National Aeronautics and Space Administration

Heliophysics Explorers Program (HEP) 2022 Small Explorer (SMEX) and Explorer Mission of Opportunity (MO) Announcements of Opportunity (AOs)

Preproposal Conference: Evaluation, Categorization, and Selection Overview

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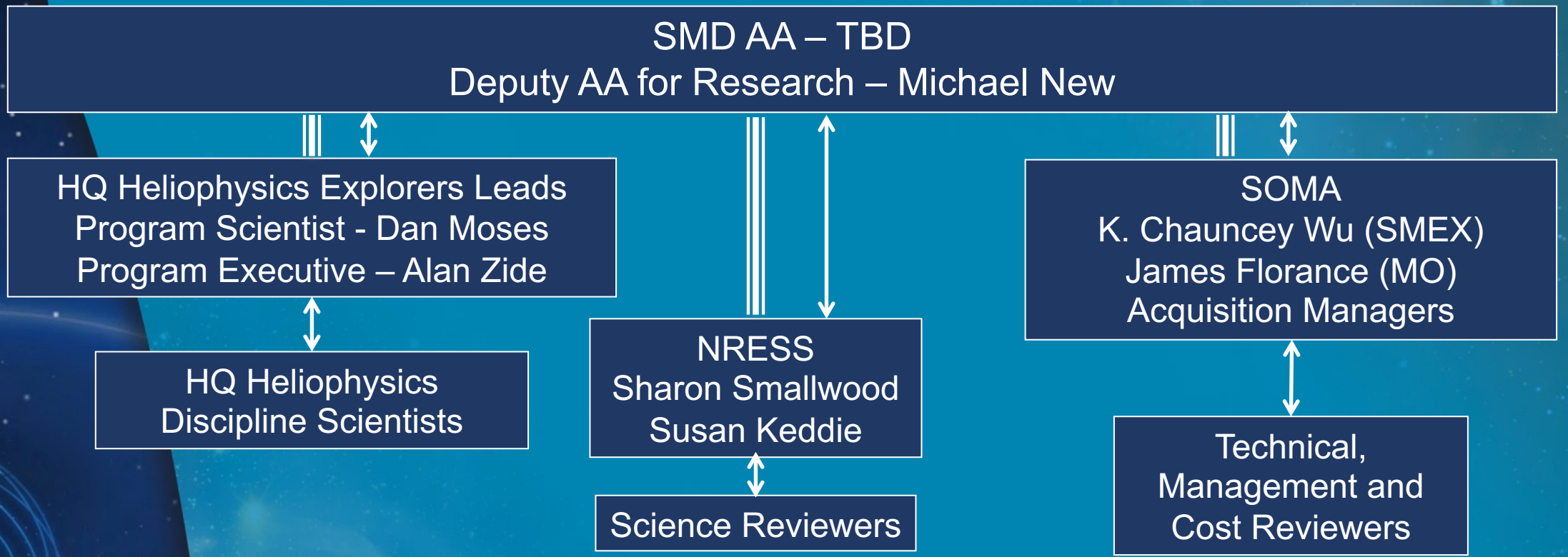
2022 Heliophysics Explorer Team



