National Aeronautics and Space Administration

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UNDERGRADUATE STUDENT INSTRUMENT PROJECT (USIP) - 2015

Student Flight Research Opportunity (SFRO) for Undergraduate Students

Cooperative Agreement Notice (CAN) CFDA: 43.008

NOTICE OF INTENT DEADLINE: **October 1, 2015**
PROPOSALS DUE: **November 20, 2015**

ABSTRACT

The National Aeronautics and Space Administration's (NASA) Science Mission Directorate (SMD), in collaboration with the Office of Education (OE) National Space Grant College and Fellowship Program (Space Grant), is releasing this Undergraduate Student Instrument Project (USIP) Student Flight Research Opportunity (SFRO) to solicit proposals from U.S. institutions of higher education to develop an undergraduate-led Project Team that will fly a science and/or technology payload relevant to NASA strategic goals and objectives on a sounding rocket, balloon, aircraft, suborbital reusable launch vehicle (sRLV), or CubeSat launched on an orbital launch vehicle (hereafter referred to collectively as suborbital-class platforms).

The cost cap for an investigation awarded by OE is $200K, including the design, development, integration, and testing of the payload; student internships; and research on key innovative technologies. OE funding is limited to consortia of the National Space Grant College and Fellowship Program (Space Grant). See Appendix E for proposal conditions and guidelines for Space Grant consortia.

The cost cap for an investigation awarded by SMD is $100K, including the design, development, integration, testing of the payload; and student internships. SMD funding is available to all U.S. institutions of higher education.

Funding by NASA may be supplemented with contributions by the implementing institution (no limit); however, there are no expectations as to the amount of the institutional contribution and such contributions will not be considered in the evaluation of proposals. The selected projects must be launch-ready within 18 months of project initiation. SMD and OE estimate total funding available for award at $6.0M, and expect to select at least 30 projects for implementation, subject to available funding. The launch/flight services are provided by NASA at no cost to the project. Proposals to the USIP 2017 Solar Eclipse solicitation are not eligible for award under USIP-2015.

The two goals of this USIP SFRO are:

- To provide a hands-on flight project experience to enhance the science, technical, leadership, and project skills for the selected undergraduate student team.
- To fly a science and/or technology investigation relevant to NASA strategic goals and objectives on a suborbital-class platform.

The key dates of this solicitation are:

SFRO RELEASE DATE	AUGUST 21, 2015
QUESTION AND ANSWER TELECON	SEPTEMBER 10, 2015 (2:00 PM EDT)
NOTICE OF INTENT DEADLINE	OCTOBER 1, 2015 (11:59 PM EDT)
PROPOSAL SUBMITTAL DEADLINE	NOVEMBER 20, 2015 (11:59 PM EST)
SELECTIONS ANNOUNCED (TARGET)	DECEMBER, 2015
LAUNCH READINESS	AUGUST 1, 2017

UNDERGRADUATE STUDENT INSTRUMENT PROJECT (USIP)
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1.0 Description of Student Flight Research Opportunity

1.1 Introduction

The National Aeronautics and Space Administration (NASA) Science Mission Directorate (SMD), in collaboration with the NASA Office of Education (OE) National Space Grant College and Fellowship Program (Space Grant), is releasing this Undergraduate Student Instrument Project (USIP) Student Flight Research Opportunity (SFRO) for the purpose of providing hands-on flight project experiences for U.S. institutions of higher education.

This USIP SFRO solicits proposals for an undergraduate student team to design, develop, and fly a science and/or technology investigation relevant to NASA strategic goals and objectives on a sounding rocket, balloon, aircraft, suborbital reusable launch vehicle (sRLV), other commercial suborbital vehicle, or CubeSat launched as a secondary payload on an orbital vehicle (hereafter all carriers will be referred to as suborbital-class platforms).

Proposers are encouraged to incorporate this opportunity within their design classes in order to develop future scientists, engineers, and project leaders. All proposals submitted in response to this solicitation must meet the requirements of this solicitation, and they must be implemented by an undergraduate student project team.

The cost cap for an investigation awarded by OE is $200K, including the design, development, integration, and testing of the payload; student internships and stipends; and research on key innovative technologies. OE funding is limited to consortia of the National Space Grant College and Fellowship Program (Space Grant). See Section 2.3.2 and Appendix E for proposal conditions and guidelines for Space Grant consortia.

The cost cap for an investigation awarded by SMD is $100K, including the design, development, integration, testing of the payload; and student internships. SMD funding is available to all U.S. institutions of higher education.

The payload integration with the suborbital-class platform and the launch/flight services are provided by NASA at no cost to the project team. The selected project must be either launched or launch/flight-ready within 18 months from the Project Initiation Conference, with submittal of a final report to SMD/OE within 90 days of the expiration date of the award. SMD and OE estimate total funding available for award under USIP at $6.0M, and expect to select at least 30 projects for implementation, subject to available funding.

Information regarding the preparation and submission of proposals is described in Section 4. Proposals will be evaluated and selected through the process described in Section 5. Space Grant proposers should carefully review Appendix E to ensure compliance with Space Grant Program requirements.

The following appendices are provided to assist USIP proposers:

- Appendix A provides information for each of the suborbital-class platforms offered.
- Appendix B provides example tables and matrices for the USIP proposals.
- Appendix C provides a glossary of terms, abbreviations, and acronyms.
- Appendix D provides a summary table of USIP requirements.
- Appendix E provides information specific to proposers from Space Grant Consortia.

1.2 Major Changes from the Previous USIP Opportunity

Proposers should be aware of the following significant changes in this USIP SFRO from the last opportunity:

- The NASA Office of Education (OE) is a co-sponsor of this USIP cycle; therefore, compliance with the requirements of relevance to OE/Space Grant strategic goals is also required for proposals submitted for OE funding. (These are described in Appendix E)
- OE funding is limited to proposals from consortia of the National Space Grant College and Fellowship Program (Space Grant).

1.3 USIP's Strategy and Objectives

NASA developed USIP in 2012 as part of a long-term strategy to increase hands-on training opportunities for undergraduate students in response to recommendations made by the *2008 NASA Program Definition Team for Student Collaborations (SC) Report*. The SC report highlighted the critical importance of student collaborations to NASA workforce development, and encouraged NASA to "harness the resources and assets of universities around the country" and to provide hands-on opportunities to students using NASA suborbital platforms in order to train its future scientists, engineers, and project managers.

NASA designed USIP to promote interest and proficiency in science, technology, engineering and mathematics (STEM) education and to develop careers in the STEM-related fields through offering its unique research platforms for student flight research opportunities. The objectives of this USIP SFRO are to enable an undergraduate student project team to:

- Increase their technical, project management, and leadership skills;
- Receive mentoring from a faculty Principal Investigator (PI) and graduate students throughout the project;
- Complete a hands-on project, including design through hardware development, integration and test, launch, mission operations, data collection, and analysis of results;
- Experience a complete project lifecycle using NASA suborbital-class platforms for access to space; and,
- Advance new technology and/or produce science results relevant to NASA's strategic goals and objectives.

1.4 USIP's Goals

Hands-on Flight Project Experience: One of the two principle goals of this solicitation is to provide a hands-on flight project experience to enhance the technical, leadership, and project

skills for the selected undergraduate student project team (see Section 3.1 for complete hands-on flight project experience requirements). It is expected that this goal would be accomplished principally by structured mentoring by a faculty PI and graduate students, supported by interaction with NASA, and through lessons learned and knowledge sharing by the team.

