

A.31 UTILIZATION OF AIRBORNE VISIBLE/INFRARED IMAGING SPECTROMETER – NEXT GENERATION DATA FROM AN AIRBORNE CAMPAIGN IN INDIA

**NOTICE: November 16, 2016. This program element has reopened. NASA requests revised or new Notices of Intent to be resubmitted by December 8, 2016. The new due date for proposals is January 17, 2017. New text is in bold, deleted text is struck through.**

**April 11, 2016: The site list under "Other Documents" has been updated to include acquisition dates and a point of contact to discuss potential collaborations with counterparts in India and also to gain access to potential Indian ground data.**

**March 23, 2016: The list of sites in India for which imagery has been acquired has been posted under "Other Documents" on the [NSPIRES web page of this program element](#). The due dates are unchanged. New text is in bold, deleted text is struck through.**

1. Scope of Program

NASA and the Indian Space Research Organisation (ISRO) have a mutual interest in using imaging spectroscopy for improved detection and understanding of Earth surface features. As part of a broader cooperative effort in Earth science research and applications, these agencies operated the NASA Airborne Visible/Infrared Imaging Spectrometer – Next Generation (AVIRIS – NG) instrument aboard the ISRO National Remote Sensing Centre King Air B-200 aircraft in the December 2015, to February 2016 time period. AVIRIS-NG is a NASA airborne imaging spectrometer in which each ground pixel measures the complete surface-reflected solar spectrum over the 380 to 2500nm spectral range. This airborne campaign ~~will~~ generated data products relevant to Earth science research and applications activities in a number of topic areas by capturing spectra from terrestrial, freshwater, and marine sites throughout India. The products will provide ISRO with important baseline spectroscopy data for a wide variety of Indian environments and offer NASA researchers an opportunity to use an important new dataset. Both NASA and ISRO ~~will~~ have access to all scientific data coming from the AVIRIS-NG instrument. This campaign marked the first step in a potential multiyear effort between NASA and ISRO to advance imaging spectroscopy of the Earth. The sites selected are expected to support research into the following topics:

- Agriculture and soils
- Wetland ecosystems
- Mangrove ecosystems
- Forest ecosystems
- Coral reef ecosystems
- Mineral exploration
- Snow and glaciers
- Urban studies
- Biological oceanography
- Coastal land use/land cover

- River water resources and water quality
- Clouds, atmosphere, and air pollution
- Calibration studies

Lists of selected sites are in the ISRO-NASA AVIRIS-NG Airborne Flights Over India Science Plan Document: Hyperspectral Remote Sensing. A link to download this document as a PDF file will appear under "other documents" on the NSPIRES web page of this program element. Proposers should focus on the priority 1 sites listed in this document, as priority 2 sites may not be acquired due to the limited flight hours available. ~~After the acquisition of the AVIRIS-NG imagery, this solicitation appendix will be amended to incorporate~~ The list of sites in India for which imagery has been acquired **has been posted under "Other Documents" on the [NSPIRES web page of this program element](#)**. [Corrected March 23, 2016]

Plans are for ISRO to operate the aircraft at an altitude of approximately 7km to generate products of approximately 7m ground spatial sampling. NASA will make Level 1 (at sensor radiance) and Level 2 (surface reflectance) data products available under this solicitation through the AVIRIS-NG website at <http://avirisng.jpl.nasa.gov>. Data will become available approximately three months after the completion of the flight campaign, so proposals should be written in such a way that the effort proposed fully benefits from the newly acquired data. Expected data volumes range from 50 gigabytes to 250 gigabytes per site.

**Quicklooks for the AVIRIS-NG data are available at <https://avirisng.jpl.nasa.gov/quicklooks.html> and by then clicking on the links to "2015 Flights" and "2016 Flights."** The site list for the 57 Indian sites is still available through the NSPIRES cover page for this solicitation under "Other Documents" as is the Science Plan for these flights.