Programmatic Direction
Information and Coordination

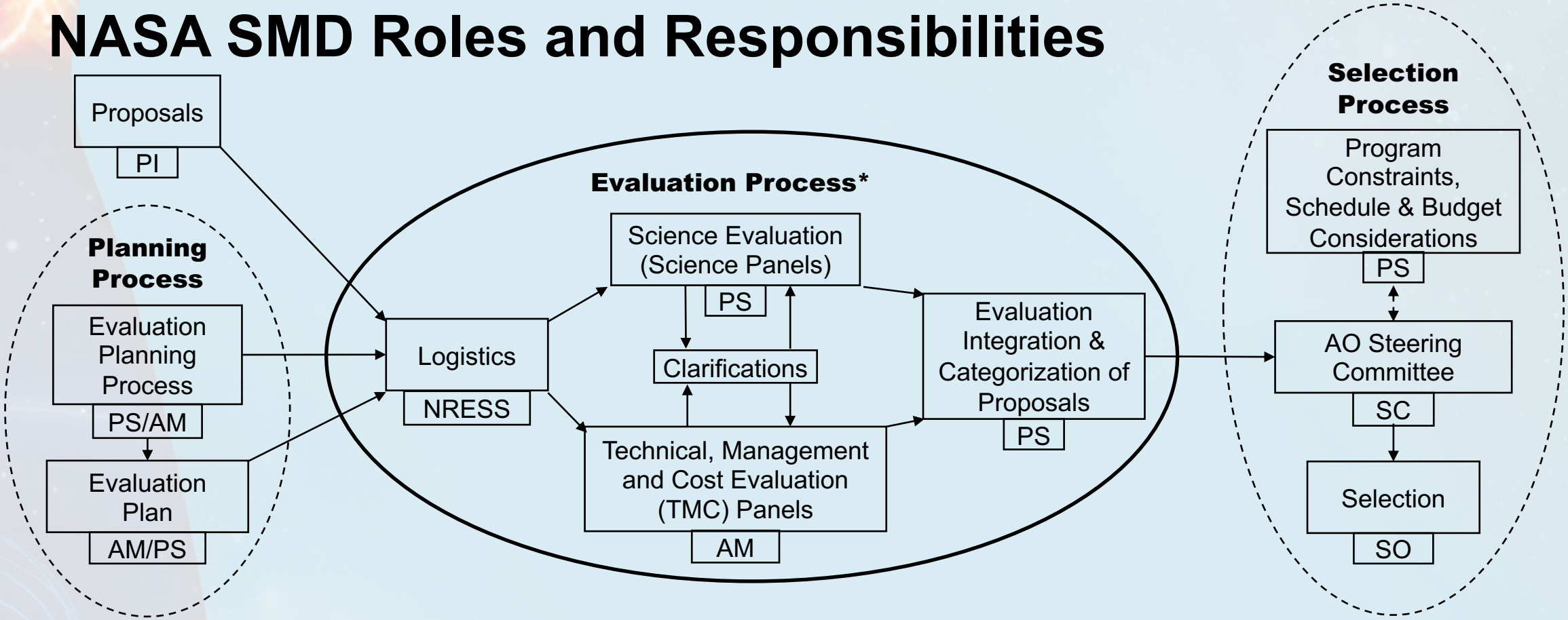
SOMA: Science Office for Mission Assessments
NRESS: NASA Research & Education Support Services

Science Office for Mission Assessments (SOMA)

- The NASA Science Mission Directorate (SMD) **Science Office for Mission Assessments (SOMA)** was established in 1996 to support the Discovery and Explorer Programs. The office now supports also the New Frontiers, Mars Scout, Earth System Science Pathfinder (ESSP), and others.

- The Technical, Management, and Cost (TMC) process is a standard process used by SOMA to support all SMD evaluations. Lessons learned from each evaluation are incorporated into the process for continuous improvement.

