2019 Astrophysics Small Explorer (SMEX), and Mission of Opportunity (MO) Preproposal Conference

Conference Goals and Overview of the Solicitations

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Conference Goals

The Astrophysics Explorers Program has released two solicitations for new science investigations:

- **2019 SMEX Explorer (SMEX) Announcement of Opportunity:** 2019 SMEX AO or NNH19ZDA011O
- **2019 Mission of Opportunity (MO)** Program Element Appendix (PEA) O for the Third Stand Alone Missions of Opportunity Notice (SALMON-3): 2019 MO SALMON-3 PEA O, or NNH17ZDA004O-APEXMO

Goals today are to:

- Provide an overview of the solicitations
- Provide an overview of the evaluation, categorization, and selection process for the SMEX and MO
- Address questions

Questions

- Answers to questions already received are included in presentations and/or will be addressed on the Q&A web site.
- Questions submitted today will be addressed as time permits and as appropriate answers can be generated.
- Please submit your questions in writing so that we may best understand your intent.
- WebEx users, please submit questions via the WebEx chat lines (preferred), or wait till lines are un-muted for phone questions.
- Questions may also be sent to Linda Sparke at:

  linda.s.sparke@nasa.gov
- Questions may be submitted until 21 days before the proposal due date. Questions and answers will be posted on the SMEX and MO pages at the Astrophysics Explorers Acquisition site:

  http://explorers.larc.nasa.gov/APSMEX2019/

Conference Agenda

10:00	Welcome	Paul Hertz, NASA HQ
10:05	Conference Goals and Overview	Linda Sparke, NASA HQ
10:25	Overview of the Evaluation, Categorization, & Selection Process	Linda Sparke, NASA HQ
10:45	Science Evaluation	Linda Sparke, NASA HQ
10:55	**Break**	
11:10	Technical, Management, and Cost Evaluation	Odilyn Luck, NASA SOMA
11:40	Explorers Program Overview	Greg Frazier, NASA GSFC
11:55	**Break**	
12:40	International Participation	Matt Koeppe, OIIR, NASA HQ
12:55	Export Control	Juan Santos, OIIR, NASA HQ
13:10	Mission Operations and Communications Services	Jerry Mason, NIMO, NASA HQ
13:30	ISS: Accommodation and Technical Interface Requirements Overview	Kenol Jules, NASA JSC
13:50	**Break**	
14:05	Launch Services (dedicated launch)	John Calvert, NASA KSC
14:25	Launch Services (rideshare)	Alicia Mendoza-Hill, NASA KSC
14:45	Cislunar CubeSat Opportunities	Jay Jenkins, NASA HQ
15:05	**Break**	
15:20	Cislunar Opportunities with SLS	Kimberly Robinson, NASA MSFC
15:40	Lunar Gateway Opportunities	Dina Contella, NASA JSC
16:00	Questions & Answers	All
16:15	Wrap-up	All

Astrophysics Explorers: Two Solicitations

2019 Small Explorer Announcement of Opportunity: 2019 SMEX AO = NNH19ZDA011O

Solicits proposals for **science investigations.** These must support the goals and objectives of the Explorer Program, and must be implemented by Principal Investigator (PI) led investigation teams, through the provision of **complete spaceflight missions**.

2019 Mission of Opportunity: 2019 MO SALMON-3 PEA O = NNH17ZDA004O-APEXMO

Solicits proposals for **Mission of Opportunity (MO) science investigations**. These must support the goals and objectives of the Explorer Program, must be implemented by Principal Investigator (PI) led investigation teams, through the provision of **space investigations**.

Important Note: These solicitations incorporate a large number of changes relative to the drafts and previous Explorer solicitations, including both policy changes and changes to proposal submission requirements. All proposers must read the solicitations carefully, and all proposals must comply with the requirements, constraints, and guidelines contained within.

Solicitations Overview

Milestone	Target Date
Notice of Intent to Propose	May 15, 2019
Proposal Submission Deadline 11:59 pm EST	August 1, 2019
Letters of Commitment due (w/proposal)	August 1, 2019
Deadline for Receipt of CD-ROM at 4:30 p.m. EST	August 7, 2019
Step 1 Selections announced, initiate Phase A Concept Studies (target)	Q2 CY 2020
Phase A Concept Study Reports due (target)	9 months later
Down-selection of Investigation(s) for flight (target)	Fall 2021
Launch Readiness Date for proposed mission	NLT May 2025
Commitment Need Date for a Partner MO	NLT Dec 2023
Launch Readiness Date for Small Complete Missions	NLT May 2025