Science/Technology Investigation: The other principle goal of this solicitation is to fly a science and/or technology investigation relevant to NASA strategic goals and objectives on a suborbital-class platform (see Section 3.2 for science/technology investigation requirements). NASA's strategic goals and objectives are described in the 2014 NASA Strategic Plan at:

https://www.nasa.gov/sites/default/files/files/FY2014_NASA_SP_508c.pdf

1.5 USIP SFRO General Information

The following schedule describes the major milestones for this USIP SFRO:

USIP-2015 Release Date.....August 21, 2015
Question and Answer (Q&A) Telecon .....September 10, 2015 (2:00 PM EDT)
Notice of Intent (NOI) .....October 1, 2015 (11:59 PM EDT)
Proposal Submittal Deadline.....November 20, 2015 (11:59 PM EST)
Selections Announced (Target).....December, 2015
Project Initiation Conference .....January 12, 2016
Launch Readiness .....August 1, 2017

USIP SFRO release: This SFRO will be released in accordance with the NASA Research announcement policy and guidelines at the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) at http://nspires.nasaprs.com – click on "solicitations" then click on "Open Solicitations," and then select the USIP SFRO announcement.

USIP Point of Contact (POC): If you have any questions concerning this solicitation, please contact:
David Pierce
Senior Program Executive for Suborbital Research
Science Mission Directorate
NASA Headquarters
Phone: (202) 358-3808
E-mail: david.l.pierce@nasa.gov

Space Grant Point of Contact (POC): If you have any questions specifically concerning the Space Grant component of this solicitation, please contact:
Dr. Lenell Allen
Director, Aerospace Research and Career Development (ARCD)
Office of Education
NASA Headquarters
Phone: (202) 358-1762
E-mail: hq-space-grant@mail.nasa.gov

Question and Answer (Q&A) Telecon: A Q&A telecon will be held in accordance with the schedule in Section 1.5. Telecon logistics information will be posted on the NASA NSPIRES website.

The purpose of the Q&A telecon is to provide an overview of this USIP-2015 SFRO solicitation, and to address questions about the proposal process. Questions may be sent prior to the telecon to the USIP-2015 POCs in Section 1.5, and may also be addressed at the telecon. The Space Grant consortia should submit their questions to hq-spacegrant@mail.nasa.gov. Anonymity of the authors of all questions will be preserved. Presentations (if any) made at the telecon, including answers to all submitted questions, will be posted as part of a FAQ section on the NASA NSPIRES website. Additional questions and answers subsequent to the Q&A telecon will be handled similarly. Questions may be submitted until ten calendar days before the proposal submittal deadline given in Section 1.5. Answers will be provided no later than seven calendar days before the proposal submittal deadline.

Notice of Intent to propose: To assist in planning the proposal evaluation process concerning this USIP SFRO, all prospective proposers are required to submit a NOI to propose, for each proposal, before the NOI submittal deadline as specified in Section 1.5. NASA will not accept NOIs after the due date and will not review any proposal submitted for which a NOI was not received. Material in a NOI is deemed confidential and will be used for planning purposes only.

NOIs are to be submitted in a short (1 page) PDF document to the NASA NSPIRES website located at http://nspires.nasaprs.com. Each NOI must provide the following requested information, to the extent that it is known:

(a) Name, address, telephone number, and E-mail address of the designated university PI.
(b) A list of any participating universities and, to the extent known, the student project team leader and project team members.
(c) A brief abstract (250 words or less) summarizing the following:
    (i) the objective(s) of the proposed science and/or technology investigation;
    (iii) the anticipated mission operations, including the launch/flight services to be used.
    (iv) the plans to enhance the technical, leadership, and project skills for the student project team, including mentoring and training.

Proposal Submission Deadline/Instructions: Proposals submitted in response to this USIP SFRO solicitation shall be delivered no later than the associated deadline given in Section 1.5 to either the NSPIRES website located at http://nspires.nasaprs.com or to the U.S. Federal Grants website located at http://grants.gov. Files must be submitted in a single bookmarked and searchable PDF file of less than 20 MB. NSPIRES will notify proposers that their proposals have been received.

Instructions for submitting electronic proposals are located at http://nspires.nasaprs.com – click on "Solicitations," then click on "Open Solicitations," and then select the USIP SFRO announcement. Also refer to "Proposal Submission Instructions" listed under "Other Documents."

Requirement 1. Submittal Due Date: Proposals submitted in response to this solicitation shall be delivered to either the NSPIRES or Grants.gov websites no later than the proposal submittal deadline in Section 1.5. All proposals shall be submitted in electronic format only.

2.0 Policies Applicable to this Student Flight Research Opportunity

2.1 Management Policies

The following policies will impose requirements on selected projects for which planning should be considered and described as part of the proposal.

2.1.1 NASA Flight Program and Project Requirements

Proposals selected in response to this USIP SFRO must be implemented in conformance with NASA project management principles, as defined by NASA Procedural Requirements (NPR) 7120.8, NASA Research and Technology Program Management Requirements, found at:

http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=7120&s=8

The requirement to use NPR 7120.8 is not meant to be a prescriptive approach, but rather to provide a training experience that is consistent with NASA project management principles. These requirements should be appropriately tailored to fit the proposed investigation's size, scope, complexity, and suborbital-class platform used. Project teams are free to propose their own processes, procedures, and methods for managing their investigation as long as they are consistent with the principles of NPR 7120.8.

2.1.2 USIP-2015 SFRO Management Responsibilities

The Associate Administrators for the Science Mission Directorate (AA SMD) and the Office of Education (AA OE) have overall authority for the conduct of the USIP-2015 SFRO activity, and will be the selection officials for all USIP-2015 SFRO projects. After selection, SMD and OE intend to maintain an essential degree of oversight of the selected project(s), and to that end, have designated the Suborbital and Special Orbital Projects Directorate (SSOPD) at the NASA Goddard Space Flight Center (GSFC)/Wallops Flight Facility (WFF) to serve as the principal project management interface with the selected teams throughout the project lifecycle.

2.1.3 Institutional Management Responsibilities

It is the responsibility of each participating institution to provide the necessary resources to support the undergraduate student project team. Institutions should strive to ensure that the makeup of the project team be multidisciplinary and reflect the diversity of the institution. Institutions are responsible for supporting their student project team members by assigning a faculty member to serve as the proposal's PI, and to mentor and oversee the project team. Institutions are also encouraged to assign graduate student mentor(s), who are eligible for mentoring stipends, to ensure active and consistent mentoring of the undergraduate student team

throughout the project lifecycle. The proposal must describe this process and show how the institution will carry out these responsibilities.

For purposes of this USIP-2015 SFRO, the lead institution is defined as the institution where the undergraduate project (or Team Leader for multi-institution projects) is located, and which has the primary responsibility for ensuring the successful completion of the project.

2.1.4 Principal Investigator Responsibilities

A faculty member/advisor is required to serve as the project PI of record for the proposal and has the primary responsibility for providing oversight and guidance to the undergraduate student project team.

2.1.5 Undergraduate Project Team Responsibilities

The undergraduate student project team is responsible for the formulation and implementation of the project. The project team must be multidisciplinary in makeup (e.g., science, engineering, business, humanities, etc.); is responsible for reporting to the assigned NASA/GSFC/WFF mission manager; and for providing insight to NASA through regular monthly telecons, status reports, and involvement in key reviews. The team is responsible for submitting all documentation required for flight, for delivery of the payload to the launch site, and for analysis of any mission data, and for submittal of a final project report (see Appendix B, Table B-5, Outline for USIP Final Report) to SMD/OE.

