

SMD/Planetary Science Division

SUBJECT: Planetary Science Facilities Program.

Background:

With the goal of assessing and maximizing the scientific productivity of its Facilities and Laboratories Program, the NASA's Planetary Science Division (PSD) initiated a review of its existing funded facilities, organized a special session at the upcoming Lunar and Planetary Science Conference in Houston, Texas, and solicited comments from the planetary science community through an RFI and a survey coordinated by the Planetary Science Subcommittee. This was done with the ultimate goal of answering the needs of the community with the release of a Cooperative Agreement announcement in calendar year 2016, for an updated and possibly expanded Facilities program. It is the intent of this announcement to appraise the community of the results of these endeavors and project future actions regarding a PSD Facilities Program.

Review of Existing PSD Facilities:

In its review of existing facilities, PSD was focused on assessing how the currently funded facilities are working, how they serve the science needs of the broader planetary community, identifying the impact and productivity of each funded facility, and determine best practices and lessons learned for further development of a Facilities Program.

LPSC Facilities Session:

The LPSC special session solicited abstracts from any person or group who feel that they have a facility that has a substantial user base outside the in-house users and clearly advances the broader field. The organizers did not want to overprescribe who should or should not submit an abstract but relied on members of the community to use their judgment as to whether their facility fits these criteria. Through this, PSD sought to help the present facilities as well as ones not currently funded by PSD gain more visibility within the community but specifically with members who may not know about them or their capabilities. PSD also used this special session as part of the definition of potential future additions to a Facilities Program.

Request for Information:

The RFI solicited community feedback on any or all of the following questions:

1. Do you use any existing planetary science facility that serves the broader community? If so, please describe to what extent. How did you find out about it? Please, briefly describe your experiences in using that facility.

2. In your opinion, what capabilities are missing or unavailable in the implementation of your research activities that could be supported through the Facilities Program? Are you aware of existing facilities that could meet your needs if they were made available to the community?

3. Do you currently manage, or plan to develop, a facility that could serve the broader community? Describe the facility and what needs it would fill.

PSS Survey:

Additionally, PSD acknowledged that Laboratory instruments and facilities led by individual PIs are critical for analyzing extraterrestrial materials, terrestrial materials that inform planetary exploration and data analysis, constraining the interpretations of planetary remote sensing data, and developing future flight instrumentation.

NASA has supported laboratories and major instrumentation for many years. It is becoming increasingly difficult to maintain technical staff support, placing stress on the community's research and training needs.

The PSS obtained community input, through the Advisory Groups and other avenues as appropriate (e.g., Astrobiology Institute), about the number and type of PI laboratories that undertake research, supporting PSD objectives, and their technical staff support models. This information is needed to understand the planetary community's laboratory capabilities and challenges, and to define the magnitude of the stress on research and training needs. The requested information will be used to inform discussions with PSD about the challenge and to help formulate potential solutions.

National Academies of Science Charge:

Through those efforts it became apparent that the international community also has an immense structure of resources that could be leveraged more strategically to the benefits of the community.

With the goal of maximizing the scientific productivity of its community and avoiding redundancy of its resources the Planetary Science division has charged the National Academies to hold a review assessing the availability and usage of existing laboratories on a national and international level.

In order to be adequately prepared for the upcoming decade of advanced analysis of new extraterrestrial samples, information is needed to understand the current and future planetary community's laboratory capabilities, requirements, and challenges. Therefore, NASA requested that the National Academies perform a study addressing the following questions:

- ❖ What laboratory analytical capabilities are required to support PSD (and partner) analysis and curation of existing and future extraterrestrial samples?
 - Which of these capabilities currently exist, and where are they located (including international partner facilities)?
 - What existing capabilities are not currently accessible that are/will be needed?

- ❖ Whether the current sample laboratory support infrastructure and NASA's investment strategy meets the analytical requirements in support of current and future decadal planetary missions.
- ❖ How can NASA ensure that the science community can stay abreast of evolving techniques and be at the forefront of sample analysis?

In order for NASA to be able to use the results of the Planetary Science review in formulating its programs and requirements, NASA requested to receive the Academies' findings no later than first quarter of 2018.

Future Plans and the Facilities Program CAN:

The reports from the PSD Facilities Review, the documents for the LPSC session, and the results of the RFI and PSS survey can be found on the PSD Facilities website at <http://www.lpi.usra.edu/psd-facilities/>.

In order for the Facilities' Program to better respond to the needs of the community, the 2016 Facilities Cooperative Agreement announcement will be delayed until we receive the National Academies report regarding laboratory analytical capabilities and the current sample laboratory support infrastructure. This will help PSD determine the best strategy in supporting the planetary community's need for facilities as well as Sample Return Laboratories. In the meanwhile, current PSD funded facilities: the NASA Ames Planetary Aeolian Laboratory (PAL), the NASA Ames Vertical Gun Range (AVGR), the Reflectance Experiment Laboratory (RELab), and the NASA Glenn Extreme Environments Rig (GEER) have been all awarded extended mission funding until the next review.