SMEX AO Highlights

2019 SMEX AO is based on the SMD Standard AO template.

- **Requirements** are identified, numbered, and specific.
  - There are 101 requirements in the 2019 SMEX AO main body
  - When Sections do not levy requirements they do not have numbered requirements.
- **Evaluation Factors** are identified, numbered, and specific.
  - 5 for Science Merit
  - 6 for Scientific Implementation Merit and Feasibility
  - 5 for Technical, Management, and Cost (TMC) Feasibility
- Appendix B has numbered **requirements on Proposal Preparation**
  - There are 68 specific requirements for the format and content of Step 1 proposals [more altogether, as some Appendix B requirements have more than one part]

SMEX AO Highlights

- **Requirement 4**: Proposals shall describe a science investigation with goals and objectives that address the program science objectives described in Section 2.
- The PI-Managed Mission Cost (PIMMC) cap for a Medium Explorer (SMEX) mission is $145M in Fiscal Year (FY) 2020 dollars, not including standard AO-provided launch services, or any contributions.
- The sum of contributions of any kind to the entirety of the investigation is not to exceed one-third (1/3) of the proposed PIMMC.
- Any selected mission is intended to launch no later than May 2025.
- SMEX payloads are Class D, but are not eligible for streamlining.
- Proposers selected through this AO will be awarded a contract, capped at $2M FY2020 dollars, to conduct a 9-month Phase A concept study.

SMEX: Access to Space (LEO/GTO)

Launch services **may not** be arranged by the proposer; all access to space will be AO-provided. There is no charge against the PIMMC for AO-provided launch services, except as explicitly stated below.

- Standard launch services on an Expendable Launch Vehicle, as described in the summary document in the Program Library, will be provided at no charge against the PI-Managed Mission Cost. Any additional launch services must be funded out of the PIMCC.
- Rideshare as a secondary payload utilizing one or more ports on an Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) or ESPA Grande, to Low Earth Orbit or Geostationary Transfer Orbit, is provided at no charge to the PIMMC.
- NASA will provide accommodations on the International Space Station (ISS), and transportation to the ISS, at no cost to the PIMMC.

SMEX: Access to Space (cislunar)

- For payloads hosted on the lunar Gateway, NASA will provide transport, necessary accommodations, and use of the Gateway for data/comm relay. Interface requirements on the SMEX payload, preparing flight and ground safety data packages and participating in safety reviews, developing an integration verification plan, and conducting any related testing and analyses to satisfy the verification requirements, must be included within the PIMMC, as must costs for instrument or observatory operations and support for any contingency diagnostic activities.
- Rideshare on SLS (Space Launch System) launches may be proposed for payloads with maximum mass and dimensions comparable to those solicited for AO-provided rideshare to Low Earth Orbit or Geostationary Transfer Orbit. Such payloads may use the Gateway for data/comm relay.

Plans for the lunar Gateway and SLS launches are evolving rapidly. **Documents in the Program Library may be updated**, but no later than 30 days before the proposal due date. Proposers are responsible for checking for updates.

MO SALMON-3 PEA-O Highlights

2019 MO PEA O is an appendix to the SALMON-3 AO.

- **Requirements** are as given in SALMON-3, as amended by PEA O. The intent has been to standardize the two solicitations such that requirements are the same for the SMEX AO and the MO PEA.
- SALMON-3 Appendix B has **requirements on Proposal Preparation,** which are amended by PEA O:
  - In the event of an apparent conflict between the guidelines, the order of precedence is: the PEA O, then the SALMON-3 AO.
- **Evaluation Factors** are identified, numbered, and specific.
  - 5 for Science Merit
  - 6 for Scientific Implementation Merit and Feasibility
  - 5 for Technical, Management, and Cost (TMC) Feasibility

MO SALMON-3 PEA-O Highlights

Two types of mission may be proposed in response to this 2019 APEXMO SALMON-3 PEA:

- **Partner Missions of Opportunity (PMOs)**
- **Small Complete Missions (SCM)** including:
  - Investigations on rideshare payloads utilizing ESPA Access to Low Earth Orbit (LEO) or Geostationary Transfer Orbit (GTO)
  - Investigations using a Small Launcher
  - CubeSat Investigations deployed to Cislunar Space
  - Investigations on the International Space Station
  - Opportunities involving the lunar Gateway