2.2 Participation Policies

2.2.1 Eligibility to participate in this USIP SFRO

SMD funding is available to all U.S. institutions of higher education (e.g. universities, four-year colleges, community colleges, or other two-year institutions). OE funding is limited to consortia of the National Space Grant College and Fellowship Program (Space Grant). For-profit institutions and commercial entities are not eligible to propose to USIP.

Prospective project teams can be composed only of undergraduate students from U.S. institutions of higher education. Students must be currently enrolled (part-time or full-time) at the institution. The number of students participating in the investigation is to be determined by the scope of the project, the PI, and the student Team Leader. NASA has no set expectations as to the team size. NASA Centers, including the Jet Propulsion Laboratory, cannot be project team members under this solicitation, but can serve as unfunded mentors to the project team.

Graduate students are not eligible to be project team members; however, they are encouraged to serve as mentors to the undergraduate student team, and are permitted to request a mentoring stipend. Institutions of all experience levels are expected to be able to equally compete for this opportunity through partnering. NASA encourages institutions to partner and shall consider this favorably during the evaluation and selection process.

2.2.2 Technical Constraints on Proposals

Only those proposals that do not exceed the constraints identified in this USIP SFRO and that demonstrate sufficient margins, reserves, and resiliency to ensure mission success within committed cost and schedule will be considered for selection.

2.2.3 Number of Allowable Proposals

Each institution is allowed to submit one proposal composed solely of students from that institution. One additional proposal will be allowed if the second proposal is composed of a team that has participation from multiple institutions (at least one additional institution). Thus, an institution may only *submit* two proposals as the lead institution (if one involves another institution). There is no limit on the number of proposals in which an institution may otherwise participate.

Note: Proposals in response to the USIP Space Grant 2017 Solar Eclipse (SE) (USIP-SE) solicitation are not eligible for award under this USIP-2015 SFRO**.**

See Appendix E for proposal conditions and guidelines for Space Grant consortia.

2.3 Cost Policies

The proposed investigation's budget shall be provided in a cost table format similar to the Total Project Funding Profile Template shown in Appendix B, Table B-3, for the entire project lifecycle, and described according to the project's Work Breakdown Structure (WBS) at a level of detail commensurate with the scope of the investigation. The NSPIRES based budget format will not be used.

This USIP SFRO does not limit Facilities and Administrative (Indirect) costs. However, this USIP SFRO is intended to focus on providing benefit to the undergraduate students. As such, indirect charges which are waived by the institution in support of the student project may be included as part of the Institutional Contribution (section 2.3.3).

In addition to providing funding for the investigation, NASA will also provide payload integration with the suborbital-class platform and launch/flight services as Government furnished equipment (GFE) and at no-cost to the project team. The suborbital-class platform cost should not be included in the submitted budget table.

SMD and OE are not holding any reserves to accommodate cost overruns incurred by a particular investigation, including schedule slips or launch delays. Therefore, failure to achieve the proposed goals within the proposed time and budget could require either descoping the proposed project, delaying it, canceling a particular launch opportunity, or canceling the investigation altogether.

It is anticipated that all of the awards resulting from this solicitation will be cooperative agreements.

2.3.1 Total Project Cost

The *Total Project Cost* is defined as the *Requested Funding* plus any *Institutional Contributions*.

2.3.2 Requested Funding

Requested Funding is defined as the funding that NASA is expected to provide for the selected project team for the formulation and implementation of the proposed project.

Cost Cap for OE Selections: The *Requested Funding* in Real Year dollars (RY$) for a USIP investigation awarded by OE is $200K, including direct and indirect costs, irrespective of the suborbital-class platform proposed, and including the design, development, integration, and testing of the payload; staff labor and student internships/stipends; and research on key innovative technologies. OE funding is limited to consortia of the National Space Grant College and Fellowship Program (Space Grant). See Appendix E for additional guidelines and requirements regarding Space Grant proposals.

Cost Cap for SMD Selections: The *Requested Funding* in Real Year dollars (RY$) for a USIP investigation awarded by SMD is up to $100K, including direct and indirect costs, and is dependent upon the suborbital-class platform proposed, and including the design, development, integration, and testing of the payload; staff labor and student internships/stipends. SMD funding is available to all U.S. institutions of higher education. The cost cap associated with a proposed suborbital-class platform borne investigation to SMD is:

- Sounding Rocket $50K
- Scientific Balloon (Large) $50K
- Hand-Launched Balloon (Small) $50K
- Aircraft $50K
- CubeSat $100K

Examples of *Direct Costs* to be included in the Total Project Cost are: instrument components, payload development, labor, student internships and stipends, support equipment, software, testing facilities, operations, shipping and any project-related travel.

Examples of *Indirect Costs* to be included in the Total Project Cost are Facilities and Administrative costs.

2.3.3 Institutional Contributions

Institutional Contributions to the proposed project effort of funds, labor, facilities, spare or residual hardware, waiver of indirect costs, etc., are acceptable and unlimited. There are no expectations as to the amount of the institutional contribution, and such contributions will not be

considered in the evaluation of proposals. The non-Federal contribution is determined solely by the proposing institution, and based on the institution's capabilities and the project's needs.

These contributions may be applied to any Work Breakdown Structure (WBS) or work element of the proposed project; however, these contributions must be specifically identified and included in the total project cost (see Appendix B, Cost Table B-3). Also, see 2 CFR 200.306; 2 CFR 1800.306 and the Grants and Cooperative Agreement Manual at:

https://prod.nais.nasa.gov/pub/pub_library/srba/index.html

2.4 Data Analysis and Final Report

Project Teams will be responsible for analysis of the investigation data necessary to complete the proposed science/technology investigation, for making presentations at an appropriate professional meeting/conference, and for publication, as appropriate.

Project teams are required to submit a final USIP project report to SMD/OE, including preliminary data analysis, within 90 days after the expiration date of the award. The outline of the USIP final report is provided in Appendix B, Table B-5. Further, the project team will be requested to present a summary of the project, the team, and results and lessons learned at a SMD/OE USIP project review after the project is completed.

3.0 Requirements and Constraints

This section provides general training, investigation, and proposal submittal requirements and constraints. Supplemental requirements on standard proposal content and format are provided in Section 4.1.

3.1 Hands-on Flight Project Experience Requirements

One of the principle goals of this USIP-2015 SFRO is to provide a multidisciplinary undergraduate student team with a hands-on project experience to enhance their science, technical, leadership, and project skills. It is intended that the training and mentoring of the student team will be primarily guided by a faculty PI, assisted by graduate student(s), and that the USIP project will complement and be integrated into the institution's ongoing capstone/design classes or other similar training course for undergraduate students. Further, NASA will support the team through interaction at meetings, reviews, and consultation, as requested.

Mentoring: It is a requirement of USIP for a faculty PI to mentor the project team members. Note that active mentoring of the student team members is considered a critical element of the USIP, and proposers must demonstrate a commitment to mentoring the project team. A description of mentoring plans is expected to be included as part of the proposal.

Proposals shall include a team definition section (see Section 4.1, Table 1, section C) which addresses the following training requirements of the solicitation, including:

Requirement 2. Project Team Definition: Proposals shall identify the multidisciplinary student team members by name, specifying their class year, field of study, and describing their role(s). The proposal shall identify the project Team Leader, the faculty PI, and any assigned graduate student mentors.
Note: NASA recognizes that turn-over of student team members will occur over the course of the investigation.
Requirement 3. Training/Mentoring Plan: Proposals shall describe plans to train and mentor the project team, including any technical, project management, and leadership training to be utilized. Proposals shall describe any academic courses to be used as part of the project's training, and show relevancy toward the project's goals.
Requirement 4. Resumes: Proposals shall include resumes for the student team members, the PI, key faculty staff, and/or graduate student mentors in the appendix section of the proposal.

