

Partnership Opportunity Document (POD)
for
NASA's Goddard Space Flight Center (NASA's GSFC)
Earth Venture Instrument (EVI-6) Concepts
CubeSat Partner

March 30, 2021

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1.0 GENERAL INFORMATION

Contracting Office Address

NASA's Goddard Space Flight Center
Code 210.Y
Greenbelt, MD 20771

2.0 INTRODUCTION / SCOPE

This opportunity is in preparation for the Earth Venture Instrument 6 (EVI-6) opportunity within the Earth System Science Pathfinder (ESSP) Program, which is estimated to be released in Q3-Q4 of FY21. The partnership opportunity is being issued to select a teaming partner(s) to provide multiple spacecraft buses capable of support mission needs for up to 2 years in low earth orbit, instrument to spacecraft integration support, delivery to launch integration site, and mission operations support for launch, early orbit commissioning, and nominal operations.

The proposed instrument is currently in pre-Phase A. This phase ends with a single step proposal that is expected to be due 3 months after the AO is released. If the proposal is selected for implementation, the mission will proceed into Phase A, per NPR 7120.5E. The team must receive Center approval for authorization to develop a formal proposal. The concept will be reviewed for approval to proceed prior to AO release based on its merits including technical maturity and viability within the cost cap as well as likelihood of selection. The following schedule should be used as a basis for responses to this opportunity:

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|--|--------------------------|
| Partnership Opportunity Document released | March 30, 2021 |
| Responses due | April 16, 2021 |
| Q&A Teleconferences (if needed) | begin April 20, 2021 |
| Partner Selection announced | April 30, 2021 |
| GSFC Strategy Review and Design Review | Prior to AO Release |
| EVI-6 AO Release Date | Expected ~ June 2021 |
| Single Step Proposal in response to EVI-6 AO | Expected ~ Sept-Oct 2021 |
| Authority to Proceed (ATP) | Expected ~ June 2022 |
| Instrument Delivery | ATP + 32 months |
| Launch Readiness | ATP + 48 months |

The mission cost cap for this AO is expected to be in the neighborhood of \$35M (FY22)/ Class D Cubesat Mission. There will be no exchange of funds between the teaming partners for the portion of this partnership opportunity dealing with the preparation of the initial submission (Pre-Phase-A, Step 1 proposal) to the EVI-6 AO. Funding will be available for subsequent phases should the candidate mission concept be competitively selected for those additional phases.

3.0 OPPORTUNITY OVERVIEW

The National Aeronautics and Space Administration (NASA) Science Mission Directorate (SMD) Earth Science Division's Earth Venture portfolio is an element within the Earth System Science Pathfinder (ESSP) Program. Earth Venture investigations consist of a series of regularly solicited, competitively selected, cost- and schedule-constrained Earth science investigations. They are described in the 2017 report, *Thriving on Our Changing Planet*. The 2017 Decadal Survey

recommended that the existing Earth Venture portfolio be continued and expanded over the coming decade.

Initiated in 2007, the goal of NASA's Earth Venture portfolio is to provide frequent flight opportunities for high quality, high value, and focused Earth science investigations. These investigations need to be accomplished under a not-to-exceed cost cap that can be developed and flown relatively quickly, generally within five years. The investigations are Principal Investigator (PI) led and are selected through an open competition to ensure broad community involvement and encourage innovative approaches.

The programmatic objectives of the Earth Venture portfolio are to implement investigations that will:

- Advance scientific knowledge of Earth science processes and systems;
- Add scientific data and other knowledge-based products to data archives for all to access;
- Result in scientific progress and results published in the peer-reviewed literature to encourage, to the maximum extent possible, the fullest commercial use of the knowledge gained;
- Develop information products, demonstrate relevant applications, and provide data to key applications communities to enhance the overall benefits of a mission;
- Provide opportunities to expand the pool of well-qualified Principal Investigators and Project Managers for implementation of future NASA missions;
- Implement technology advancements that have been accomplished through related programs; and
- Communicate scientific progress and results through popular media, scholastic curricula, and outreach materials that can be used to inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.

4.0 STATEMENT OF WORK

It is expected that the selected POD respondent will provide support using their own resources to help develop the proposal in response to the EVI-6 AO by providing the elements required for multiple cubesat buses, associated payload to satellite Integration & Test (I&T), delivery to launch integration site, and mission operations support for launch, early orbit commissioning, and nominal operations. This support includes:

- Subsystem level narrative description of cubesat design and key parameter tables, articulating the capabilities and advantages of this platform/company
- Description of I&T processes and facilities
- Description of mission operations facilities including ground station network
- CAD drawings and block diagram
- Master Equipment List (MEL)
- Heritage narrative and photographs
- Development, integration and delivery schedule and cost
- Substantiation of flight heritage, reliability, and cost estimate
- Adherence to mission and payload accommodation requirements as well as NASA standards

This will involve meeting with the Principal Investigator (PI) and other proposal team members to establish the system architecture, to help define both end-to-end and elemental performance requirements, to provide well-defined interfaces for the instruments, launch vehicle and ground system elements, to identify and plan the schedule and phased cost, and to identify any necessary technology developments and/or other risk areas that may affect mission success. These efforts will culminate in a Technical Baseline Review (TBR) approximately 30 days after selection and will include cost estimation for all partner-provided mission elements and for all mission phases.

The period of performance for concept formulation and proposal development is expected to start upon selection and last until proposal submission.

