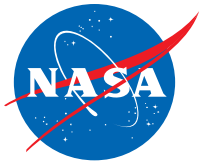

Heliophysics Small Explorers 2016 Announcement of Opportunity and Mission of Opportunity Pre-Proposal Conference

CubeSats, sRLVs & Secondary Payloads

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CubeSats

- Partner Missions of Opportunity (PMO) and Small Complete Missions (SCMs) may be proposed for flight on CubeSats.
- CubeSat Investigations must encompass the provision of CubeSats (instrument and flight systems) ready for integration to the launch vehicle (Phases A-D), the technical support for integration onto a NASA-determined launch vehicle, the on-orbit operations, and the delivery of science quality data (Phase E).
- The PI-Managed Mission Cost Cap for an Heliophysics Explorers Mission of Opportunity (CubeSats), including all mission phases and the cost of accommodation on and/or delivery to the host mission, if applicable, is $55 million in Fiscal Year (FY) 2017 dollars.
- For SCMs, proposers must specify the launch readiness date in the proposal, which is to be no later than August 2022. For PMOs, the launch date itself is not constrained. PI must provide evidence that the sponsoring organization intends to fund the primary host mission and that the NASA commitment for U.S. participation is required by the sponsoring organization prior to March 2020.
- NASA may need to adjust the launch date from that proposed; The degree of launch date flexibility must be indicated in the proposal.

CubeSats

- NASA provides launch and deployment services for missions on CubeSats that utilize the CubeSat Launch Initiative (CSLI) at no cost to the PI-managed Mission Cost.
- The CubeSat Launch Initiative is managed by the NASA Human Exploration and Operations Mission Directorate. See http://www.nasa.gov/directorates/heo/home/CubeSats_initiative.html
- NASA also plans to provide launch services for CubeSats as primary launches (for no more than a total of 50kg, inclusive of deployment hardware). There will be a $20M charge to the PI-Managed Mission Cost for these launch services.
- For CubeSat proposals that use CSLI, all instruments/small satellites are recommended to comply with Cal Poly CubeSat Design Specifications, found at: http://cubesat.org/resources .
- Concepts that do not comply with the Cal Poly CubeSat and Poly Picosat Orbital Deployer (P-POD) standards should clearly describe how their designs are packaged and deployed.

Cubesats

- NASA Launch Services Program has issued a *Program Level Dispenser and CubeSat Requirements Document* with requirements for CubeSats sized up to 6U (2U x 3U). Both of these documents can be found in the Program Library.
- All proposals for CubeSats sized up to 6U shall be compliant with these requirements. No CubeSat form factors larger than 6U will be considered under the present call. Qualifying CubeSat form factors (size) include 1U, 1.5U, 2U, 3U and 6U. The mass limitation is dependent on the launch and dispenser used.
- The mass limitation is dependent on the launch and dispenser used. The 1.33 kg/U is the most constraining limit and good for any scenario. However, for CubeSats on a Venture Class Launch Services mission or other government launch, CSLI is accepting CubeSat masses that exceed the 1.33 Kg/U limit. For a 6U CubeSat, 12kg is good limit to use that will satisfy any dispenser on CSLI contract.

CubeSats

For further information on CubeSats, please contact:

Anne E. Sweet
Launch Services Program Executive
Phone: 202-358-3784
E-mail: anne.sweet-1@nasa.gov

or

Jason C Crusan
Director, Advanced Exploration Systems
Phone: 202-358-0635
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sRLVs

- SCMs may be proposed for flight on suborbital Reusable Launch Vehicles (sRLVs).
- The proposed PI-Managed Mission Cost for missions on sRLVs shall be no more than $35 million in FY 2017 dollars.
- Proposers must specify the launch readiness date in the proposal, which is to be no later than August 2022. The degree of launch date flexibility must be indicated in the proposal.
- Access to sRLV platforms is managed by the Flight Opportunities Program within the Space Technology Mission Directorate. Platforms are provided by NASA to host payloads on sRLVs at no cost to the PI-managed Mission Cost.
- Information about sRLVs vehicles, including vehicle capabilities and contact information for some vendors, is available from the Flight Opportunities Program website at http://flightopportunities.nasa.gov.

sRLVs

- Proposals for investigations using sRLVs as platforms must specify the technical requirements that their investigation places on the vehicle.
- SCMs to be flown on sRLVs must either be automated or remotely operated. Remote operation capability must be confirmed with the flight operator.
- The proposal must include a Letter of Endorsement from a commercial vendor that:

  (i) provides technical information on how the vehicle will meet the investigation requirements,

  (ii) states that the vehicle will be available for use at the time proposed for flight and provides information showing a plan for getting from the current vehicle status to flight status, and

  (iii) provides a quoted cost for the flight and all other services that are required from the vehicle vendor to enable and conduct the proposed investigation.

