National Aeronautics and Space Administration

NASA

Findings & Recommendations on SMD ROSES Gaps RFI

EXPLORE SCIENCE

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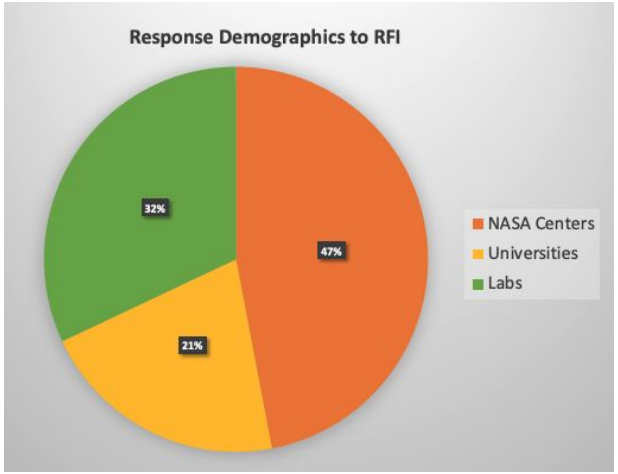
Program Scientists in all the divisions and SMD leadership

Introduction

- SMD released a Request for Information (RFI) to identify gaps in opportunities for interdisciplinary and interdivisional research
  - NASA Science research programs have traditionally operated within the Division structure
  - Community and NASA recognize the potential for research that is at the interface of traditional disciplines
- RFI specifically requested input on research that is responsive to the goals of two or more Divisions but was not addressed by existing research programs.
- Released on December 2, 2019. Responses closed on January 31, 2020.
  - 97 responses submitted

Demographics of Respondents

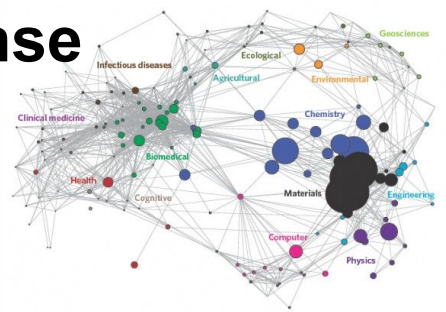
- Number of responses: 97 complete
- Demographics of responders:
  - NASA Centers (incl. JPL): 47%
  - Academia : 21%
  - Labs (e.g., UARCS, FFRDCs): 32%
- MSIs (HBCUs/HSIs): 1 out of 97



Overview of Responses to the RFI

- Responses covered the breadth of SMD-supported disciplines; addressed science, technology, and other capabilities.
- Responses fell into one of five major themes:
  - Gaps in existing SMD research programs
  - Technology development
  - Data science, algorithms, software
  - Ground-based observations
  - Data archives
- For each theme, relations to current, planned, and potential SMD activities were identified.
  - Significant number of raised points have been recognized by SMD over the past few years, internal actions have been underway
  - No decisions have been made out of RFI yet, current public health situation has stressed bandwidth and research programs

Findings & SMD Actions in Response

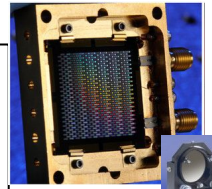


F1. Some research projects are specific short term projects (e.g. airborne research over the Antarctic, Bridging the gap in terrestrial impact craters) which are often **second or third priority for divisions. Others** (e.g. sprites, stratosphere-mesosphere coupling) **fall between discipline stovepipes** and may need interagency partnerships.

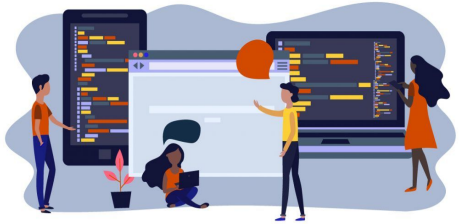
ACTION (NEW): We will add a checkbox on the proposal cover page (and space for an explanatory paragraph) allowing proposers to indicate that their research is interdivisional. Program Officers will use the information to ensure an appropriate review for these proposals. SMD will analyze the data over two ROSES cycles (ROSES 21 and 22), report back to the community on these interdivisional proposals, and adjust strategy accordingly.