If the proposal is selected for development and launch, the respondent will be responsible for providing the platform, including participation in design, development, testing, mission I&T, and mission operations. Launch of the cubesat system will be the responsibility of NASA's CSLI.

5.0 POD RESPONSE INSTRUCTIONS

Potential respondents are asked to contact the NASA'S GSFC EVI-6 team with a **Notice of Interest** (intentionally not called a notice of intent) to receive additional detail. This Notice of Interest does not create an obligation to respond to the POD, but allows NASA'S GSFC EVI-6 team to disseminate additional details on the mission parameters and requirements and to provide answers to questions from potential partners. **All Notice of Interest respondents will receive a document containing additional details regarding the payload requirements, which can be used to facilitate a focused response to the partnership opportunity.** These details are proprietary and competition sensitive and are not to be shared outside the teams necessary to prepare a full response.

After receipt of the mission document, respondents may send questions to the NASA'S GSFC EVI-6 Team at the e-mail address listed below. Questions and answers will be made available to all those who respond to the Notice of Interest. The source of the questions shall be held confidential. Questions and answers that contain information unique to a respondent's proprietary approach will not be shared if they are identified as such.

Notice of Interest shall be sent to Julia.W.Breed@nasa.gov with cc to Yolanda.A.Williams@nasa.gov via email with "Notice of Interest" in the subject line, a simple sentence of two expressing interest, and an email address to send further information.

For purposes of this partnership opportunity, the NASA'S GSFC EVI-6 Team contact is Julia Breed, Julia.W.Breed@nasa.gov, with cc to Yolanda.A.Williams@nasa.gov.

It is the responsibility of potential respondents to monitor beta.SAM.gov for information concerning this POD.

Responses to the Partnership Opportunity Document (POD) shall:

- Address all requirements noted in Sections 2.0 through 6.0 of this document.
- Deliver the requested information in a standard slide format (viewgraphs: such as Power Point) that shall not exceed 20 pages. The font size for the text shall be readable. Backup slides are permitted.

Responses will be treated as proprietary information and controlled as such by GSFC for the US Government.

Proposal slide packages (electronic copy only, Portable Document Format {PDF} recommended) must be received by 4 pm EDT, 16 April 2021.

Proposal slide packages are to be delivered to Julia Breed, Julia.W.Breed@nasa.gov with cc to Yolanda.A.Williams@nasa.gov at the listed email addresses. You should expect to receive a reply email, confirming receipt of your proposal. If clarifications are needed, NASA/GSFC will set up teleconferences with each respondent for questions and answers. The timeline of these teleconferences, if needed, is expected to begin on **20 April 2021**.

6.0 PROPOSAL CONTENT & EVALUATION CRITERIA

The respondent shall:

- 1) Demonstrate understanding and flight experience in the design, fabrication, integration and testing of spacecraft:
 - Identify assumed mission and system requirements for the spacecraft and a response to addressing those requirements
 - Highlight particularly critical or challenging areas for the design of the spacecraft
 - Provide a technical summary/description of the proposed spacecraft bus including relevant heritage
 - Describe what types of capabilities and cost benefits the spacecraft provides for the intended mission
 - Identify available design and modeling capabilities required to support development of the spacecraft
 - Identify fabrication and testing facilities that will be required to support development and test of the spacecraft
 - Provide any recommended potential study topics related to the spacecraft
- 2) Discuss the advantages offered by your company, including what level of resources would be allocated to the proposal phase of support, including:
 - skills that will be provided, ideas on what level of conceptual design and important analysis and trade studies that might be needed
 - any other unique company advantages offered that would benefit the selection and success of this effort.
- 3) Identify the pertinent missions for which the respondent has provided support for proposal writing in the area of spacecraft design, fabrication, integration and testing:
 - Provide data on scope of the spacecraft design, the role played in the proposal process, and the portions of the proposal written or provided assistance in writing, and provide a customer reference POC
- 4) Provide a Rough Order of Magnitude (ROM) cost estimate and schedule for the design, fabrication, and testing of the spacecraft; integration of the GFE instrument module to the spacecraft; observatory environmental testing, and mission operations support including ground network access for data downlink and delivery to customer. While these ROM's will not be considered binding commitments, they will serve as an important consideration during the response evaluation and therefore some supporting justification of the ROM is required. Include previous experiences in the applicable area as well as cost/schedule performance with supporting data (estimated vs actual).

The evaluation team will use the following factors in selection and award:

1. Technical Approach (30%). Respondents will be evaluated on their demonstrated understanding of the requirements and proposed approach and ability to meet those requirements.
2. Cost (45%). Respondents will be evaluated on their overall cost and on the reasonableness of cost and schedule estimates. The mission seeks solutions that are affordable within the EVI-6 Cost Cap of \$35M (FY22)/Class D Cubesat Mission.
3. Relevant Experience and Past Performance (25%). Special emphasis will be given to demonstrated experience with similar missions, particularly with regards to instrument accommodations, spacecraft attitude control requirements, and mission communication requirements

7.0 ACRONYMS

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|-------------|------------------------------------|
| AO | Announcement of Opportunity |
| CSLI | CubeSat Launch Initiative |
| NASA’S GSFC | NASA’s Goddard Space Flight Center |
| EVI-6 | Earth Venture Instrument-6 |
| ICD | Interface Control Document |
| NLT | No Later Than |
| NPR | NASA Procedural Requirement |
| PI | Principal Investigator |
| POD | Partnership Opportunity Document |
| ROM | Rough Order of Magnitude |
| TBD | To Be Determined |
| U.S.A | United States of America |