MO SALMON-3 PEA-O Highlights

- The PI-Managed Mission Cost (PIMMC) cap is $75M in Fiscal Year (FY) 2020 dollars for Partner Missions of Opportunity, and for Full Small Complete Missions.
- The PIMMC cap is $35M (FY2020) for SmallSats, and for Cubesats up to 12U for ride to cislunar space. A SmallSat is a Small Complete Mission with PIMMC capped at $35M.
- CubeSats and CubeSat constellations packaged for ESPA rideshare (only) are solicited as SmallSats. Balloon-borne investigations are not solicited.
- Selected proposers will be awarded a contract, capped at $500K (FY2020), to conduct a 9-month Phase A concept study.
- Small Complete Missions must be ready to launch by May 2025.
- All Small Complete Missions are “Streamlined Class D”.
- For Partner Missions of Opportunity, the “need date” for NASA’s commitment must be earlier than December 2023. The launch date itself is not constrained.

MO Selection at Step 1

- The SALMON-3 AO provides that a proposal may be selected for development without first completing a Phase A concept study. The proposal must make the case that it is not only necessary, but that it is also technically feasible.
- The proposer must recognize that NASA would only make such a decision if the proposal was especially compelling.
- Recall, for this AO, KDP-A is the selection of a Step-1 proposal for a Phase A concept study, KDP-B is the downselection of a mission to enter Phase B following evaluation of Concept Study Reports.

Partner Missions of Opportunity

In addition to the requirements given in the SALMON-3 AO, all proposed PMO investigations must also demonstrate

- their formal relationship with the sponsoring agency's host mission (e.g., already selected contribution, invited contribution, or proposed contribution); and
- the status of the host mission within the sponsoring agency (i.e., Pre-Phase A, Phase A, or Phase B), including the level of commitment that the sponsoring agency has made to complete the mission.

PMOs may be proposed for participation in nonstrategic NASA missions, other than Explorer.

- the PI of the host mission must provide a Letter of Commitment endorsing the partnership
- the feasibility assessment of the host mission, i.e., the TMC evaluation in Step 1 and Step 2, shall include the accommodations for the PMO instrument

Partner Missions of Opportunity on ISS

In addition to requirements given in SALMON-3, all PMO requiring flight on the International Space Station must also provide a Letter of ISS Technical Interface and Resource Accommodation Feasibility Assessment from the NASA Space Station Research Integration Office. This letter must contain:

1) a description of the formal relationship with the sponsoring agency's host mission for access and accommodation at the space station,
2) identification of known challenges and/or conditional provisions for access or accommodation of the host mission, and
3) a description of the level of technical interchange and negotiation required to mature the host mission's provisions for access and accommodation.

Small Complete Missions on ISS

In addition to requirements given in SALMON-3, all SCM investigations requiring flight on the ISS must also provide a Letter of ISS Technical Interface and Resource Accommodation Feasibility Assessment from the NASA Space Station Research Integration Office containing:

1) a preliminary assessment of the feasibility of proposed provisions for access to and accommodation on the ISS,
2) identification of known technical interface challenges and/or conditional provisions for access or accommodation, and
3) a description of the level of technical interchange and negotiation required to mature the proposed provisions for access and accommodation.

Access to Space for SCM: Earth Orbit

Launch services **may not** be arranged by the proposer; all access to space will be PEA-provided. There is no charge against the PIMMC for PEA-provided launch services, except as explicitly stated below.

- Rideshare as a secondary payload utilizing one or more ports on an Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) or ESPA Grande, to Low Earth Orbit or Geostationary Transfer Orbit, to LEO/GTO will be provided to **SmallSats** at no charge against the PI-Managed Mission Cost. For Full SCMs, there is a charge of $10M against the PIMCC.
- For both Full SCM and SmallSats, access to space on a small launcher is provided at a cost of $10M - $15M to the PIMMC.
- For both Full SCM and SmallSats, NASA will provide accommodations on the International Space Station (ISS), and transportation to the ISS, at no cost to the PIMMC.

Access to Space for SCM: cislunar space

- For CubeSats up to 12U, access to cislunar space as a rideshare on SLS EM-2, or via the Commercial Lunar Payload Service (CLPS) will be provided at no charge to the PIMMC. Such payloads may use the Gateway for data/comm relay.
- For payloads hosted on the lunar Gateway, NASA will provide transport, necessary accommodations, and use of the Gateway for data/comm relay. Interface requirements on the SMEX payload, preparing flight and ground safety data packages and participating in safety reviews, developing an integration verification plan, and conducting any related testing and analyses to satisfy the verification requirements, must be included within the PIMMC, as must costs for instrument or observatory operations and support for any contingency diagnostic activities.