NASA SMD Roles and Responsibilities

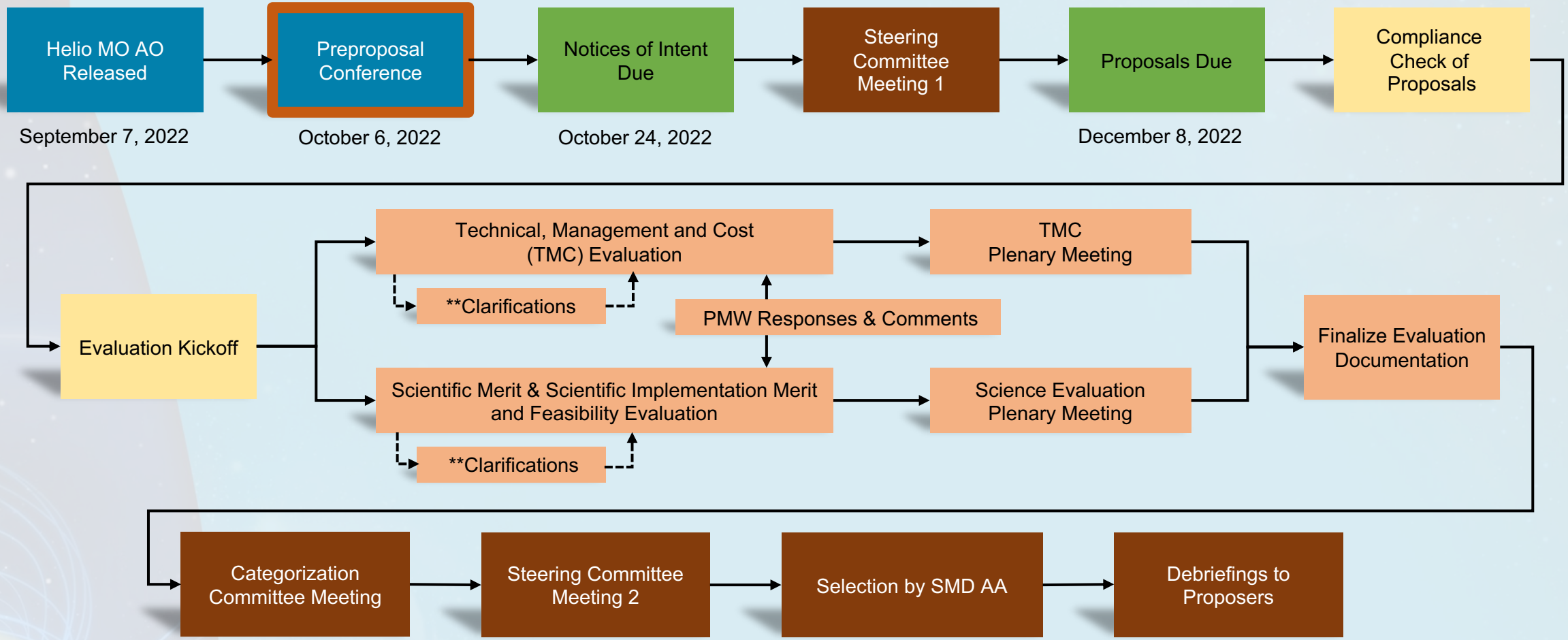


PI = Principal Investigator
PS = Program Scientist
AM = Acquisition Manager

NRESS = NASA Research and Education Support Services
SC = AO Steering Committee Chair
SO = Selecting Official

** The Evaluation Process is addressed in this document.*

Proposal Evaluation Flow



Two-Step Competitive Process

2022 SMEX and MO investigations will be evaluated and selected through a two-step competitive process.

- Step 1 is the solicitation, submission, evaluation, and selection of proposals prepared in response to this AO.
- As the outcome of Step 1, NASA intends to fund approximately three Step-1 SMEX proposals and up to four MO proposals to proceed to a Phase A concept study and submit Concept Study Reports to NASA.
- Step 2 is the preparation of the Concept Study Reports, their submission and evaluation, followed by a continuation decision (down-selection).
- As the outcome of Step 2, NASA intends to select approximately one SMEX investigation and one or more MO investigations to proceed into Phase B and subsequent mission phases.
- *However*, in Step 1, NASA may choose to select MO proposals that are sufficiently compelling and with sufficient technical maturity to proceed into Phase A development without further competition. NASA would only make such a decision if the proposal was especially compelling (MO AO Section 1.1). There is no special process to request that a proposal be considered for selection at Step 1.
- The PIMMC may not increase by more than 20% from that in the Step-1 proposal during the entirety of Phase A, and, in any case, must not exceed the AO Cost Cap or Adjusted AO Cost Cap.