3.2 Science/Technology Requirements

The other principle goal of this solicitation is to fly a science and/or technology investigation (payload) relevant to NASA strategic goals and objectives on a suborbital-class platform, as identified in the 2014 NASA Strategic Plan.

This goal can be accomplished either (i) by providing useful science data in support of NASA science goals or (ii) by advancing the development of technology or capabilities in support of NASA technology or exploration goals, e.g., by demonstrating a proof of concept, or enabling technology readiness level (TRL) advancement of technologies, or for advancing the readiness of selected exploration or space-related technology systems.

In the context of this solicitation, the term "payload" refers to the essential experiment being carried aboard the suborbital-class platform or orbital launch vehicle. Proposers have the responsibility to describe the investigation goals, the payload requirements, flight mission requirements, and expected results.

Science/technology investigation and implementation: Proposals shall provide a payload that is relevant to NASA strategic goals and objectives. Proposals shall include a Science/Technology Investigation and Implementation section (see Section 4.1, Table 1, section D) that addresses the science/technology investigation goals and requirements of this solicitation, including the following:

Requirement 5: Science/Technology Investigation: Proposals shall describe the goals of the science/technology investigation, its relevancy to NASA strategic goals; describe the investigation, the measurements or data to be obtained, and the anticipated results. The response to this requirement should include an appropriate science and/or technology traceability matrix (see Appendix B, Table B-1, example science/technology traceability matrix), which may be included in the proposal appendix.
Requirement 6: Payload Development: Proposals shall describe the complete payload concept, including all of its major subsystems; the approach toward developing it, including plans for purchasing, building, and testing the payload.

Requirement 7: Mission Traceability: Proposals shall describe the complete flight system concept, including the investigation design requirements, suborbital-class platform requirements, and operations requirements. The response to this requirement should include an appropriate mission traceability matrix (see Appendix B, Table B-2, example mission traceability matrix), which may be included in the proposal appendix.

3.3 Technical Requirements

Proposals shall include a Mission Implementation Section that addresses the technical requirements of USIP-2015, including the following:

Requirement 8. Payload Interface: Proposals shall describe the payload's required support from the suborbital-class platform, including electrical/mechanical interfaces (i.e., power, data, pointing, etc.), and associated fabrication and vehicle integration services. Proposals shall describe plans for integrating and testing the payload with the platform/launch vehicle.

3.4 Suborbital-Class Platforms

Information on each suborbital-class platform provided as Government furnished equipment (no cost) by NASA is shown in Appendix A. Proposers should contact the referenced suborbital-class platform point of contact when developing their proposals to best understand the capabilities of each platform, their associated technical and integration services, how to schedule a flight/launch, and to ensure their proposed investigations are feasible from a vehicle perspective. Appendix A details the following NASA GFE launch/flight services:

- Balloon services should be arranged through the NASA Balloon Program Office (BPO).
- Aircraft services should be arranged through the NASA Airborne Science Project (ASP).
- Sounding rockets services should be arranged through the NASA Sounding Rocket Program Office (SRPO).
- CubeSats should be manifested through the CubeSat Launch initiative (CSLI) within the Human Exploration and Operations Mission Directorate (HEOMD).
- Suborbital reusable launch vehicle (sRLV) services should be arranged through the Space Technology Mission Directorate (STMD)'s Flight Opportunities Program (FOP).

Requirement 9. Suborbital Platform/Concept of Operations (CONOPS): Proposals shall describe the concept of mission operations for the investigation, (e.g., the anticipated launch location, flight plan, and mission duration) including a discussion of the suborbital-class platform within the Mission Implementation Section (see Section 4.1, Table 1, section E).

3.5 Schedule, Reporting, and Reviews

Selected projects must be either launched or launch/flight-ready within 18 months from the Project Initiation Conference (PIC). Once the payload is launch/flight-ready, it will be launched/flown on a schedule determined by the suborbital-class platform provider. The proposer is expected to provide a detailed schedule that demonstrates an understanding of the project tasks required, the critical milestones and the critical path, estimates of schedule reserve,

and appropriate reviews necessary to be launched or launch/flight-ready not later than 18 months from the PIC date.

There are four reviews that are mandatory during the project life cycle, including: the Concept Review (CR), the Preliminary Design Review (PDR), the Critical Design Review (CDR), and the Mission Readiness Review (MRR). NASA will provide draft agendas of each review at the Project Initiation Conference. After selection, the GSFC/WFF SSOPD Mission Manager and the selected projects will work together to agree upon the terms for the monthly status teleconferences/reports, and project reviews.

Per 2 CFR 1800.902, USIP Project teams are required to submit an electronic (PDF) annual progress report to the NASA Shared Services Center.

Requirement 10: Schedule: Proposals submitted in response to this SFRO shall include an appropriately defined schedule, including a narrative of key technical activities and identifying critical milestones, and shall summarize the project's entire life cycle. A schedule foldout is permitted (see Section 4.1, Table 1, section F).

3.6 Management Requirements

The undergraduate student Team Leader (TL) oversees the technical and programmatic (management, cost, and schedule) implementation of the project within committed cost and schedule. The TL coordinates with the faculty PI and leads the student team in order to ensure that the project meets its objectives within the resources outlined in the proposal.

Proposals shall include a management section (see Section 4.1, Table 1, section G) that addresses the management requirements of this solicitation, including the following:

Requirement 11: Management: Proposals shall describe the project's proposed management approach, defined student roles and responsibilities, the decision-making process, and any multi-institution teaming arrangement (if one exists).

3.7 Risk Management

Proposers should demonstrate an understanding of the potential top three implementation risks inherent in development of the proposed investigation (disregard inherent and programmatic risks beyond the team's control), as well as approaches toward mitigating those risks. For USIP-2015, guidance on risk definition can be found in Appendix B, Table B-6.

Requirement 12. Risk Management: The proposal shall discuss the top three project implementation risks, and discuss the approaches to mitigate those risks.

3.8 Cost Requirements

Cost policies, including the definitions of Requested Funding, Institutional Contributions, and Total Project Cost are given in Section 2.3. Proposers have the responsibility to provide a WBS-related grassroots cost estimate. Proposal budgets are to include, within the total project cost, all

costs that will be paid out of the project budget, including all institutional and other contributions. The total project cost should not include the cost of the integration and launch/flight of the suborbital-class platform.

Requirement 13. Total Project Cost: Proposals shall include the proposed total project cost to complete the entire investigation (including requested funding and institutional contributions) in the required cost table (see Appendix B, Table B-3).

Requirement 14. Reserves: Proposals shall identify any margins in technical performance and schedule reserve necessary to complete the project (see Appendix B, Table B-4). Note: Per 2 CFR 200.433, contingencies (reserves of funds) are unallowable.

3.9 Contributions and Letters of Commitment

Contributions from sources other than the funds provided by NASA for this USIP SFRO are welcome. These may include, but are not limited to, labor, services, and/or contributions to the payload, including the use of existing hardware. For these contributions, there must be accompanying Letters of Commitment signed by an institutional official from each organization offering contributions of funds, goods, and/or services.