Findings & SMD Actions in Response

F2. Technology development <u>across</u> multiple disciplines could be better coordinated (e.g., mirror technology, sensors/ detectors; tightly coupled platforms & instruments, system-level technologies).



ACTION (NEW): SMD Chief Technologist to hold a Technology Festival in early 2021 to foster better awareness of the investments and opportunities for cross-divisional technologies in SMD and STMD, and to foster better coordination and exchange of ideas across the community.

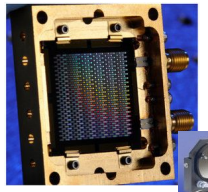


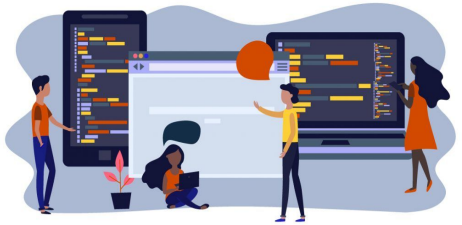
ACTION (IN PROGRESS): By 2nd quarter 2021, the TechFed will publish its Directorate-wide gaps list that is now being crafted, with the 2015 Technology Roadmaps as a starting point, in synergy with science requirements.

Findings & SMD Actions in Response

F2. Technology development <u>across</u> multiple disciplines could be better coordinated (e.g., mirror technology, sensors/ detectors; tightly coupled platforms & instruments, system-level technologies).

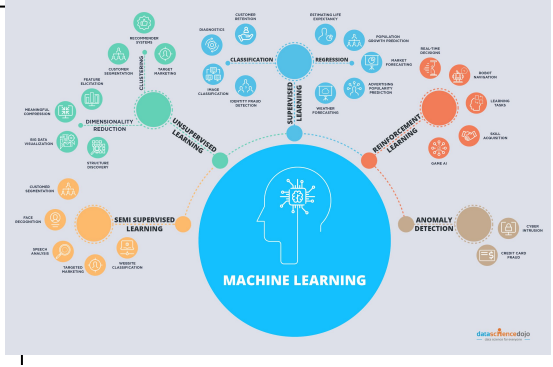
ACTION (NEW): The TechFed concurs that low TRL (1--3) core / enabling technologies (e.g. photonics, HEC, small satellite platform tech, autonomy, etc.) could be developed and managed in a cross-cutting fashion (e.g. STMD's Early Stage Innovation Program). TechFed is undertaking a study on the balance in the portfolio between early and late stage TRL technologies and how they are funded. It will report its findings and recommend adjustments. Expect report by 1st qtr 2022.





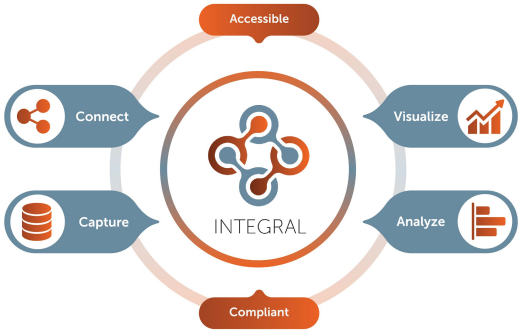
Findings & SMD Actions in Response

F3. Data science techniques and algorithms could be better shared and coordinated across the directorate for more efficient missions + data mining.



ACTION (IN PROGRESS): SMD has established a Science Data Management Working Group (SDMWG) and appointed a new Science Data Officer. This group is investigating how to create appropriate mechanisms for capturing and serving data science techniques + algorithms that could be useful across SMD missions.

ACTION (IN PROGRESS): SDMWG is laying out a SMD-wide policy to require all proposals to archive and make publicly available all software generated by SMD funded research. Expect an announcement by 1st qtr 2021.

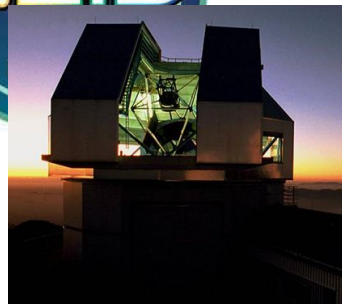


Findings & SMD Actions in Response

F4. Community desire for NASA to make larger investments in ground-based items (telescopes, sensors/instruments, lab).