A proposal must be understandable as a self-contained document

Requirement B-1. A proposal shall … contain all data and other information that will be necessary for scientific and technical evaluations; provision by reference to external sources, such as Internet websites, of additional material that is required for evaluation of the proposal is prohibited.

Furthermore, evaluators are selected to provide a cross-section of the science and engineering community with the goal of having specialized expertise in every relevant topic. However, Conflict of Interest constraints on panel members will occasionally require compromises in the level of specialization available on a given topic, due to the limited size of some specialist communities. Thus, successful proposals must be written in such a way that specialized expertise is not required for comprehension.

Requirements Deferred to Step 2 (1 of 3)

The following proposal requirements have been deferred until Step 2, or at the end of Phase A if NASA chooses a one-step selection.

- Independent Verification and Validation of Software (Section 4.6.1)
- Costing of Conjunction Assessment Risk Analysis (Section 4.6.4)
- Planetary protection requirements (Section 5.1.7)
- Science Enhancement Option or its cost (Section 5.1.8)
- Enhancing Technology Demonstration Opportunity or its cost (Section 5.2.3.1)
- Applicable maximum channel bandwidth (Section 5.2.5)
- Critical Event Coverage planning (Section 5.2.6) (***Critical Events must be identified***)
- Detailed plan for orbital debris and disposal (Section 5.2.7 and Requirements B-63 through B-66)
- Mission Operations Tools and Services (Section 5.2.9)
- Cybersecurity (Section 5.2.11)

References are for the SMEX AO, Explorer MO AO Section 1.1 provides references for MO deferrals

Requirements Deferred to Step 2 (2 of 3)

Continued list of proposal requirements deferred until Step 2, or at the end of Phase A if NASA chooses a one-step selection.

- Naming of Project Manager and Project Systems Engineer (Sections 5.3.2 and 5.3.3)
- Student Collaboration plans (Section 5.5.2 and Requirement B-53)
- AO-Provided Launch Services storage plans and budget (Section 5.9.2.1)
- Discussion of cost estimate error and uncertainty (Section 5.6.3)
- Institutional Letters of Commitment from major partners (Section 5.8.1)
- Schedule-based end-to-end component of Data Management and Archive Plans (Requirement B-24)
- Requirements for real year dollar costs: only costs in FY 2022 dollars are required in the Step 1 proposal (Section 5.6.2, Requirements B-13, B-51, and B-52)

Ground systems and facilities will not be evaluated under Factor C-2 (Section 7.2.4) Details on each deferral are provided in the applicable section(s).

References are for the SMEX AO, Explorer MO AO Section 1.1 provides references for MO deferrals

Requirements Deferred to Step 2 (3 of 3): Costs

- Many deferred requirements involve cost to successfully implement
  - These costs must be covered within PIMMC unless otherwise specified.
- Approximations of cost in Step 1 to account for deferred requirements are encouraged
- **The limitations in cost fidelity for delayed requirements is an important reason Step 1 proposals at the AO Cost Cap with minimum reserves are strongly discouraged**
  - Maximum cost growth from Step 1 to Step 2 is limited to 20%

- Other cost issues:
  - **NEW** Cost of Earned Value Management (EVM) **certification** is now outside PIMMC for missions with this requirement.
    - Step 1 Proposals must include management plans compliant with AO & references, including the use of EVM when appropriate.
    - The cost impact of EVM certification (if any) will not provide a competitive advantage
  - EVM-lite has utility for all mission development efforts

Evaluation

Evaluation Criteria:

1. Scientific Merit of the Proposed Investigation (Section 7.2.2);
2. Scientific Implementation Merit and Feasibility of the Proposed Investigation (Section 7.2.3);
3. TMC Feasibility of the Proposed Mission Implementation, including Cost Risk (Section 7.2.4).

