



Small Innovative Missions For Planetary Exploration (SIMPLEx)

Pre-Proposal Conference
May 22, 2018

- 1:00 – 1:20 SIMPLEx Overview (PS,PE)
- 1:20 – 1:50 Technical Management Cost Review (SOMA)
- 1:50 – 2:20 Planetary Mission Program Office (PMPO)
- 2:20 – 2:40 Launch Services (LSP)
- 2:40 – 3:00 Planetary Protection (PPO)
- 3:00 – 3:20 Non-U.S. collaborations (OIIR)
- 3:20 – 3:40 Export Control (Legal)
- 3:40 – 4:00 More Q&A

<https://soma.larc.nasa.gov/simplex/prepropconf.html>

The webex information is:

<https://nasa.webex.com/nasa/j.php?MTID=mc239099c50bb2c7e87415d23d03da96a>

Meeting number: **996 358 354**

Meeting password: **SIMPLEx0522!**

The dial in number is **1-844-467-4685** and the passcode **869324**



Small Innovative Missions For Planetary Exploration (SIMPLEx)

Doris Daou, Program Scientist
Carolyn Mercer, Program Executive

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SMD CubeSat/SmallSat Approach

National Academies Report (2016) concluded that CubeSats have proven their ability to produce high-value science:

- Useful as targeted investigations to augment the capabilities of larger missions
- Useful to make highly-specific measurements
- Constellations of 10-100 CubeSat/SmallSat spacecraft have the potential to enable transformational science

SMD is developing a directorate-wide approach to:

- Identify high-priority science objectives in each discipline that can be addressed with CubeSats/SmallSats
- Manage program with appropriate cost and risk
- Establish a multi-discipline approach and collaboration that helps science teams learn from experiences and grow capability, while avoiding unnecessary duplication
- Leverage and partner with a growing commercial sector to collaboratively drive instrument and sensor innovation





Small Innovative Missions For Planetary Exploration (SIMPLEx)

- Small Innovative Missions for Planetary Exploration (SIMPLEx) is a program element appendix (PEA “J”) in the Third Stand Alone Missions of Opportunity Notice (SALMON-3) [NNH17ZDA004O](#)
- The SIMPLEx [Program Library](#) includes a link to the solicitation, a summary of major changes from the draft, and a Frequently Asked Questions document.
- SMD’s objectives for SIMPLEx are to:
 - Develop and operate targeted science investigations requiring space flight that exploit the unique attributes of small satellites to conduct compelling science,
 - Take advantage of available launch capacity to reduce the overall costs of launching multiple missions,
 - Provide a means to mature technologies for future missions, and
 - Provide additional opportunities to provide flight experience to the community.
- This PEA solicits investigations responsive to the goals of the NASA’s Planetary Science Division (PSD) as described in the 2018 NASA Strategic Plan and the 2014 NASA Science Plan.



Small Innovative Missions For Planetary Exploration (SIMPLEx) Science Goals

- NASA's strategic objective in planetary science is to "ascertain the content, origin, and evolution of the Solar System, and the potential for life elsewhere." NASA pursues this strategic goal by seeking answers to fundamental science questions that guide NASA's solar system exploration:
 - How did our solar system form and evolve?
 - Is there life beyond Earth?
 - What are the hazards to life on Earth?
- These questions have been translated into science goals that guide the focus of the Planetary Science Division's science and research activities. These goals are:
 - Explore and observe the objects in the solar system to understand how they formed and evolve;
 - Advance the understanding of how the chemical and physical processes in our solar system operate, interact, and evolve;
 - Explore and find locations where life could have existed or could exist today;
 - Improve our understanding of the origin and evolution of life on Earth to guide our search for life elsewhere; and
 - Identify and characterize objects in the solar system that pose threats to Earth, or offer resources for human exploration.

Proposed investigations may target any solid body in the Solar System except for the Earth and Sun. Investigations of extrasolar planets are not solicited in this PEA.