**Investigators wanting to pursue opportunities for potential collaborations with Indian investigators are encouraged to send their notices of intent to Dr. Bimal K. Bhattacharya, SAC, ISRO, Ahmedabad, India at the contact information below by December 7, 2016.**

**Dr. Bimal K Bhattacharya**  
**Head, Agriculture and Land Eco-system Division (AED), BPSG/EPISA**  
**Science Team Leader (AVIRIS-NG Airborne campaign)**  
**Space Applications Centre**  
**Indian Space Research Organisation**  
**Ahmedabad 380015, Gujarat, India**  
**E-Mail: [bkbhattacharya@sac.isro.gov.in](mailto:bkbhattacharya@sac.isro.gov.in)**. [Added November 16, 2016]

## 2. Description of Solicited Research

This solicitation seeks proposals for data analysis and modeling of AVIRIS-NG airborne data from this campaign that are relevant to programs in the six NASA Earth Science Research and Analysis (R&A) Focus Areas: Carbon Cycle and Ecosystems, Earth Surface and Interior, Water and Energy Cycle, Climate Variability and Change, Weather, and Atmospheric Composition (<http://science.nasa.gov/earth-science/focus-areas/>). Proposals relevant to applications research

in support of the NASA Applied Sciences Program (<http://appliedsciences.nasa.gov>) are also welcome.

Only proposals making primary use of data products from the AVIRIS-NG Indian campaign will be responsive to this solicitation. In addition to the AVIRIS-NG data products, use of data from surface-based networks associated with the airborne campaign sites is welcome. Utilization of relevant data from other sources, including data from NASA satellites or those of NASA's interagency and international partners, is encouraged. Proposals may not include costs for acquisition of any additional or complementary airborne data.

Details of the airborne campaign may be found in the ISRO-NASA AVIRIS-NG Airborne Flights Over India Science Plan Document: Hyperspectral Remote Sensing, which may be downloaded as a PDF file at the NSPIRES web page of this program element under "other documents."

### 3. Programmatic Information

Proposals should request one-time funding for use over an eighteen (18) month period to cover the costs of personnel, computing, publication, and travel associated with the data analysis and modeling activities. No follow-on to this solicitation is planned, so proposers should expect no opportunities for continuation awards, except as may become available through future solicitations of ongoing R&A programs.

### 4. Summary of Key Information

Expected one-time program budget for new awards.	\$1.35 M
Number of new awards pending adequate proposals of merit	~ 10 to 15
Maximum duration of awards	18 months
Due date for Notice of Intent to propose (NOI)	See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i>
Due date for proposals	See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i>
Planning date for start of investigations	Six months after proposal due date
Page limit for the central Science/Technical/Management section of proposal	15 pp for all proposals; see also Chapter 2 of the <i>NASA Guidebook for Proposers</i>
Relevance to NASA	This program is relevant to the Earth Science questions and goals in the NASA Science Plan. Proposals that are relevant to this program are, by definition, relevant to NASA.
General information and overview of this solicitation	See the <i>ROSES Summary of Solicitation</i> .

Detailed instructions for the preparation and submission of proposals	See the <i>NASA Guidebook for Proposers</i> at <a href="http://www.hq.nasa.gov/office/procurement/nraguidebook/">http://www.hq.nasa.gov/office/procurement/nraguidebook/</a> .
Submission medium	Electronic proposal submission is required; no hard copy is required or permitted. See Section IV of the <i>ROSES Summary of Solicitation</i> and Chapter 3 of the <i>NASA Guidebook for Proposers</i> .
Web site for submission of proposal via NSPIRES	<a href="http://nspires.nasaprs.com/">http://nspires.nasaprs.com/</a> (help desk available at <a href="mailto:nspires-help@nasaprs.com">nspires-help@nasaprs.com</a> or (202) 479-9376)
Web site for submission of proposal via Grants.gov	<a href="http://grants.gov">http://grants.gov</a> (help desk available at <a href="mailto:support@grants.gov">support@grants.gov</a> or (800) 518-4726)
Funding opportunity number for downloading an application package from Grants.gov	NNH16ZDA001N-AVRSNG
NASA point of contact concerning this program:	Woody Turner Earth Science Division Science Mission Directorate National Aeronautics and Space Administration Washington, DC 20546-0001 Telephone: (202) 358-1662 E-mail: <a href="mailto:woody.turner@nasa.gov">woody.turner@nasa.gov</a>