- The Flight Opportunities Program is available to assist with (i) – (iii).

sRLVs

- The Flight Opportunities Program may advise proposers on the use of sRLV platforms, including the potential integration, safety and mission assurance, and operational costs.

- Questions concerning potential sRLV investigations may be addressed to:

Robert Yang
Flight Opportunities
Space Technology Mission Directorate
NASA Headquarters
Washington, DC 20546
Telephone: 202-358-0143
E-mail: robert.l.yang@nasa.gov

Secondary & Hosted Payloads

- This Explorer Mission of Opportunity (MO) permits two Mission of Opportunity types may be proposed in response to this solicitation:
  - Partner Missions of Opportunity (PMOs), includes CubeSats
  - Small Complete Missions (SCMs)
    - SCMs are ISS payloads, commercial hosted payloads, CubeSats or suborbital class (Super Pressure Balloon (SPB), Long Duration Balloon (LDB) or Suborbital Reusable Launch Vehicle (sRLV)) investigations.
- Secondary and hosted payload proposals where the proposer has arranged alternative access to space and where the proposed mission may not be the primary payload for the arranged launch vehicle or for the arranged spacecraft.
- The proposed investigation must be a complete science investigation and the PI must remain in charge of the development, launch, and successful operation of the investigation.
- The PI-Managed Mission Cost Cap for an Heliophysics Explorers Mission of Opportunity, including all mission phases and the cost of accommodation on and/or delivery to the host mission, if applicable, is $55 million in Fiscal Year (FY) 2017 dollars. The PI-Managed Mission Cost Cap is $35 million in FY 2017 dollars for suborbital-class missions.

Secondary & Hosted Payloads

Launch Readiness:

- For SCMs, proposers must specify the launch readiness date in the proposal, which is to be no later than August 2022.
- For PMOs, the proposing PI must provide evidence that the sponsoring organization intends to fund the primary host mission and that the NASA commitment for U.S. participation is required by the sponsoring organization prior to March 2020; the launch date itself is not constrained, but consistent with the documented launch and operations schedule of the primary host mission.
- NASA may need to adjust the launch date from that proposed; the degree of launch date flexibility must be indicated in the proposal.

Secondary & Hosted Payloads

Alternative Access to Space:

- Alternative access to space may include purchased or contributed payload accommodations as a hosted payload (e.g., instrument package) on a U.S.- or foreign-provided spacecraft launching on a U.S.- or foreign-manufactured launch vehicle.
- With the exception of SCMs to the ISS, missions utilizing the CSLI, all proposals of missions launched as secondary or hosted payloads, costs for access to space must be included in the PI-Managed Mission Cost.
- The stability and reliability of the proposed relationship with the host organization will be assessed as a programmatic risk element in the proposal.
- The PI assumes all risk for any delays in the implementation of the parent mission and shall, therefore, propose appropriate reserves for such schedule contingencies. Proposal shall include 9 months funded schedule reserve for this risk.
- Proposals that include non-NASA launch services, the proposal must describe the arrangement between the PI and the non-NASA launch service provider to enable the PI's insight for launch services.
    - The proposal budget must include $2.0M for the NASA launch vehicle monitoring functions and advisory services.

Secondary & Hosted Payloads

Alternative Access to Space (continued):

- The proposal must describe the launch services, demonstrate compatibility with the proposed launch vehicle, and show how the provider will fulfill the mission requirements.

Proposals that include payload accommodation as a hosted payload shall meet the following requirements:

- The proposer must secure the organization(s) that will provide the payload accommodations.
- The proposed investigation must be self-sufficient (with exception of any critical resources provided by the host platform) and the success of the investigation must not depend on the other science payloads accommodated on the host platform.
- The proposal must describe the accommodation, demonstrate compatibility with the proposed spacecraft and show how the host will fulfill the mission requirements.
- The NASA PI is responsible for the entire investigation including mission assurance. The proposal shall describe how mission assurance will be met for those areas that are not under the PI's control.

Secondary & Hosted Payloads

- All proposed PMO investigations must also demonstrate: (1) their formal relationship with the sponsoring agency's host mission and (2) the status of the host mission, including the level of commitment by the sponsoring agency to complete the mission.
- All proposed SCM investigations, with the exception of investigations requiring flight on the ISS or suborbital-class missions, or launch services purchased directly by the investigation, must also provide a Letter of Commitment from the program or agency providing access to space.
- This Letter of Commitment must contain: (1) a detailed description of the proposed provisions for access to space, and (2) the status of those proposed flight provisions within the sponsoring program or agency including the level of commitment that the sponsoring program/agency has made to support that flight opportunity.
- Co-manifested or secondary payload Proposals that include non-NASA launch services (purchased or contributed) obtained from a U.S. or non-U.S. partner shall meet the following requirements:
  - the proposer must demonstrate a commitment from the proposed co-manifested or primary mission organization(s) to accommodate the proposed payload or demonstrate that the launch services provider has an appropriate process to provide specific launch services; these commitments must be documented in a letter from the appropriate organization(s).