
 Warranty 8127
 Wasserman, Stanley 704, 8269, 8275
 Water 852, 9874
 Water availability 7599
 Water resource 1073
 Water-SWCNT system 696
 Water tank experiments 8121
 Water wave equations 9974, 9980
 Water wave observations 8121, 8122
 Water wave problem 6721

- Watson's theorem 6740
 Watts, Duncan 8269, 8277
 Wave 2476, 8115, 8118, 8122, 9892, 9969
 density 3154
 “freak” or “giant” 8498
 function 3872
 linear 8480
 longitudinal wave 2476
 nonlinear 8480
 ring 886
 shock 3154
 spiral 886
 traveling 8480
 Wave chaos 7172
 Wave dispersion 8113, 8115, 8116, 8123
 Wave equation 1487, 1492, 1493, 2042, 2043,
 6121, 6231, 6709
 boundary control 4806
 controllability 4806, 4808
 nonlinear 2048
 strongly stable 1494
 (uniformly) exponentially stable 1494
 Wave function 3353, 3876, 7382
 biquaternionic 3876
 nondifferentiable 3874
 Wave magnitude calibration function 2480
 Wave maker 6208
 Wave of synchronized flow dissolution 9391
 Wave of upstream transitions 9389
 Wave packet 2042, 3353, 8105
 Wave propagation 7894
 Wave propagation in complex media: path and site
 Effects 4453
 incoherently scattered wave energy 4454
 probabilistic seismic hazard analysis 4464,
 4466
 radiative transfer theory 4457
 scattering in inhomogeneous media 4456
 seismic coda 4456
 wave propagation in random media 4455
 Wave travel time analysis 2392
 Wave travel times 2390
 Waveform inversion 7895, 9909
 Wavelength 2485
 critical 2485
 Wavelet analysis 3762
 Wavelet based minimal energy methods 10041
 Wavelet coefficients 10032
 Wavelet functions 2382
 Wavelet masks 592
 Wavelet thresholding 10035
 Wavelet transform 1719, 2384, 3893, 3894, 3897,
 6352, 6357, 8019, 8534, 10032
 decimated 1721
 dyadic 1725
 Haar wavelet 8534
 Morlet wavelet 8534
 orthogonal 1721
 overcomplete 1721
 pyramidal 1730
 undecimated 1730
 Wavelet transform modulus maxima (WTMM)
 method 3768, 3894, 3898
 Wavelet transform skeleton 3894
 Wavelets 7, 1165, 1719, 3893, 3923, 5800, 5801,
 6856, 6882, 8669, 10031, 10032
 band-limited 1721
 bi-frames 6897
 biorthogonal wavelets 6856
 box spline tight wavelet frames 5837
 compactly-supported 1721
 Daubechies wavelets 6865
 Haar wavelet 6862
 Meyer 1729
 mother wavelet 10006
 multi-wavelets 6857
 multiresolution analysis 10006
 orthonormal box spline 5835, 5836
 orthonormal wavelets 6863
 pre-wavelets 6868
 q-dilated orthonormal wavelets 6877
 scaling function 10006
 tight wavelet frames 6866
 Way 8280
 Weak approachability 7639
 Weak congestion 9369
 Weak-coupling limit 7809, 7817
 for a single particle 7819
 for classical systems 7809, 7817
 for quantum systems 7814
 Weak (defect-mediated) turbulence 6195
 Weak disorder 6501
 Weak KAM theory 4540, 4542
 Weak L_1 inequality 2936

Weak links 2733
 Weak localization 7921
 Weak-mixing 957
 Weak monotonicity 5516
 Weak observability 6373
 Weak solution 4716, 6218
 viscosity 4546
 Weak spring 5026
 Weak subsolution, definition 4543
 Weak ties 8254, 8263, 8268
 Weak topology, symbolic dynamics 6943
 Weak turbulence 6201
 Weak* topology 431
 Weakly-minimal realization 6375
 Weakly periodic point 9250
 Weakly wandering 5458
 Wealth 2810, 2811, 2823
 Wealth distribution 2810, 2811
 Wealth of nations 8994
 Wealth temperature 2812
 Weather 239, 241
 CCFP 241
 delay minute 241
 forecast 239
 impact 241
 scenario 239
 severe 241
 Weather extremes
 mortality 1097
 Web 2.0 8096, 10069
 Web crawler 10062
 Web graph 1246, 1248, 5266, 5269
 Web link analysis 5267
 Web science 8085
 Web technology 4342
 Weblogs 10067
 livejournal 10067
 Wedge mechanics 1221
 Weibull type 3320
 Weidlich 6384
 Weierstrass 6664
 Weight 6501, 8246
 Weight elasticity 8964
 Weight matrix 8314
 Weighted graphs 4828
 Weighted holistic invariant molecular (WHIM)
 2209

Weighted information
 on graph vertex distances 4831
 on vertex degree distribution 4829
 Weighted Lehmer mean 229
 Weighted mean 229
 Weighted network 2718, 6048, 6057
 Weighted probability 4828
 Weiss B 780, 784–786
 Weiss's microbial colony language 260
 Weizsäcker's equation 4825
 Weka 2124
 Welfare loss 1673
 Welfare policies 7059
 Well log data 7918
 Well-mixed hypothesis 8735
 Well-posedness 6216
 local 2040
 Wellman, Barry 8269, 8270
 Wentzel–Bardeen instability 9687
 West Coast/Alaska tsunami warning center 9596
 Western electric research 8350
 Wetting 2022
 Wetting properties 3638
 Weyl chamber flow 3099
 Weyl pseudometric 2236
 Weyl quantization 6758
 Weyl's criterion 3088
 What if scenarios 7058
 Wheeled calculator 9705
 Wheeler 8843
 Whirlwind 7835
 Whistlers 24
 White noise 3577, 3804, 4595, 6233, 8776
 biological fractals 3794
 White, Harrison 8268, 8273
 Whitesides 5479
 Whitham averaged Lagrangian 10000
 Whitham equation 9998, 10000
 Whitham's averaged variational principle 10000
 Whitham's conservation equations 10000
 Whitham's equation 9999, 10002
 Whitney 704
 Whitney smoothness 5080, 6325
 Whitney umbrella 6632
 Whole 1540
 Whole-arm grasping 1476
 Whole arm manipulation 1225

