

Heliophysics Space Weather Vigil Focused Mission of Opportunity Solicitation

Pre-Proposal Conference
Science Review

James Spann – Heliophysics Lead, Vigil FMO Program Scientist
Heliophysics Division, Science Mission Directorate
NASA Headquarters

July 13, 2023

Outline

- Review Structure
- Evaluation Criteria
- Questions

9

12

21

Evaluation Organization

Evaluation Panel

James Spann, Program Scientist
Jamie Favors, Program Executive
Science Mission Directorate (SMD), NASA Headquarters

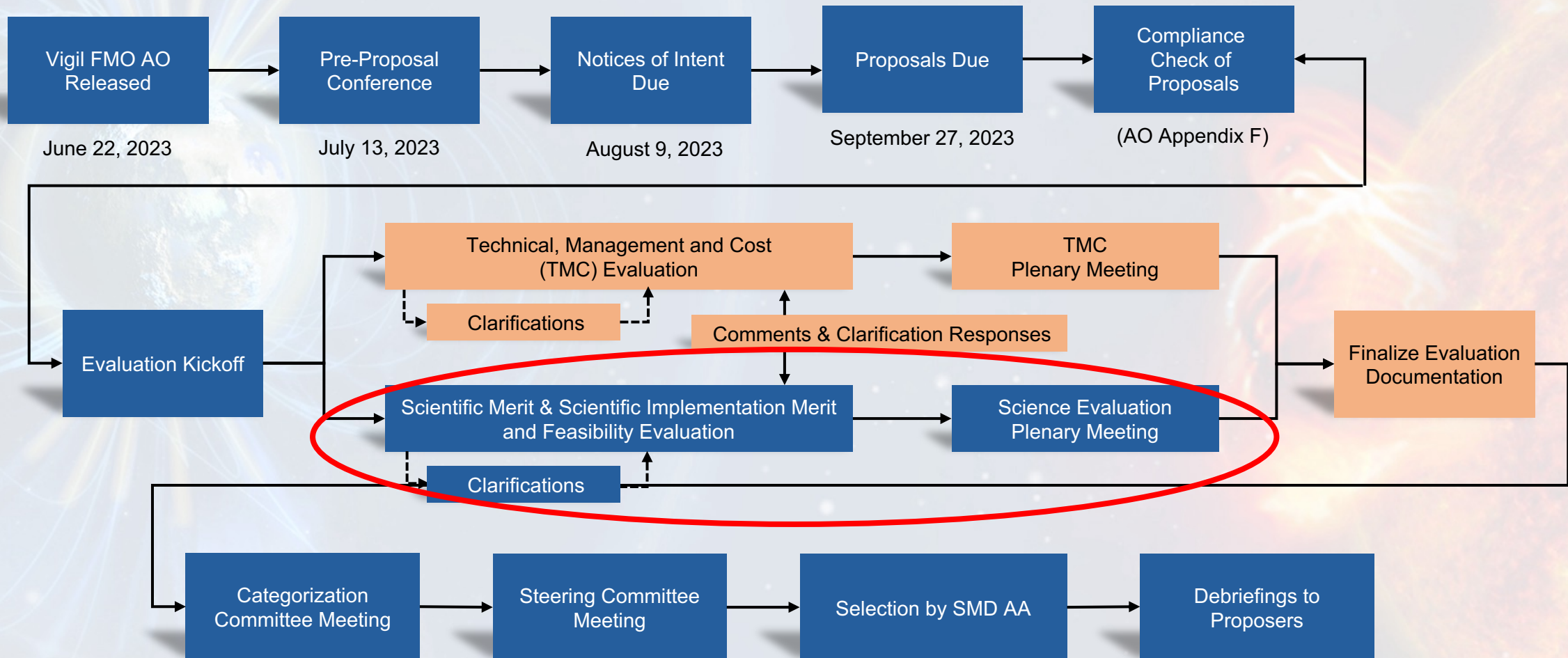
Science Evaluation Panel

James Spann, Program Scientist
Jamie Favors, Program Executive
Heliophysics Division, SMD

TMC Evaluation Panel

Washito Sasamoto, Acquisition Manager (AM)
Omar Torres, Backup AM
NASA Science Office for Mission Assessments (SOMA)

Process, Solicitation Flow



The background is a composite of three distinct astronomical images. On the left, a view of Earth from space shows blue and white magnetic field lines emanating from the poles. The center features a vast field of stars in various colors (blue, white, yellow) against a dark blue background. On the right, a close-up of a star's surface is shown in vibrant orange and red, with visible solar flares and granulation.