The required elements in an institutional Letter of Commitment for a contribution are: (i) a precise description of what is being contributed; (ii) the source of the contribution; (iii) a statement that the organization intends to provide the contribution or required funding for the project if it is selected; and (iv) a signature by an official authorized to commit the resource of the organization for participation in the payload.

Requirement 15. Letters of Commitment: If a proposal includes contributions from academic institutions or other entities, the proposal shall identify the contributions, the source of the contributions, and contain the appropriate Letters of Commitment from the contributing organization. Any associated costs for the contributions shall be clearly identified in the budget and counted toward the Total Project Cost.

3.10 Space Grant-Specific Requirements for Innovation Technology Research

Requirement 16. Space Grant Proposals ONLY: For proposers from affiliate institutions of consortia of the National Space Grant College and Fellowship Program (Space Grant), an additional proposal requirement must be addressed, related to Innovation Technology Research, including: 1) Identification and discussion of key innovative technologies, 2) Identification of relevant patented NASA technologies, and 3) Discussion of relevant commercial applications (see Appendix E for details associated with this requirement).

4.0 Proposal Preparation and Submission Requirements

4.1 Structure of the Proposal

A uniform proposal format is required from all proposers to aid in proposal evaluation. The required proposal format and content is outlined below:

(a) A proposal shall consist of a single PDF file with readily identifiable sections (bookmarked) that correspond and conform to Sections A through I, as shown in the Page Limit Table below (Table 1). It shall be typewritten in English, and it shall employ metric (SI) and/or standard astronomical units, as applicable. Proposals for aircraft will use English measures regarding sensor integration. It 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, or additional material that is required for evaluation of the proposal is prohibited.

(b) Page size shall be American standard 8.5 x 11 inches. Text shall not exceed 55 lines per page. Margins at the top, both sides, and bottom of each page shall be no less than 1 inch. Single-column or double-column formats are acceptable for text pages. Type fonts for text and figure captions shall be no smaller than 12-point (i.e., no more than 15 characters per inch; six characters per centimeter). There is no minimum requirement for fonts used within figures and tables, but all text in figures and tables shall be legible; fonts smaller than 8-point are often illegible.

(c) Proposals shall conform to a limit of 20 pages, excluding table of contents, schedule foldout(s), cost tables, and appendices. The following page limit table provides guidance as to the suggested (but not required) length of the individual sections.

TABLE 1: PAGE LIMITS

Section	Page Limits
A. Cover Page and Abstract Combined Title, Key Positions, Total Project Cost, Abstract	As From NSPIRES
B. Table of Contents	No page limit
C. Team Definition - Training, Team Personnel, Roles and Responsibilities, Training D. Science/Technology Investigation and Implementation	6 5
E. Mission Implementation F. Schedule Narrative, and Schedule Foldout(s) G. Management	3 2 No page limit 2
H. Cost Estimate Cost Tables (see Appendix B, Tables B-3)	2 No page limit

I. Appendices: (no others permitted)	No page limit unless noted but brevity is encouraged.
• Letter(s) of Commitment	No limit
• Resumes	1 page / resume
• List of Abbreviations and Acronyms	No limit
• References	No limit
• For Space Grant proposals only: o Student internships, stipends, and consortium collaboration activities	2
o Innovation Technology Research	2

(d) A project schedule covering all phases of the investigation shall be provided on a foldout page(s). This foldout will not be counted against the 20 page limit. The schedule format shall indicate the month and year of each milestone, have a corresponding table of dates, and follow a WBS similar to that shown in Appendix B, Cost Table B-3, but adapted to the carrier being used, allowing WBS, schedule, and cost to flow in a traceable manner. The schedule narrative should complement the schedule foldout, and is included in the page count for this section. The Schedule Foldout should identify, at a minimum, the following major schedule elements:

1. Subsystems design, procurement, development, testing and delivery;
2. Instrument design, development, instrument-level integration and test, leading to a completed instrument payload delivery;
3. Major Deliverables (e.g., ICDs, models, flight modules, data packages, etc.);
4. The four mandatory major reviews (see Section 3.5);
5. Payload integration and testing; integration with suborbital/orbital vehicle; launch readiness date; and
6. Schedule critical path identification, with estimates of schedule reserve.

5.0 Proposal Evaluation, Selection, and Implementation

5.1 Overview of the Proposal Evaluation and Selection Process

5.1.1 Evaluation Process

Proposals will be evaluated by an internal NASA review panel, augmented as necessary by external reviewers, all of whom are Subject Matter Experts (SMEs). Proposals will be evaluated according to the evaluation criteria set forth in Section 5.2 of this USIP SFRO. Panel members will be instructed to evaluate every proposal independently without comparison to other proposals. This panel may be augmented through the solicitation of mail-in reviews, which the panel has the right to accept in whole or in part, or to reject.

Proposals will be evaluated against the standard of providing the appropriate training experience for the undergraduate student team members, while being able to successfully execute the proposed investigation.

The suborbital-class platform and its associated integration services proposed to be used by the project is neither an evaluation factor nor a selection criterion. However, the probability of payload success (Factor B-3) and the risk of flying the payload on the selected suborbital-class platform (Factor C-4) will be evaluated.

5.1.2 Categorization Process

All compliant USIP SFRO proposal evaluations will be reviewed by a single-panel Categorization Committee. The role of the Categorization Committee is to review the evaluation panel results, and categorize each proposed investigations into one of three categories. The three categories are summarized as follows:

Category I - Well conceived and scientifically and technically sound investigations, recommended for selection.

Category II - Well conceived and scientifically or technically sound investigations, but recommended at a lower priority than Category I.

Category III – (*Not Applicable under USIP*) Scientifically or technically sound investigations which require further development and may be reconsidered at a later time for the same or other opportunities.

Category IV - All other proposals not recommended for selection for whatever reason.

5.1.3 Selection Process

After the evaluation process is completed, the final evaluation results, proposal categories and recommendations will be presented to the AA SMD and AA OE, or their designees, who will act as Selection Officials and make the final selections. The SMD and OE Selection Officials may consult with senior members of SMD, OE and NASA concerning the selection. The Selection Officials may also take into account a wide range of programmatic factors, including, but not limited to, the training needs of the university, geographic representation, as well as other programmatic constraints. All selections are final and may not be appealed.

5.2 Evaluation Criteria

5.2.1 Overview of Evaluation Criteria

The general evaluation criteria below will be used to evaluate the proposals, applied to both the training objective and the science/technology objective. Specific factors to be applied to each of the two objectives, as well as feasibility, are defined in more detail in sections 5.2.2, 5.2.3, and 5.2.4. For selection, the evaluation criteria are as follows:

- The merit of the proposed project for student training;
- The science/technology merit and implementation feasibility of the investigation; and
- The feasibility of the proposed approach for mission implementation, including suborbital carrier compatibility.

Evaluation findings for each evaluation criterion will be documented with narrative text in the form of specific major and minor strengths and weaknesses, as well as an adjectival summary score. The adjectival summary scores for the first two criteria (merit of the student training and scientific/technology merit and feasibility) will be reported as Excellent, Very Good, Good, Fair, or Poor, as defined in the table below.

Summary Evaluation	Basis for Summary Evaluation
Excellent	A comprehensive, thorough, and compelling proposal of exceptional merit that fully responds to the objectives of the SFRO as documented by numerous and/or significant strengths and having no major weaknesses.
Very Good	A fully competent proposal of very high merit that fully responds to the objectives of the SFRO, whose strengths fully out balance any weaknesses.
Good	A competent proposal that represents a credible response to the SFRO, having neither significant strengths nor weakness and/or whose strengths and weaknesses essentially balance.
Fair	A proposal that provides a nominal response to the SFRO but whose weaknesses outweigh any perceived strengths.
Poor	A seriously flawed proposal having one or more major weaknesses (*e.g.*, an inadequate or flawed plan of research or lack of focus on the objectives of the SFRO).

