

**Memorandum of Understanding**  
**Between**  
**University Corporation for Atmospheric Research**  
**and**  
**National Institute for Space Research**  
**on**  
**Global Navigation Satellite System Receiver Collaboration**

This Memorandum of Understanding (MOU), effective as of July 1, 2016 ("Effective Date"), is entered into by and between the University Corporation for Atmospheric Research (UCAR) acting on behalf of the COSMIC Program Office (Constellation Observing System for Meteorology, Ionosphere and Climate) (UCAR/COSMIC), having a mailing address of 3090 Center Green Drive, Boulder, Colorado 80307, USA and National Institute for Space Research (INPE), from the Ministry of Science, Technology, Innovation and Communication, having a mailing address of Av. dos Astronautas, 1758 – Jardim da Granja, São José dos Campos, SP, Brazil. UCAR and INPE may be alternately referred to herein as party, individually, or parties, collectively.

**Article 1 - Purpose/Objective:**

This MOU between UCAR and INPE provides a framework for collaboration on a Global Navigation Satellite System (GNSS) receiver station supporting the COSMIC-2 mission and space geodesy research.

## Article 2 - Activities:

Subject to the availability of funds and personnel at each organization, and the mutual agreement of both parties, activities related to a GNSS receiver system will be undertaken by UCAR/COSMIC and INPE using reasonable efforts as follows:

- A. INPE will host a GNSS receiver system provided by UCAR/COSMIC. The equipment will collect and transmit GNSS tracking data to UCAR/COSMIC in real-time via the Internet to support science processing for the COSMIC-2 mission and research in space geodesy.
- B. INPE will provide a secure operating location, power, a static IP address, and Internet connectivity for data transmission.
- C. UCAR/COSMIC will provide equipment for a GNSS receiver system. This system includes a geodetic GNSS receiver, geodetic choke-ring antenna, computer, battery backup, cables, and related accessories ("System"). UCAR/COSMIC will be responsible for transporting the System to/from INPE and any necessary customs fees.
- D. UCAR/COSMIC and INPE will support System installation and testing as well as operational maintenance.
- E. System configuration will be controlled by UCAR/COSMIC in consultation with INPE. If operational concerns arise (e.g. networking issues) they will be settled by mutual agreement.
- F. The GNSS tracking data shall be available to both parties for non-commercial use. Sharing data with external parties not included in this MOU shall be at the discretion of UCAR/COSMIC.

### **Article 3 - Schedule of Expenses:**

Subject to Article 2, costs and work related to this MOU shall be distributed as follows:

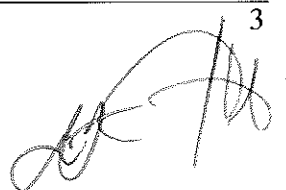
<b>Cost Item</b>	<b>Responsible Party</b>
GNSS receiver system, including geodetic GNSS receiver, geodetic choke-ring antenna, fanless computer, battery backup, cables, and accessories	UCAR/COSMIC
Transportation of GNSS receiver system to/from Brazil and custom fees	UCAR/COSMIC
Provision of secure operating location, power, static IP address, and Internet connectivity	INPE
GNSS receiver system installation support and testing	UCAR/COSMIC and INPE
Minor maintenance of the System equipment once operational	INPE
System updates (e.g. firmware) and replacement of failed hardware	UCAR/COSMIC

Should additional expenses arise their settlement will be arranged by mutual agreement. Should there be an exchange of funds between the two organizations, the transfer and use of such funds shall be defined in an agreement separate from this MOU.

### **Article 4 - Term of MOU, Extensions, and Amendments:**

The Term of this MOU shall be for a period of five (5) years from the Effective Date, unless earlier terminated under the termination provisions of Article 10 ("Term"). Upon termination of this MOU, the GNSS receiver system shall be returned to UCAR/COSMIC. If the parties mutually agree that it would be to the benefit of the parties to extend the Term of this MOU, the

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parties shall execute an amendment, which extends the Term under the same terms and conditions as recited herein. Both parties may mutually agree to amend the terms of this MOU. No amendment or modification of this MOU shall be valid unless made in writing and signed by duly authorized representatives of UCAR and INPE. UCAR and INPE further acknowledge that facsimile signatures are fully binding and constitute a legal method of executing this MOU.