ACTION (IN PROGRESS): SMD will clarify existing flexibilities in AOs to proposers, reviewers and program scientists. AOs allow for costs of mission-essential ground-based work (e.g. TESS follow-up, THEMIS, GENESIS). To be reported at town halls and advisory committees, as well as improved language in AOs.

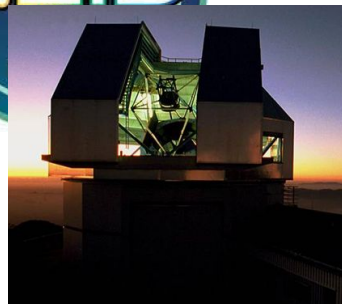
ACTION (IN PROGRESS): SMD will clarify existing opportunities and flexibilities in R&A as well as the role of other agencies with community. To be reported at town halls and advisory committees, as well as improved language in ROSES 21.



Findings & SMD Actions in Response

F4. Community desire for NASA to make larger investments in ground-based items (telescopes, sensors/instruments, lab).

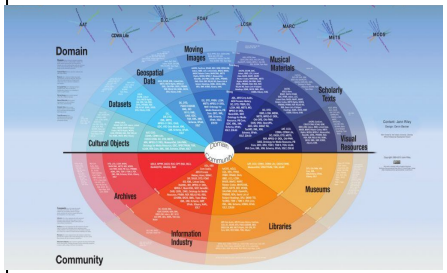
ACTION (NEW): SDMWG to consider best ways to link relevant databases resulting from laboratory research that may be useful across divisions (e.g. spectroscopy of ices, atomic coefficients, etc.). Expect progress report by 1st qtr 2022.



Findings & SMD Actions in Response

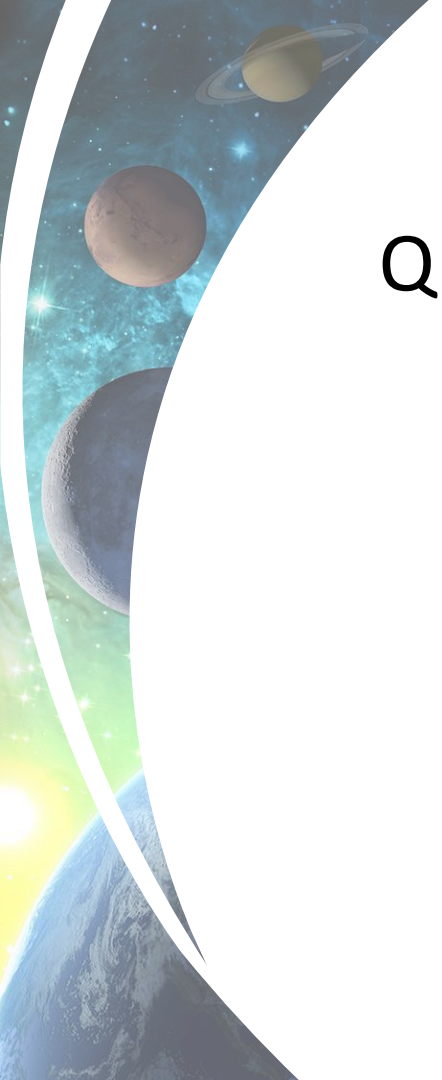
F5. Community wants NASA to review and build more holistic archives with appropriate policies for initiating, maintaining and sunsetting archives.

ACTION (IN PROGRESS): SDMWG is developing data policies to address all SMD data including archives. SMD to adopt and announce policies to community by 1st qtr 2021.



ACTION (IN PROGRESS): SDMWG working on developing a common metadata standard and sharing of archival data between divisions to maximize science. Expect work on initial standards to be completed in 2021 and rolled out to community in subsequent years.

ACTION (IN PROGRESS): SMD is establishing a data catalog to make all data discoverable. 2-3 year timescale for wide-implementation. Prototypes by 1st qtr 2022.



QUESTIONS?