The evaluations of student training, and of scientific/technology merit and implementation feasibility, will be supported by identifying strengths and weaknesses of the individual proposals. These will be defined as follows.

- Major Strength: A facet of the response that is judged to be well above expectations and substantially contributes to the scientific/technology merit or personnel training.
- Minor Strength: A strength that substantiates the scientific/technology merit or personnel training.
- Major Weakness: A deficiency or set of deficiencies taken together that are judged to substantially detract from the scientific/technology merit or personnel training.
- Minor Weakness: A weakness that detracts from the scientific/technology merit or personnel training.

The third criterion, mission feasibility, including carrier compatibility, will be reported as Low Risk, Medium Risk, or High Risk, as defined in the table below.

Summary Evaluation	Basis for Summary Evaluation
Low Risk	There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the Proposer's capability to accomplish the investigation well within the available resources.
Medium Risk	Problems have been identified, but are considered within the investigation team's capabilities to correct within available resources with good management and application of effective engineering resources. Mission design may be complex and resources tight.
High Risk	One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.

The mission feasibility evaluations will be supported by identifying the strengths and weaknesses of the individual proposals. These will be defined as follows.

- Major Strength: An aspect of the proposal that is judged to be of superior merit and can substantially contribute to the ability of the project to meet its technical/scientific objectives.
- Minor Strength: An aspect of the proposal that is judged to contribute to the ability of the project to meet its technical/scientific objectives.
- Major Weakness: A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technical/scientific objectives.
- Minor Weakness: A deficiency or set of deficiencies taken together that are judged to weaken the project's ability to meet its technical/scientific objectives.

5.2.2 Merit of the Student Training

The information provided in a proposal will be used to assess the degree to which the goal of providing hands-on payload development and flight experience that will enhance the technical, leadership, and project skills of the student project team will be met. The factors for training merit include the following:

- Factor A-1. Identification of the student team members. The factor includes the multidiscipline student team members, specifying their field of study, and describing their role(s); the project team leader, the faculty PI, and any assigned graduate student mentors; demonstrating that the team has the appropriate multidiscipline and technical background to be successful.
- Factor A-2. Benefit to the key student team members. This factor includes a demonstration of how each student team member will benefit from participating in the project in the assigned position. This also includes the identification of training plans during the project, formal and informal training, and how the student should grow as a result of the project.

- Factor A-3.Benefit to the Institution. This factor includes a demonstration that the project will complement the university's ongoing hands-on training development efforts, and how the project extends the learning achieved by the student project team.
- Factor A-4. Institution support to the project team. This factor includes how well the University will monitor, guide, and/or maintain oversight of the project by the faculty PI and staff in order to support the student team members and assure the successful accomplishment of both the training and investigation technical objectives**.**

5.2.3 Science/Technology Merit and Implementation Feasibility of the Investigation

The information provided in a proposal will be used to assess the intrinsic science/technology merit (value) and the science/technology implementation merit and feasibility of the proposed investigation. Note that these factors concern the evaluation of the quality of the science/technology investigation (i.e., answers science / technology questions), as well as the evaluation of the implementation (or methodology) of the science or technology investigation. The factors for science/technology merit and science/technology implementation feasibility include the following:

- Factor B-1. Science/Technology value and/or Science/Technology utility of the proposed investigation's goals and objectives. This factor includes the clarity of the goals and objectives; how well the proposed investigation's goals and objectives reflect NASA priorities.
- Factor B-2. Likelihood of scientific/technological success. This factor includes how well the anticipated scientific measurements or technology development support the proposed goals and objectives, the appropriateness of the proposed investigation for addressing the goals and objectives, the appropriateness of the anticipated data to meet the goals and objectives, and the appropriateness of the investigation requirements for guiding development and ensuring scientific success.
- Factor B-3. Probability of technical success. This factor includes the plan for technical readiness of the scientific or technology payload; the adequacy of the plan to develop the payload within the proposed cost and schedule; the robustness of those plans, including recognition of risks and mitigation plans for retiring those risks; the ability of the project team to successfully implement those plans; and the likelihood of success for both the development and operation of the payload within the mission design.
- Factor B-4. Probability of project team success. This factor includes the structure of the project team, the development plans in light of proposed goals and objectives, and the role of team members to the proposed investigation.

5.2.4 Mission Feasibility, including Suborbital Platform Compatibility

The information provided in the proposal will be used to assess the feasibility risk. Specific factors include the following:

- Factor C-1. Adequacy of the technical plan. This factor includes assessment of implementation elements, such as the overall project design, including design margins; activities required to accomplish development and integration of all project elements, including the selected carrier.

- Factor C-2. Adequacy of the management approach, including the capability of the student team and its approach to risk management; adequacy of the proposed organizational structure and management approach; the roles of the student team members, including the mentors; and the team's understanding of the scope of work covering all elements of the investigation, through submittal of final report.
- Factor C-3. Adequacy of the cost and schedule. This factor includes an assessment of the investigation's cost and schedule given the proposed suborbital platform, and an assessment of the likelihood of being able to execute the investigation within the proposed budget and schedule.
- Factor C-4. The compatibility of the proposed investigation and carrier resources with those available and the appropriateness of the proposed interfaces will be judged for reasonableness.

Factor C-5 is specific, only for proposers from Space Grant Consortia:

- Factor C-5. Adequacy of required information specific to proposers from Space Grant Consortia, including identification of key innovative technologies that are critical to the success of the project; identification of relevant patented NASA technologies; and discussion of any relevant commercial applications.

5.2.5 Selection Factors

As described above in Section 5.2, the results of the proposal evaluations are based on the defined criteria being considered in the selection process. The overriding consideration for the final selection of proposals submitted in response to this USIP SFRO will be to provide an exciting hands-on training experience to any selected U.S. university student project team while advancing NASA's science and educational goals and objectives within the available budget and schedule for this project.

5.3 Implementation of Selected Proposals

5.3.1 Notification of Selection

Following selection, the project team leader for the selected proposal(s) will be notified by email, followed by formal written notification that may include special conditions or terms of the offer of selection. The regulatory and non-regulatory requirements for management of grant awards can be found at 2 CFR 200, 2 CFR 1800, and the NASA Grant and Cooperative Agreement Manual, all located at the following website:
https://prod.nais.nasa.gov/pub/pub_library/srba/index.html.

The formal notification of selection will also include instructions for scheduling a debriefing, as well as instructions for attending the PIC via videoconference. The non-selectees will be emailed a copy of their evaluation form.

5.3.2 Project Initiation Activities

Project Team Meeting. The undergraduate team is encouraged to hold a project meeting facilitated by the PI to promote team building, outline roles and responsibilities, discuss communications processes, and to ensure the project is ready for an efficient startup prior to the Project Initiation Conference (PIC). SMD, OE and the GSFC/SSOPD will host a PIC via video conference with the selected project team(s) as part of project initiation activities.

5.3.3 Project Management Oversight

The GSFC/WFF SSOPD will assign a mission manager to provide NASA project oversight and to assist the selected USIP teams in the execution of the project, as required. This responsibility will be carried out in large part by regularly attending project meetings and reviews.