#### **Article 5 - Laws/Regulations:**

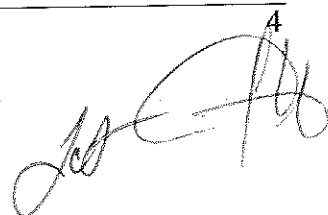
This MOU and the respective performance of the parties hereunder shall be subject to all applicable export control laws and regulations of the United States of America and Brazil.

#### **Article 6 - Responsibility of Each Party:**

Subject to the availability of funds and personnel, both parties agree to use reasonable efforts to support the activities outlined in Article 2, and each party shall be responsible for providing facilities and other mutually agreed upon support.

#### **Article 7 - Technical and Contractual Points of Contact:**

<b>COSMIC Program Office Technical Representative:</b>	<b>UCAR Duly Authorized Representative:</b>
Dr. Jan Weiss Manager, COSMIC Data Analysis and Archive Center Phone: +1 303 497 2605 E-mail: weissj@ucar.edu	Ms. Virginia L. Taberski Contracts Director Phone: +1 303 497 2132 E-mail: taberski@ucar.edu
<b>INPE Technical Representative:</b>	<b>INPE Duly Authorized Representative:</b>
Dr. Oswaldo Duarte Miranda General Coordinator of the Space and Atmospherics Science Phone: +55 12 3208 7191 E-mail: oswaldo.miranda@inpe.br	Dr. Leonel Fernando Perondi INPE's Director Phone: +55 12 3208 6034 E-mail: diretor@inpe.br



**Article 8 - Publication Rights:**

Both parties acknowledge that each party may publish technical and scientific papers, present results at conferences and workshops, participate in symposia, give seminars, or the like regarding the subject matter of this MOU. When either party prepares a publication related to the subject matter of this MOU, the inclusion of co-authors from both parties is encouraged as appropriate. Each party shall be permitted thirty (30) days to review any papers related to the subject matter of this MOU prior to submission for publication to remove any proprietary and/or confidential information or inappropriate references.

**Article 9 - Other Agreements:**

In the event any additional understandings such as, but not limited to, those related to the licensing of technology for research or commercialization purposes, or the need to enter into a separate agreement for the transfer of funds, the parties shall in good faith enter into negotiations to reduce to a mutually agreeable writing the obligations and terms associated with such understandings.

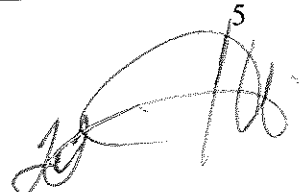
**Article 10 - Termination:**

Either UCAR or INPE may terminate this MOU at any time during the term stated herein without cause provided the terminating party gives the terminated party 30-days written notice.

**Article 11 - Force Majeure:**

The term "force majeure" means war, civil disturbances, natural disasters, strikes, and other similar events including long-term power and Internet connection failure not caused by or within the control of either party.

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If either party fails to accomplish tasks specified in this agreement because of "force majeure", related work in this period shall be suspended. In this case both parties shall bear their own losses and communicate with each other to minimize the extent of losses.

## Parties

In WITNESS WHEREOF, the parties hereto have agreed to the terms and conditions recited in this MOU as evidenced below by the signatures of each party's duly authorized representative.

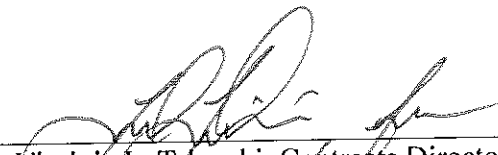
**COSMIC Program Office**  
**University Corporation for Atmospheric**  
**Research**



William Schreiner, Director

Date *July 22, 2016*

**University Cooperation for Atmospheric**  
**Research**

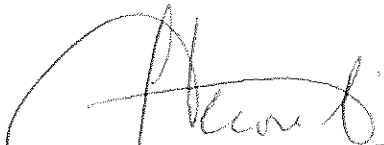


Virginia L. Taberski, Contracts Director

Date

*August 15, 2016*

**National Institute for Space Research**



Leonel Fernando Perondi, Director

Date *June 24, 2016*