2023 HELIOPHYSICS SPACE WEATHER FOCUSED MISSION OF OPPORTUNITY (FMO) COMMUNITY ANNOUNCEMENT

The National Aeronautics and Space Administration (NASA) Science Mission Directorate (SMD) Heliophysics Division (HPD) has released this Community Announcement as a special notice on SAM.gov under Notice ID NNH22ZDA019L concerning its intention to release a draft Announcement of Opportunity (AO). The forthcoming AO will solicit a Principal Investigator (PI)-led Heliophysics Space Weather Science Program (SWSP) Focused Mission of Opportunity (FMO) investigation for a remote sensing extreme ultraviolet (EUV) imager instrument to be hosted on the European Space Agency (ESA) Vigil mission.

Vigil is an ESA Space Safety Programme space weather mission to observe the Sun from the Sun–Earth Lagrange point L5. The Vigil mission will complement measurements made from the Lagrange point L1 by providing a view of the Sun away from the direct Sun–Earth line. This will give visibility of the propagation of plasma clouds emitted by the Sun toward Earth, as well as views of the solar disk before it rotates into view from Earth. The Vigil mission will carry out heliospheric imaging of the space between the Sun and Earth, monitoring of the solar disc and corona, and carry out measurements of the interplanetary medium. To achieve these objectives the Vigil mission will carry different types of remote sensing and in-situ instruments: coronagraph, heliospheric imager, magnetograph, magnetometer, and plasma analyzer. The full description of the Vigil mission and provided instruments can be found in the *Vigil Mission Objectives and Payload Description* document (password: "2022VigilNIO!").

NASA SMD plans to solicit Vigil FMO proposals for a Principal Investigator (PI)-led science investigation that includes an EUV imager and

- advances understanding of solar variability manifested as "the sudden release of magnetic energy that enables both flares and coronal mass ejections (CME) to accelerate particles to high energy efficiently"[1];
- enables the development "of advanced methods for forecasting and nowcasting of solar eruptive events and space Weather"[2];
- makes effective use of ESA instrument data in the proposed investigation; and
- supports objectives of the Vigil mission to provide low latency data for operational space weather applications.

Descriptions of the spacecraft interface and total payload resources, including mass, power, and data for the instrument are provided in the ESA Proposer's Information Package (password: "2022VigilNIO!").

Proposals will be solicited for a science investigation requiring the development and operation of the proposed instrument, designated as Class D (as defined in NPR 8705.4A, *Risk Classification for NASA Payloads*) on a platform provided by ESA. The Vigil FMO instrument investigation will be managed under the requirements of NPR 7120.5F, *NASA Space Flight Program and Project Management Requirements*.

While only U.S. organizations are eligible as the sole or lead organization for proposals to the forthcoming AO, participation will be open to all categories of U.S. and non-U.S. organizations,

including educational institutions, industry, not-for-profit organizations, Federally Funded Research and Development Centers (FFRDC's) including the Jet Propulsion Laboratory (JPL), NASA Centers, and other Government agencies. Proposing PIs are permitted and expected to assemble their instrument teams from any and all of these organizations. International participation is allowed, including from ESA member states.

Proposing PIs are responsible for complete research investigations that require a spaceflight mission, including instrument hardware, investigation operations, and data analyses that address the investigation science objectives, as well as quick-look low-latency data that will be defined in the final AO.

Other important aspects of the AO are expected to be:

- The AO will be based on the Standard PI-led Mission AO Template available at http://soma.larc.nasa.gov/standardao/sao_templates.html.
- Submission of a Notice of Intent to Propose, by the deadline given, will be a mandatory prerequisite for submission of a full proposal.
- The AO Cost Cap for proposed investigations will be $37M for Phases A through F, in Fiscal Year (FY23) dollars.
- The sum of contributions of any kind to the entirety of the investigation may not exceed one-half (1/2) of the proposed PI-Managed Mission Cost.
- International contributions are welcome, including from ESA member states.
- If a proposal includes U.S. or non-U.S. contributions that are essential to the success of the proposed investigation or in the critical path, the proposal must include mitigation plans for the failure of the funding or contribution to materialize, including holding encumbered reserves to develop the contribution directly.
- Evaluation and selection will be done using a single-step selection process; no competitive Phase A (Step 2) or down-selection is expected. Normal instrument Phase A activities will be conducted following selection.
- Level 1 science requirements and Level 2 project requirements will be required as part of proposals and will be evaluated for their maturity (commensurate with the pre-Phase A nature of the concepts).
- Proposers responding to the AO will be required to indicate any export-controlled material (subject to provisions under International Traffic in Arms Regulations (ITAR) and Export Administration Regulations (EAR)) in their proposals.
- ESA representatives may participate as Observers (per Science Policy Document SPD-17, *Statement of Policy on Observers at Panel Reviews of Proposals*) in the science and Technical, Management, and Cost (TMC) evaluation panels and may provide comments to NASA; redacted versions of all submitted proposals will be provided to ESA to enable this participation.
- Prior to the selection decision, ESA may perform, with NASA input, an accommodation study of selectable proposals to assess the extent to which the proposed instrument is

compatible with the Vigil spacecraft and other potential payload components and provide the results of that study to NASA.

The AO may contain provisions that differ from this notice, in which case the AO itself will take precedence.

The following draft schedule anticipates the AO's major milestones:

Draft AO Release Date …… approximately 6 weeks after Community Announcement release
Comments on Draft AO Date …… 2 weeks after Draft AO release
AO Release Date …… approximately 12 weeks after Draft AO release
Preproposal Conference (webinar) ..... approximately 3 weeks after AO release
Notice of Intent to Propose (mandatory) Deadline ..... approximately 6 weeks after AO release
Proposal Submittal Deadline ..... no less than 90 days after AO release
Selection Announced (target) ..... approximately 8 months after AO release
Delivery Readiness Date ..... No Later Than Q4 Calendar Year 2027

NASA has not approved the issuance of an AO for Vigil FMO, and this community announcement does not obligate NASA to issue the AO or to solicit proposals. Any costs incurred by prospective investigators in preparing submissions in response to this notification or the planned AO are incurred completely at the submitter's own risk.

Further information, including any Questions and Answers (Q&A), will be posted on the NASA Science Office of Mission Assessments (SOMA) Vigil FMO Acquisition Website at https://lws.larc.nasa.gov/vfmo/. Depending on the question's nature, NASA may respond on an individual basis by email or may post Q&As of broad interest or general clarification. Posted Q&As will be edited to preserve the submitter's anonymity.

Please address questions or comments only via email including "Vigil FMO" in the subject line to the Point of Contact, Dr. James Spann, Space Weather Lead, Heliophysics Division, Science Mission Directorate, Mary W. Jackson NASA Headquarters Building, Washington, DC 20546-0001, at jim.spann@nasa.gov ."

[1] National Research Council 2013. Solar and Space Physics: A Science for a Technological Society. Washington, DC: The National Academies Press. https://doi.org/10.17226/13060, page 286.

[2] National Research Council 2013. Solar and Space Physics: A Science for a Technological Society. Washington, DC: The National Academies Press. https://doi.org/10.17226/13060, page 288.