Review Structure

Science Review, TMC Review

- Science Review and TMC Review are conducted independently
 - Evaluators in one review do not interact with evaluators for or participate in other review
- Exchanges between Science and TMC Reviews are permissible but limited
 - Exchanges are informational, non-evaluative
 - Exchanges are documented in writing, facilitated through Program Scientist and Acquisition Manager

Evaluators, Science Review

- Program Scientist is responsible for managing the science evaluators
 - Identifies and invites individual evaluators
 - Ensures evaluators sign and adhere to Non-Disclosure Agreement (or equivalent)
- Science evaluators are selected based on proposal content, avoiding disqualifying conflicts of interest
 - Individuals with necessary expertise in at least one of the relevant scientific, technical areas
 - Requirement B-1 - A proposal shall consist of one file comprising readily identifiable sections that correspond and conform to Sections A through J of this appendix. It shall be written in English and shall employ metric (SI) and/or standard astronomical units, as applicable. It shall contain all data and other information that will be necessary for scientific, VC operational, 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.
 - Individual, institutional conflicts of interest are defined by SPD-01A, Handling Conflicts-of-Interest for Peer Reviews



Evaluation Criteria

Evaluation Criteria

- Scientific VC operational merit of the proposed investigation. Form A
 - The information provided in a proposal will be used to assess the intrinsic scientific and VC operational merit of the proposed investigation. Scientific and VC operational merit will be evaluated for the Baseline Investigation and the Threshold Investigation; Science Enhancement Options beyond the Baseline Investigation will not contribute to the assessment of the scientific and VC operational merit of the proposed investigation.
- Scientific and VC operational implementation merit and feasibility of the proposed investigation. Form B
 - The information provided in a proposal will be used to assess merit of the plan for completing the proposed investigation, including the scientific and VC operational implementation merit, feasibility, resiliency, and probability of scientific and VC operational success of the proposed investigation.
- Technical, management, and cost (TMC) feasibility of the proposed mission implementation. Form C.
 - The technical and management approaches of all submitted investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule.

Evaluation Criteria

- Scientific VC operational merit of the proposed investigation. Form A
 - The information provided in a proposal will be used to **assess the intrinsic scientific and VC operational merit of the proposed investigation**. Scientific and VC operational merit will be evaluated for the Baseline Investigation and the Threshold Investigation; Science Enhancement Options beyond the Baseline Investigation will not contribute to the assessment of the scientific and VC operational merit of the proposed investigation.
- Scientific and VC operational implementation merit and feasibility of the proposed investigation. Form B
 - The information provided in a proposal will be used to **assess merit of the plan for completing the proposed investigation**, including the scientific and VC operational implementation merit, feasibility, resiliency, and probability of scientific and VC operational success of the proposed investigation.
- Technical, management, and cost (TMC) feasibility of the proposed mission implementation. Form C.
 - The technical and management approaches of all submitted investigations will be evaluated to **assess the likelihood that they can be successfully implemented as proposed**, including an assessment of the likelihood of their completion within the proposed cost and schedule.

Evaluation criteria are mutually exclusive

Evaluation Criteria

- Scientific VC operational merit of the proposed investigation. Form A
 - The information provided in a proposal will be used to assess the intrinsic scientific and VC operational merit of the proposed investigation. Scientific and VC operational merit will be evaluated for the Baseline Investigation and the Threshold Investigation; Science Enhancement Options beyond the Baseline Investigation will not contribute to the assessment of the scientific and VC operational merit of the proposed investigation.
- Scientific and VC operational implementation merit and feasibility of the proposed investigation. Form B
 - The information provided in a proposal will be used to assess merit of the plan for completing the proposed investigation, including the scientific and VC operational implementation merit, feasibility, resiliency, and probability of scientific and VC operational success of the proposed investigation.
- Technical, management, and cost (TMC) feasibility of the proposed mission implementation. Form C.
 - The technical and management approaches of all submitted investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule. – Presented later by Washito Sasamoto

Scientific Merit... (A Factors)

- **Factor A-1. Compelling nature and scientific priority of the proposed investigation's science goals and objectives.** This factor includes the clarity of the goals and objectives; how well the goals and objectives reflect program, Agency, and national priorities; the potential scientific impact of the investigation on program, Agency, and national science objectives; and the potential for fundamental progress, as well as filling gaps in our knowledge relative to the current state of the art. This evaluation factor also includes the extent to which the proposed science investigation addresses national applications objectives for proposals that include an applications dimension.
- **Factor A-2. Programmatic value of the proposed investigation. This factor includes the unique value of the investigation to make scientific and VC operational progress in the context of Vigil, as well as other ongoing and planned missions;** how well this investigation addresses national objectives in space weather to advance understanding and enable better forecasting; the relationship to the other elements of NASA's science programs; how well the investigation may synergistically support ongoing or planned missions by NASA and other agencies; and the necessity for a space investigation to realize the goals and objectives. This evaluation factor also includes the extent to which the proposed investigation addresses unique science and application areas that are not being addressed by other missions (both NASA and non-NASA missions) expected to be in operation at the start of the proposed investigation.

Scientific Merit... (A Factors)

- Factor A-3. Likelihood of scientific and VC operational success. This factor includes how well the anticipated measurements support the goals and objectives; the adequacy of the anticipated data to complete the investigation and meet the goals and objectives; and the appropriateness of the investigation requirements for guiding development and ensuring scientific and VC operational success.
- Factor A-4. Scientific and VC operational value of the Threshold Investigation. This factor includes the scientific and VC operational value of the Threshold Investigation using the standards in the first factor of this section and those in Section 2.3.1, and whether that value is sufficient to justify the proposed cost of the project.