6.0 Conclusion

This USIP SFRO represents an innovative way for NASA to advance science and educational goals and objectives while providing a hands-on flight opportunity experience to undergraduate students. SMD and OE invite all U.S. institutions of higher education, including consortia of the National Space Grant College and Fellowship Program (Space Grant), to propose in response to this Student Flight Research Opportunity.

John Grunsfeld
Associate Administrator
Science Mission Directorate

Donald G. James
Associate Administrator
for Education

APPENDIX A Suborbital Platform Capabilities

A.1 through A.5 lists the Points of Contact for Suborbital-Class Platforms: NASA provides different avenues for procurement of suborbital launch vehicle services, including: aircraft, balloons, CubeSats, sRLV, and sounding rockets. All proposers are required to demonstrate the capacity, availability, and commitment of the suborbital-class platform to support their investigation. Proposers are strongly urged to discuss prospective investigations with NASA program personnel (see below) prior to submitting their proposal to ensure that probable operational costs are properly anticipated.

A.1 Airborne Science Program

Within the NASA Science Mission Directorate, the Earth Science Division's Airborne Science Program (ASP) manages and operates unique, modified aircraft that support NASA satellite missions, related scientific experiments, as well as providing platforms for airborne/space borne instrument development. The Program maintains a core asset pool of manned and unmanned aircraft, as well as a range of other NASA-owned and leased aircraft, and provides a gateway to researchers for the use of other aircraft.

For USIP SFRO, a subset of the NASA Aircraft are available to support student flights. ASP will provide project assistance with all aspects of the airborne science investigation, including platform identification, mission/flight planning, integration, and engineering as needed to integrate and fly the payload. Proposers are strongly urged to contact the listed Airborne Science Program Point of Contact directly to identify available manned or unmanned aircraft services.

The full suite of ASP assets, processes, and procedures can be found at: http://airbornescience.nasa.gov.

Questions concerning Airborne Science Program aircraft may be addressed to:

Bruce Tagg
ASP Director, NASA Airborne Science Program
Earth Science Division
Science Mission Directorate
Washington, DC 20546-0001
Telephone: (202) 358-2890
E-mail: Bruce.A.Tagg@nasa.gov

A.2 Balloon Program Office

Within the NASA/GSFC/WFF's Suborbital and Special Orbital Projects Directorate, the Balloon Program Office (BPO) manages scientific ballooning on behalf of the NASA SMD Astrophysics Division. BPO provides balloon launch operations conducted by the Columbia Scientific Balloon Facility (CSBF), and offers a wide range of standard balloon vehicles and support systems to meet user requirements.

For USIP SFRO, projects are eligible to be launched on a NASA standard design, zero-pressure balloon from the NASA remote site at Fort Sumner, New Mexico. BPO will provide standard/nominal support services, including payload integration and checkout/testing prior to launch, launch and flight operations, and payload/data recovery at the end of the flight.

Due to the wide array of possible configurations and flight support systems to meet a team's investigation requirements, proposal teams are encouraged to contact the Balloon Program Office directly to discuss support options, and to obtain technical information related to balloon capabilities and services. BPO has final authority in the choice of which balloon vehicle is used.

Information on the capabilities of current balloon vehicles is available at http://sites.wff.nasa.gov/code820/ and at http://www.csbf.nasa.gov/balloons.html.

Questions concerning balloons may be addressed to:

Debora Fairbrother
Balloon Program Office
GSFC/Wallops Flight Facility
National Aeronautics and Space Administration
Wallops Island, VA 23337
Telephone: (757) 824-1453
E-mail: debora.a.fairbrother@nasa.gov

A.3 CubeSats

CubeSats are short duration miniaturized satellites (built in increments of 10 centimeter cubes, and weighing approximately 1.3 kg per cube) which offer all the standard functions of a normal satellite. CubeSats supported by this USIP SFRO opportunity for funding include volumes of 1U, 2U, or 3U. CubeSats above three units (3U) are not eligible for USIP SFRO.

For USIP SFRO, the orbital launch services for the selected CubeSats will be provided under the HEOMD CubeSat Launch Initiative (CSLI) at no cost to the project. CSLI typically releases an annual solicitation for launch opportunities for CubeSats to fly as secondary (auxiliary) payloads on rockets planned for upcoming U.S. Government missions as well as deployments from the International Space Station. Under the CSLI process, an Agency-wide selection recommendation committee considers candidate CubeSats for selection to be manifested. At an appropriate time following selection, SMD and OE will provide direction to the selected USIP teams for proposal submittal to CSLI process for manifesting on a launch vehicle going to an appropriate orbit.

For information about the CSLI, including previously-selected respondents, see http://www.nasa.gov/directorates/heo/home/CubeSats_initiative.html.

As a result of their secondary status, CubeSats are placed into orbits that are dictated by the primary payload. In any given year a finite number of specific orbits (e.g., inclinations and altitudes) will be available for CubeSats, and the types of orbits available will vary from year to year. Therefore, CubeSat-based investigations requiring very specific orbital parameters may be at a disadvantage for securing a timely launch. USIP SFRO proposals should clearly indicate both the desired and the acceptable range of orbital parameters needed to meet investigation objectives.

CubeSat Mission Parameters								
Mission Name	Mass	Cube Size	Desired Orbit		Acceptable Orbit Range	400 km @ 51.6 degree incl. Acceptable – Yes or No	Readiness Date	Desired Mission Life
			Altitude					
			Inclination					

CubeSats must be compliant with the NASA/KSC Launch Services Program (LSP) Program Level Dispenser and CubeSat Requirements Document and the Compliance and Reference Documents referenced therein. That document may be found at: http://www.nasa.gov/pdf/627972main_LSP-REQ-317_01A.pdf

- Proposals for investigations using CubeSats must satisfy the constraints for a standard CubeSat (one "Cube" or "1U" defined above) and the NASA CubeSat deployer.
- Proposals must specify any constraints placed on the required orbit and orbital lifetime. The likely availability of launches satisfying any constraints in the time period

contemplated will be a consideration for the USIP evaluation. The less stringent the orbital constraints, the more probable it will be that NASA can manifest the CubeSat investigation for launch.

- Proposals must demonstrate knowledge of the requirements for limiting orbital debris and must address how the mission will meet the requirements of NPR8715.6 NASA Procedural Requirement for Limiting Orbital Debris.
- Proposals must address the approach to downlink and uplink communications licensing, frequency band selection, and frequency coordination for operations between space and ground within the RF spectrum.
- All costs for preparing and delivering the CubeSat for launch must be included in the proposal. No integration or launch service charges should be included in the proposal cost request.

Investigators proposing CubeSats are strongly urged to discuss prospective investigations with personnel listed below regarding constraints, launch opportunities, and other technical matters.

For further information on CubeSats, please contact:

David L Pierce,
Senior Program Executive for Suborbital Research
Phone: 202-358-3808,
E-mail: david.l.pierce@nasa.gov

For further information on CSLI, 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,
E-mail: jason.c.crusan@nasa.gov

A.4 Flight Opportunities Program

Suborbital Reusable Launch Vehicles: sRLVs offer newly developed commercial capabilities for the conduct of NASA scientific research, education, and technology advancement. The NASA STMD's Flight Opportunities Program (FOP) has issued commercial contracts to several sRLV flight service providers.

Information on sRLV vehicles, including general vehicle capabilities and contact information for some vendors, is available at http://flightopportunities.nasa.gov/platforms.
Proposers are encouraged to consider these capabilities in designing their investigations, but the Flight Opportunities Program (FOP) has the final authority in the choice of which vehicles to be used.