Plans for the lunar Gateway and for rideshare to cislunar space are evolving rapidly. **Documents in the Program Library may be updated**, but no later than 30 days before the proposal due date. Proposers are responsible for checking for updates.

Science Enhancement Options: SMEX and MO

- Science Enhancement Options (SEOs) are optional activities such as programs for guest investigators, general observers, participating scientists, interdisciplinary scientists, and archival data analysis, that have the potential to broaden the scientific impact of investigations.
- Costs for proposed SEO activities will not count against the PI-Managed Mission Cost cap.
- Plans and costs for proposed SEO activities must be defined in the Step 2 Concept Study Report. No information on SEOs is needed for the Step-1 proposal.
- If an SEO is included at Step 1 it will be evaluated, but the evaluation will not affect the proposal rating for Scientific Merit or Science Implementation and Feasibility Merit of the proposed investigation.
- See SMEX AO section 5.1.5, requirements 12-14; SALMON-3 section 5.2.5, requirements 22-24.

Student Collaboration: SMEX and MO

- Proposals may define a Student Collaboration (SC) that is a separate part of the proposed investigation. This could be an instrument development, an investigation of scientific questions, development of supporting hardware or software, or other aspects of the investigation. SMD policy states that undergraduate students are a priority for Student Collaborations.
- Plans and costs for proposed student collaborations must be defined in the Step 2 Concept Study Report. The intrinsic merit of student collaborations will not be evaluated at Step 1.
- Proposals must show that the SC is clearly separable from the implementation of the Baseline Science Mission.
- Student Collaboration proposals, if any, will be evaluated only for the impact they have on mission feasibility.
- See SMEX AO Section 5.5.3, MO PEA Section 5.5.2.

Education, Communication and Public Outreach: SMEX and MO

- **No Education Plan is required, nor will one be reviewed if provided.**
- **No information on a Communications and Outreach Program Plan is required for the Step-1 proposal.** A Communications and Outreach program (previously referred to as Public Outreach) is required, but it must be developed during Phase B of the mission. The plan must include topline messaging, target audiences, and media processes linked to reaching target audiences, with detailed budgets, milestones, metrics and timelines, and reporting requirements. Mission-related communications are funded directly through a NASA center or JPL, and are not within the PIMMC.
- See Section 5.5.2 of the SMEX AO, Section 5.5.1 of the MO PEA.

SMEX AO Highlights (MO too!)

Be on Time: NOI and Proposals

Section 6.1.2: NOIs are due by 11:59pm Eastern time on 15 May 2019, via NSPIRES. Proposals will not be accepted without prior submission of a NOI.

Requirement 1: Proposals submitted in response to this solicitation shall be submitted electronically no later than the Electronic Proposal Submittal Deadline. (11:59pm on 1 August)

Requirement 82: Every Proposal Team member shall indicate his/her commitment to the proposed investigation and specifically to the role, responsibilities, and participating organization proposed for him/her, through NSPIRES. The Proposal Team is defined to include... all named Key Management Team members, all Co-Is, and all collaborators. No Institutional letters of commitment are required for the contributed effort of collaborators.

SMEX AO Highlights (MO too!)
CD-ROMS

Requirement 2: In addition to electronic submission, two CD-ROMs containing the proposal and relevant files described in Section 6.2.3 must be submitted. Proposals on CD-ROMs submitted in response to this solicitation shall be delivered no later than the Deadline for Receipt of Proposal on CD-ROMs and shall be delivered to the address for submittal of proposals given in Section 6.2.3 of the AO.

Address for delivery of CD-ROMs (Requirement 100):

NASA Research and Education Support Services (NRESS)
Suite 500
2345 Crystal Drive
Arlington, VA 22202
Telephone for commercial delivery: 202-479-9030
NASA will notify proposers that the CD-ROMs have been received.

SMEX AO Highlights (MO too!)
Export-Controlled Material

Requirement 83: If the proposal contains export-controlled material, the material shall be printed in a red font or enclosed in a red box. This statement, with specific references included, shall be prominently displayed in Section A of the proposal (following the Proposal Summary Information):
"The information (data) contained in [insert page numbers or other identification] of this proposal is (are) subject to U.S. export laws and regulations. It is furnished to the Government with the understanding that it will not be exported without the prior approval of the proposer under the terms of an applicable export license or technical assistance agreement. The identified information (data) is (are) printed in a red font and figure(s) and table(s) containing the identified information (data) is (are) placed in a red-bordered box."

Proposers are required to be specific about export-controlled material. Science panels often include non-US scientists. Proposers should expect that **all science reviewers will see a version of the proposal with the export-controlled material removed.**