Weighting:
Criterion 1 - approximately 40%
Criterion 2 - approximately 30%
Criterion 3 - approximately 30%

Other Selection Factors (Section 7.3):

- Programmatic factors
- PI-Managed Mission Cost

Panel Review

- All proposals will be initially screened to determine their compliance to requirements and constraints of the applicable AO
- Proposals that do not comply may be declared noncompliant and returned to the proposer without further review. A submission compliance checklist is provided in the 2022 SMEX and Explorer MO AOs.
- Compliant proposals will be evaluated against the criteria specified in Section 7.2 of the AOs by panels of individuals who are peers of the proposers.
- Proposals will be evaluated by a science panel and a technical/management/cost panel; the panels evaluate proposals against different criteria.
- Panel members will be instructed to evaluate every proposal independently without comparison to other proposals.
- These panels may be augmented through the solicitation of non-panel (‘mail in’) reviews, which the panels have the right to accept in whole or in part, or to reject.

Evaluation Findings

- Proposals are evaluated against the selection criteria listed in the AO
  - Form A: Scientific Merit of the Proposed Investigation
  - Form B: Scientific Implementation Merit and Feasibility of the Investigation
  - Form C: TMC Feasibility of the Proposed Mission Implementation
- For each factor, a finding is established
  - *As Expected, Proposal fully meets but does not exceed minimum fulfillment of the factor objective.*
  - *Strength: Proposal exceeds in fulfilling a factor.*
  - *Weakness: Proposal does not fully meet the factor objective.*
- Each Strength and Weakness finding is accompanied by a narrative justification and is ranked as either*:*
  - *Major - impacts the success of the investigation*
  - *Minor - noted but does not impact investigation success*
    - *All minor weaknesses should be addressed should the proposal move forward in process*

Clarification Process

- Before finalizing the evaluation, NASA will provide an opportunity for clarification on all potential major weaknesses in the Science Merit, Science Implementation Merit, and TMC Feasibility of Mission Implementation that were identified in the proposal.
- Proposers will receive communication in advance of the clarification round(s) with notification of the schedule, requirements, and limitations. Clarifications from the science panel may be sent separately from those from TMC.
- On the day of the clarification round, proposers will receive a second communication with the potential major weaknesses and instructions for responding. Proposers will have at least 48 hours to respond.
- **New process for responses:** proposers may use 8 pages (total for science) and 6 pages (for TMC) to address all potential major weaknesses from that panel. Details on the required format, and what may be included, are in today's SOMA presentation, and will be posted in the Evaluation Plan. Proposers must decide how best to use those pages: e.g. by concentrating on responses that are most likely to persuade the reviewers that no major weakness exists.
- Responses that go beyond the permitted response format will be deleted and will not be provided to the evaluation panels.

Categorization

Categorization Process and Proposal Categories

- Upon completion of the evaluations, NASA will convene a Categorization Committee, composed wholly of CS and IPA appointees (some of whom may be from Government agencies other than NASA) and appointed by the SMD Associate Administrator.
- The Categorization Committee will consider the peer review results and, based on the evaluations, categorize the proposals in accordance with procedures required by NFS 1872.404. The categories are defined in NFS 1872.404(k) as follows:

Category I. Well-conceived, meritorious, and feasible investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that data can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.

Category II. Well-conceived, meritorious, and feasible investigations that are recommended for acceptance, but at a lower priority than Category I, whatever the reason.

Category III. Meritorious investigations that require further development. Category III investigations may be funded for further development and may be reconsidered at a later time for the same or other opportunities.

Category IV. Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason.

Selection

Steering Committee

- The AO Steering Committee will conduct an independent assessment of the Evaluation and Categorization processes regarding their compliance to established policies and practices, as well as the completeness, self-consistency, and adequacy of all supporting materials.

Selection by SMD Associate Administrator

- The evaluation results will be presented to the Associate Administrator for the Science Mission Directorate, who will make the final selections. As the Selection Official, they may consult with senior members of SMD and the Agency concerning the selections.
- The Selection Official may consider a wide range of programmatic factors in deciding whether to select any proposals and in selecting among selectable proposals, including, but not limited to, planning and policy considerations, available funding, programmatic merit and risk of any proposed partnerships, and maintaining a programmatic balance across the mission directorate(s).
- As part of the selection decision, a decision will be made as to whether any Category III proposals will receive funding for technology development.