Factors A-1 through A-3 are evaluated for the Baseline Investigation assuming it is implemented as proposed and achieves technical success. Factor A-4 is similarly evaluated for the Threshold Investigation.

Scientific Impl... (B Factors)

- **Factor B-1. Merit of the instrument and investigation design for producing anticipated data to address the science goals and objectives and VC operational objectives.** This factor includes the degree to which the proposed investigation will address the goals and objectives; the appropriateness of the selected instrument(s) and investigation design for addressing the goals and objectives; the degree to which the proposed instrument(s) and investigation can provide the necessary data; and the sufficiency of the data gathered to complete the scientific investigation and meet VC operational requirements.
- **Factor B-2. Probability of technical success.** This factor includes the maturity and technical readiness of the instrument(s) or demonstration of a clear path to achieve necessary maturity; the adequacy of the plan to develop the instrument(s) within the proposed cost and schedule; the robustness of those plans, including recognition of risks and mitigation plans for retiring those risks; the likelihood of success in developing any new technology that represents an untested advance in the state of the art; the ability of the development team—both institutions and individuals—to successfully implement those plans; and the likelihood of success for both the development and the operation of the instrument(s) within the investigation design.

Scientific Impl... (B Factors)

- **Factor B-3. Merit of the Open Science/VC Operations and Data Management Plan including data analysis, Data Management Plan, Software Management Plan, and Open Science Plan.** This factor includes the merit of plans for data analysis and data archiving to meet the goals and objectives of the investigation; to result in the publication of science discoveries in the professional literature; and to preserve data and analysis of value to the science community. Considerations in this factor include assessment of planning and budget adequacy and evidence of plans for well-documented, high-level data products and software usable to the entire science community; assessment of adequate resources for physical interpretation of data; reporting scientific results in the professional literature (e.g., refereed journals); and assessment of the proposed plan for the timely release of the data to the public domain for enlarging its science impact.
- **Factor B-4. Resiliency. This factor includes both developmental and operational resiliency.** Developmental resiliency includes the approach to descoping the Baseline Investigation to the Threshold Investigation if development problems force reductions in scope. Operational resiliency includes the ability to withstand adverse circumstances, the capability to degrade gracefully, and the potential to recover from anomalies in flight.

Scientific Impl... (B Factors)

- Factor B-5. Probability of team success. This factor will be evaluated by assessing the experience, expertise, and organizational structure of the science and VC operations team and the investigation design considering any proposed instruments. The scientific expertise of the PI will be evaluated but not their experience with NASA investigations. The role of each Co-Investigator will be evaluated for necessary contributions to the proposed investigation; the inclusion of Co-Is who do not have a well-defined and appropriate role may be cause for downgrading during evaluation.
- Factor B-6. Merit of the Diversity and Inclusion Plan. This factor includes the alignment of the proposal with NASA's core value of inclusion, the effectiveness of the plan in achieving its objectives in the context of mission success, the inclusion of mentoring and career development opportunities to train the next generation of science leaders, and transparency of annual reporting to NASA. This factor will be evaluated solely by IDEA SMEs but it will not be provided a separate grade or score.

Scientific Impl... (B Factors)

- Factor B-7. Maturity of proposed Level 1 science and VC operations requirements and Level 2 project requirements. This factor includes assessment of whether the Level 1 science and VC operations requirements are mature enough to guide the achievement of the objectives of the Baseline Investigation and the Threshold Investigation, and whether the Level 2 requirements are consistent with the Level 1 requirements. The Levels 1 and 2 requirements will be evaluated for whether they are stated in unambiguous, objective, quantifiable, and verifiable terms that do not conflict and for whether they are traceable to the science objectives. They will be evaluated for the adequacy, sufficiency, and completeness, including their utility for evaluating the capability of the instrument(s) and other systems to achieve the investigation objectives.

The image is a composite of three distinct astronomical scenes. On the left, a view of Earth from space shows its blue and white surface, with a complex network of glowing blue and yellow magnetic field lines extending into the dark void of space. The background is a vast field of stars, ranging from small white specks to larger, more prominent blue and yellow stars with diffraction spikes. On the right side, a large, detailed view of the Sun is shown, characterized by its intense orange and red colors and a turbulent, fiery surface with visible solar flares and sunspots.

Questions?

All further questions pertaining to the Vigil FMO AO
MUST be addressed by email to:

James Spann
Vigil FMO Program Scientist
Science Mission Directorate
NASA Headquarters
Washington, DC 20546
jim.spann@nasa.gov

Washito Sasamoto
Vigil FMO Acquisition Manager
Science Office for Mission Assessments
Langley Research Center
Hampton, VA
washito.a.sasamoto@nasa.gov

(subject line to read "Vigil FMO AO
Questions")