- Wide moving jam 9356, 9357
 Wide moving jam traffic phase 9303, 9308, 9337
 Widening SP 9364
 Wiedemann's psychophysical traffic flow model 9335
 Wiener index 6838
 a physical meaning of 6848
 high-ordered 6849
 of a hydrocarbon molecule 6838
 of a linear graph 6845
 of graphs with linear branches 6842
 of stars 6843
 Wiener–Khinchine theorem 6142, 6145
 Wiener Lemma 8556
 Wiener process 3438
 stochastic processes 3578
 Wiener theorem, probability 6301
 Wiggins SV model 8787
 Wigner crystals 2027
 Wigner distribution function 7412, 8933
 Wigner equation 7814
 Wigner function 7170
 Wigner surmise 7164, 7506, 7514
 Wigner transform 7814
 Wigner's theorem 6729
 example of 6727
 Wikipedia 10068
 degree distribution 10068
 motif profile 10068
 Wilson 6665
 Window 1724, 1801
 spatial 1724
 Winfree 5478, 5479
 Winner-takes-all 1782, 1821, 3209, 3218, 6106, 9947
 Wireless local area network (WLAN) 3689
 Wiring 5864
 WKB approximation 6749
 connection formula 6751
 semiclassical solutions in the classically allowed region 6749
 semiclassical solutions in the classically forbidden region 6751
 WLC *see* Worm-like chain (WLC)
 Wold representation *see* Vector moving average representation
 Wolfgang Köhler 8939
 Wolfram 8846, 8847
 Wolfram classes 768
 Wolfram's rule 150 3553
 Wolfram's rule 60 3553
 Woodcrest 5758
 Woodgate Beach 3113, 3116, 3130, 3134, 3135
 Word-of-mouth 1959
 Words 1036
 Worker node 156
 Workforce 7835
 World Bank 2816, 2820
 World dynamics 8997
 World meteorological organization 9613
 World Organization of Volcano Observatories 9870
 World Wide Web consortium (W3C) 8085
 World Wide Web (WWW) 8086, 10058
 deep 8089
 of documents 8086
 shallow 8089
 Worldwide standardized seismograph network 2481, 2503
 Worm 4369, 4370
 Worm-like chain (WLC) model 6814, 7033
 Worst-case studies 4051
 WOVOdat 9870
 WOWA operator 230
 Wrapper 1776, 5351
 Wrapping 1729, 5728
 Wright–Fisher model 8771
 Writhe 9271
 Wronskian 3265
 WSQ standard 10006
 WT skeleton 3897, 3898, 3900, 3910
 WTMM method 3904
- X**
- X-Ray 22
 X-Ray sources 392
 XAFS 5890
 Xanthan gum 9808
 XML (extensible markup language) 355, 8085
 RDF/XML syntax 8092
 XML schema 355
 XOR problem 5357

xy-gate, quantum computing 7235
 XY-model 1272

Y

Yanagihara 3553
 Yang–Mills construction, mechanics 5495
 Yang–Mills theories 6666
 Yeast two-hybrid assay 5658
 Yellowstone 2605, 2606
 Yellowstone caldera 9868
 Yield stress 9788
 Yin–Yang computing 4403
 Yomdin’s theory 967
 Yoshida 5472
 Young–Dupré condition 5583
 Young score 9954
 Young winner 9954, 9959
 Young’s dimension formula 3022
 Young’s modulus 691, 698, 699
 Young’s procedure 9954, 9959
 Yukawa potential 8579
 Yunès 3549, 3552, 3553

Z

Z-Gate, quantum computing 7233, 7235
 Z-shaped speed-flow characteristic for traffic breakdown 9295
 Zabusky, N.J. 81
 Zadeh fuzzy rule base 4083
 Zadeh, L.A. 6929
 Zadeh’s extension principle 8682
 Zakharov–Shabat system 4962
 Zareckii lattice 8295
 Zeeman 704
 Zeeman effect 6737

Zeeman’s tolerance stability conjecture 969
 Zeipel’s theorem
n-body 5978
 structure in the collision set 5978
 Zero-blocks 8274
 Zero controllability 4810, 4811
 Zero divisor 779, 788, 790
 Zero dynamics 9085
 Zero knowledge quantum interactive proofs 7191
 Zero-noise limit 963
 Zero-one parameter 9034, 9040, 9043
 Zero padding 10009, 10014
 Zero-photon signal, quantum computing 7230
 Zero-shear-rate viscosity 6849
 Zero-sum game 3190, 4855, 7630, 8381
 Zero-sum two-person game 4096
 Zero temperature 5023
 Zero-tree scheme 10036
 Zeta function 3046, 8897
 Zhreshold effects, critical mass 4617
 Ziff model 888
 Zigzag design 6491
 Zimm matrix 6837
 Zinbiel algebra 1028, 1036
 Zincblende 5764
 Zipf’s-law 6528
 Zipper effect 3149
 Zipper mechanical topology 7039
 Zoë 3690
 Zones 4182
 boundary 4182
 of proximal development 1877, 1880, 1881, 1885
 Zuse 8844
 Zygote 526