National Aeronautics and Space Administration

Headquarters
Washington, DC 20546-0001

Reply to Attn of: SMD/Planetary Science Division

SEP 23 2016

Dr. David Spergel
Chair, Space Studies Board
National Research Council
500 5th Street NW
Washington, DC 20001

Dear Dr. Spergel,

NASA has a long history of supporting new and innovative capabilities in the analysis of meteorites and with returned samples from space. The Planetary Science Division (PSD) has always acknowledged that laboratory instruments and facilities are critical for analyzing extraterrestrial materials in support of planetary exploration and data analysis, constraining the interpretations of planetary remote sensing data, and developing future flight instrumentation. With this in mind, PSD has developed a dedicated Astromaterials Curation Facility at the Johnson Space Center and the Analytical facilities at other NASA centers and within the planetary science community. Over the years, the planetary science community has taken advantage of a number of opportunities to support sample analysis work, such as:

- Research and Analysis (R&A) grant awards to individual principal investigators (PI), especially in the Emerging Worlds, Solar System Workings, Exobiology, and Laboratory Analysis of Returned Samples (LARS) programs, but also in a number of previous programs;
- Instrument development for NASA sample-return missions, supported by R&A funds;
- The Planetary Major Equipment program, which supports the purchase of off-the-shelf instruments;
- Grant awards in current and future participating science/guest investigator programs (e.g., Hayabusa2-PSP, future OSIRIS-REx GIP).

In the coming decade, NASA (and our international partners) will develop and operate an increasing number of sample return missions (*e.g.,* Hayabusa-2, OSIRIS-REx, Mars Sample Return, Martian Moons Exploration mission). In the meantime, tremendous advances are occurring in laboratory instruments capability and precision.

In order to adequately be 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 requests that the National Academy of Sciences (NAS) 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 to be at the forefront of extraterrestrial sample analysis.

In order for NASA to be able to use the results of this review in formulating its programs and requirements, NASA must receive the Academy's findings no later than first quarter of 2018.

I request that the NAS submit a plan for execution of the proposed performance review by the Space Studies Board. Once agreement on the scope, cost, and schedule of the proposed study has been achieved, the contracting officer will issue a task order for implementation. The point of contact within the Science Mission Directorate will be Dr. James Green, at (202)-358-1588 or james.green@nasa.gov.

Sincerely,

Geoffrey L. Yoder
Acting Associate Administrator for
Science Mission Directorate