Post-Selection Debriefings

- Proposers of investigations will be notified in writing and offered oral debriefings for themselves and representatives from each of their main partners.
- Written debriefing materials will be provided ahead of the time of the oral debriefing. Such debriefings may be in person at NASA Headquarters or by telephone/videoconference.

References

SMEX and MO Reference Material

2022 Heliophysics SMEX and Explorer MO Acquisition Page

The 2022 Heliophysics SMEX and Explorer MO acquisition home page is available at https://explorers.larc.nasa.gov/HPSMEX22/

The contents of the web site include the following:

- Links to SMEX and Explorer MO pages
- 2022 Heliophysics SMEX and Explorer MO news
- Preproposal conference
- Community announcements
- SAM.gov
- SMEX and MO Q&As
- Teaming interest

SMEX Reference Material

2022 Heliophysics SMEX Acquisition Home Page

- The 2022 Heliophysics SMEX Acquisition Home Page available at https://explorers.larc.nasa.gov/HPSMEX22/SMEX/index.html, will provide updates and any addenda during the solicitation process.

2022 Heliophysics SMEX Program Library

- The Library provides additional regulations, policies, and background information. The Library is accessible at https://explorers.larc.nasa.gov/HPSMEX22/SMEX/programlibrary.html
- It is incumbent upon the proposer to ensure that the documents used in proposal preparation are of the date and/or revision available in the Program Library.
- A detailed Change Log has been implemented, and will continually document updates to the Program Library.

MO Reference Material

2022 Heliophysics Explorer MO Acquisition Home Page

- The 2022 Heliophysics Explorer MO Acquisition Home Page available at https://explorers.larc.nasa.gov/HPSMEX22/MO/index.html, will provide updates and any addenda during the solicitation process.

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- A detailed Change Log has been implemented, and will continually document updates to the Program Library.

Questions?

All further questions pertaining to the SMEX AO or Explorer MO AO

MUST be addressed by email to:

Dr. Dan Moses
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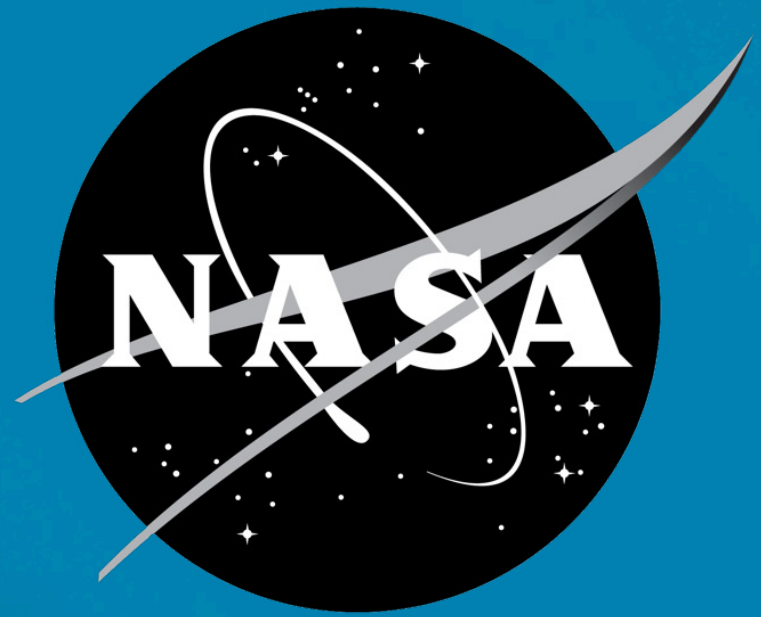
Science Mission Directorate
NASA Headquarters
Washington, DC 20546
dan.moses@nasa.gov
(subject line to read “SMEX AO or Explorer MO AO as applicable")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