Small Innovative Missions For Planetary Exploration (SIMPLEx) Spacecraft Type and Launch Opportunities

- SIMPLEx is soliciting small complete science missions based on small spacecraft (SmallSats) flying as secondary payloads
 - ESPA-class (180 kg) or smaller
 - Allowable configurations include CubeSats up to 12U, and ESPA-class
 - ESPA-Grande sized spacecraft allowed for some opportunities (still limited to 180 kg)
 - Total mission cost capped at \$15M - \$55M
 - NASA expects awards to span the full range cost cap range
- Proposed missions are limited to the launch opportunities listed in Appendix A of the PEA. Currently listed are:
 - SMD missions (Lucy, Psyche, and IMAP),
 - Commercial Lunar opportunities,
 - LEO/GTO opportunities, and
 - Exploration Mission “x” (EM-2 or beyond)



Small Innovative Missions For Planetary Exploration (SIMPLEx) Nominal Schedule

- Launch minus four years (L-4): Cut-off consideration for a specific mission
 - Select and award Phase A/B design studies; expected product is PDR-level design
 - Launch Vehicle is unknown
- L-3 years: Down-select secondary mission(s) for specific primary mission
 - May be possible to select multiple secondaries for a given primary mission
 - Selections coordinated with launch vehicle selection
 - Provided for Phase C design/build:
 - More detailed launch vehicle trajectory, environments and interfaces
- L-2 years: Build/test secondary payload
- L-1 years: Build/test/integrate secondary payload
- L-3 months: Integrate secondary payload into the launch vehicle (nominal date)
- L: launch



Small Innovative Missions For Planetary Exploration (SIMPLEx) Selection Schedule

- July 24, 2018
 - Proposal due date for first round of evaluation/selections
 - Final Proposal due date for Lucy and Psyche
- Proposal due date for second round of evaluations/selections will be announced well in advance of that deadline. This due date is likely to be no earlier than July, 2019.
- August – September, 2018
 - Science Review Panels
- October, 2018 – January, 2019
 - Technical Management Cost Review Panels
 - Only a subset of the proposals, based on their science review scores
- ~February, 2019 – Selection Announcements
- ~May – ~August, 2019 – Contract Awards
 - Contract award time based on dollar value of contract



Small Innovative Missions For Planetary Exploration (SIMPLEx) Selections

- 2 – 3 Awards expected for Phase A/B
- Each Phase A/B award will be funded for up to one year
 - Preliminary Design Reviews conducted by the Planetary Missions Program Office (PMPO)
 - Long lead time procurements not allowed during this phase
- Selection(s) will be based on technical and science merit and programmatic factors as described in the PEA.
- The Selection Official may take into account a wide range of programmatic factors, including, but not limited to,
 - planning and policy considerations, available funding,
 - programmatic merit and risk of any proposed partnerships,
 - maintaining a programmatic balance across the mission directorate(s),
 - likelihood that the proposed SmallSat can be accommodated on the primary mission.

The decision to fly an investigation from this solicitation will balance the "accommodatability" of the proposed SmallSat onto the launch vehicle with the value of the science to be returned from the selected investigation.

Accommodation considerations include but are not limited to the ability to select multiple CubeSats or the amount of additional boost that may be required by the launch vehicle as a result of the selected secondary mission.



Small Innovative Missions For Planetary Exploration (SIMPLEx) Options

- Science Enhancement Options (SEOs) are allowed
- Technology Infusion Opportunities are allowed
- Student Collaborations are allowed
- Technology Demonstration Opportunities are not encouraged
- No independent Education or Communications and Outreach program

- International participation is allowed
 - The sum of non-U.S. contributions of any kind to the entirety of the investigation is not to exceed one-half (1/2) of the proposed Total Mission Cost.
 - Only U.S. organizations are eligible to propose as the sole or lead organization.

- Contributions from sources other than NASA, whether U.S. or non-U.S., are accepted.

- Access to space provided by NASA



Small Innovative Missions For Planetary Exploration (SIMPLEx) Technology

It is expected that new technologies may be required to accomplish planetary science missions proposed under this PEA. Proposals must justify how the proposed technology will contribute to mission success.

For technologies and subsystems that **do not have flight heritage**, the proposal must include a reference to the details and the results of testing and/or analysis that demonstrate performance in a **relevant environment under conditions that simulate all known significant failure modes** of the technology to demonstrate technical maturity of TRL 6. If a combination of this testing and analysis is proposed to be accomplished in Phase A/B, then a reference must be included describing what testing/analysis is planned or has been completed at the time of proposal submission to demonstrate a plan for maturing these systems to TRL 6 by PDR. A summary of the test/analysis should be included in the body of the proposal. Proposals must include a limited life item list and for those items show plans for how they can **meet 1.5 times the worst-case expected operating life of the proposed mission**.

For technologies and subsystems that **do have flight heritage**, claims of heritage must be supported by a description of the **similarities in design and flight environments between the heritage and the proposed mission**.