Proposers interested in using sRLVs as platforms for a USIP investigation should contact the FOP point of contact to discuss prospective investigations with operations personnel in order to identify a vehicle that can provide the technical capabilities required to conduct the proposed investigation.

Questions concerning sRLVs may be addressed to:
LK Kubendran
Flight Opportunities Program
Space Technology Mission Directorate
NASA Headquarters
Washington, DC 20546
Telephone: (202) 358-2528
E-mail: lk@nasa.gov

A.5 Sounding Rockets Program Office

The Sounding Rockets Program Office (SRPO) can provide a wide variety of support to assist USIP SFRO teams in developing their sounding rocket payload and mission design. This support can include payload design, standardized support subsystems (telemetry, attitude control, recovery, deployment mechanisms, fabrication services, etc.), and environmental testing services. It is also possible for the USIP teams to perform all development, fabrication, and testing in-house at their own facility and arrive at the launch site "flight ready," as long as all flight worthiness and safety criteria are satisfied. Due to variable payload configurations and engineering efforts, proposers must contact the SRPO for pre-proposal discussions to identify mission requirements, integration, and test/environmental support services and to develop mission cost estimates.

Sounding Rockets: Information on the capabilities of current available sounding rocket vehicles is available at http://sites.wff.nasa.gov/code810/vehicles.html. Proposers are encouraged to consider these capabilities in designing their investigations, but the SRPO has the final authority in the choice of which vehicle is to be used.

Sounding Rockets Launch Sites. The available sounding rockets launch sites in support of USIP are White Sands Missile Range (WSMR) in New Mexico, and Wallops Island in Virginia.

Information on the Sounding Rockets Program provided services, the vehicles offered, summaries of their capabilities, as well as the processes, and procedures to arrange for flight may be found at: http://sites.wff.nasa.gov/code810/

Investigators proposing sounding rocket payloads should contact the SRPO to obtain technical information related to SRPO launch vehicle capabilities, services, and the latest planned campaign schedules. Questions concerning sounding rockets may be addressed to:

Philip Eberspeaker
Sounding Rockets Program Office
GSFC/Wallops Flight Facility
National Aeronautics and Space Administration
Wallops Island, VA 23337
Telephone: (757) 824-2202
E-mail:Philip.J.Eberspeaker@nasa.gov

APPENDIX B Example Tables and Matrices

TABLE B-1
EXAMPLE SCIENCE/TECHNOLOGY TRACEABILITY MATRIX

Science / Technology Goals	Science / Technology Objectives	Measurement Requirements		Instrument Requirements		Projected Performance	Mission Requirements (Top Level)
		Physical parameters	Observables				
GOAL 1	Objective 1	Column Density of Absorber	Absorption Line	Alt. Range	XX km	ZZ km	Observing strategies: requires yaw & elevation maneuvers
		Density and Temperature of Emitter	Emission Line				Launch window: to meet nadir and limb overlap requirement.
		Size of Features	Morphological Feature	Vert. Resolution	XX km	ZZ km	Need NN seasons to trace evolution of phenomenon
				Horiz. Resolution	XX deg x XX lat x XX long	ZZ deg x ZZ lat x ZZ long	
			Rise Time of Eruptive Phenomena	Temperature Resolution	XX min	ZZ min.	Need MM months of observation to observe variability of phenomenon.
				Precision	XX K	ZZ K	
				Accuracy	XX K	ZZ K	

TABLE B-2
EXAMPLE MISSION TRACEABILITY MATRIX

Mission Requirements	Mission Design Requirements	Spacecraft Requirements	Ground System Requirements	Operations Requirements
From Table B1	Rocket type Launch date: Mission length Orbit altitude requirement and rationale Geographic coverage and how it drives orbit requirement Orbit local time and rationale for the requirement Type of orbit, e.g. Sun synchronous, precessing, Lagrangian point, other Other	Spinning, stabilized Mass Power Volume: Data Rate Temperature Range for spacecraft systems Pointing Control: Knowledge, Stability, Jitter, Drift , Other Detector radiation shielding requirements and rationale Other	Passes per day and duration Assumed antenna size Data volume per day Real time data transmission requirements Transmit frequency Power available for comm (Watts) Downlink data rate Number of data dumps per day Spacecraft data destination (e.g., mission operations center) Science data destination (e.g., science operations center) Other	General spacecraft maneuver requirements and frequency Special maneuvers requirements Rationale for maneuvers Ephemeris requirements Changes in viewing modes and directions per orbit, per day or over longer time periods. Rationale for these changes Other
Mission Requirements or Instrument Accommodation (from Table B1)	Mission	Spacecraft	Ground System	Operations
Four different observing strategies: Solar, limb, nadir, zenith; requires yaw and elevation maneuvers		Agility requirements Slew rate = y deg/sec Settle = stability < .001 deg/sec after 30 secs		Target planning on 3 day centers Ephemeris accuracy of x with updates every 2 days
Instrument X precision of 5K		Thermal stability of 1 deg/hr S/C bus stability of .01 deg over 10 secs	Bit error rate < 1e-5 Time correlation to 2 msec over 1 week	Weekly time correlation

TABLE B-3
TOTAL PROJECT FUNDING PROFILE TEMPLATE

WBS	WBS Element	FY2016 $RY			FY2017 $RY		
		Requested Funding	University Contributions	Total Cost	Requested Funding	University Contributions	Total Cost
01	Project Team						
	Student Salaries						
	Grad Student Stipends						
	Other Stipends, Internships, Scholarships						
02	Support Equipment						
	Lab, Machine shop, 3-D Printers, analyzing instrumentation						
03	Payload(s)						
	Sensors, structures, electronics, cameras, batteries						
	List each major instrument component(s)						
04	Integration and Testing						
	On/Off Campus						
	Test Facilities						
05	Mission Operations						
06	Travel and Shipping						
07	**All Direct Costs** (1 thru 6)						
08	**Indirect Costs**						
09	Total Requested Funding (7 & 8)						
10	University Contributions						
11	**Total Project Cost**						

TABLE B-4
RESERVES/MARGINS CALCULATION DEFINITIONS

Definitions:

Contingency, when added to the current estimate for a resource, results in the maximum expected value for that resource. Percent contingency is the value of the contingency divided by the value of the resource less the contingency.

Margin is the difference between the maximum possible capability of a resource (the physical limit or the agreed-to limit) and the maximum expected value for a resource. Percent margin for a resource is the available margin divided by its maximum expected value.

Example: A payload in the design phase has a maximum expected mass of 115 kg including a mass contingency of 15 kg. There is no other payload on the ELV and the ELV provider plans to allot the payload the full capability of the vehicle, if needed. The ELV capability is 200 kg. The mass contingency is 15/100 = 15% and the mass margin is 85 kg or 85/115 = 74%.

Example: The end-of-life (EOL) capability of a spacecraft power system is 200 Watts, of which 75 Watts has be allocated to the instrument and 100 Watts has been allocated to the spacecraft bus. The power margin is the unallocated 25 Watts or 25/175 = 14.3%. The current best estimate for the instrument power is 60 Watts, leaving 15 Watts or 15/60 = 25% contingency to the 75 Watt maximum expected value.

Acknowledging that the maximum expected resource value is equal to the maximum proposed resource value (including contingency), the above technical terms can be expressed in equation form as:

Contingency = Max Expected Resource Value – current estimate of Resource Value

$$\% \text{ Contingency} = \frac{\text{Contingency}}{\text{Max Expected Resource Value} - \text{Contingency}} \times 100$$

Margin = Max Possible Resource Value – Max Expected Resource Value

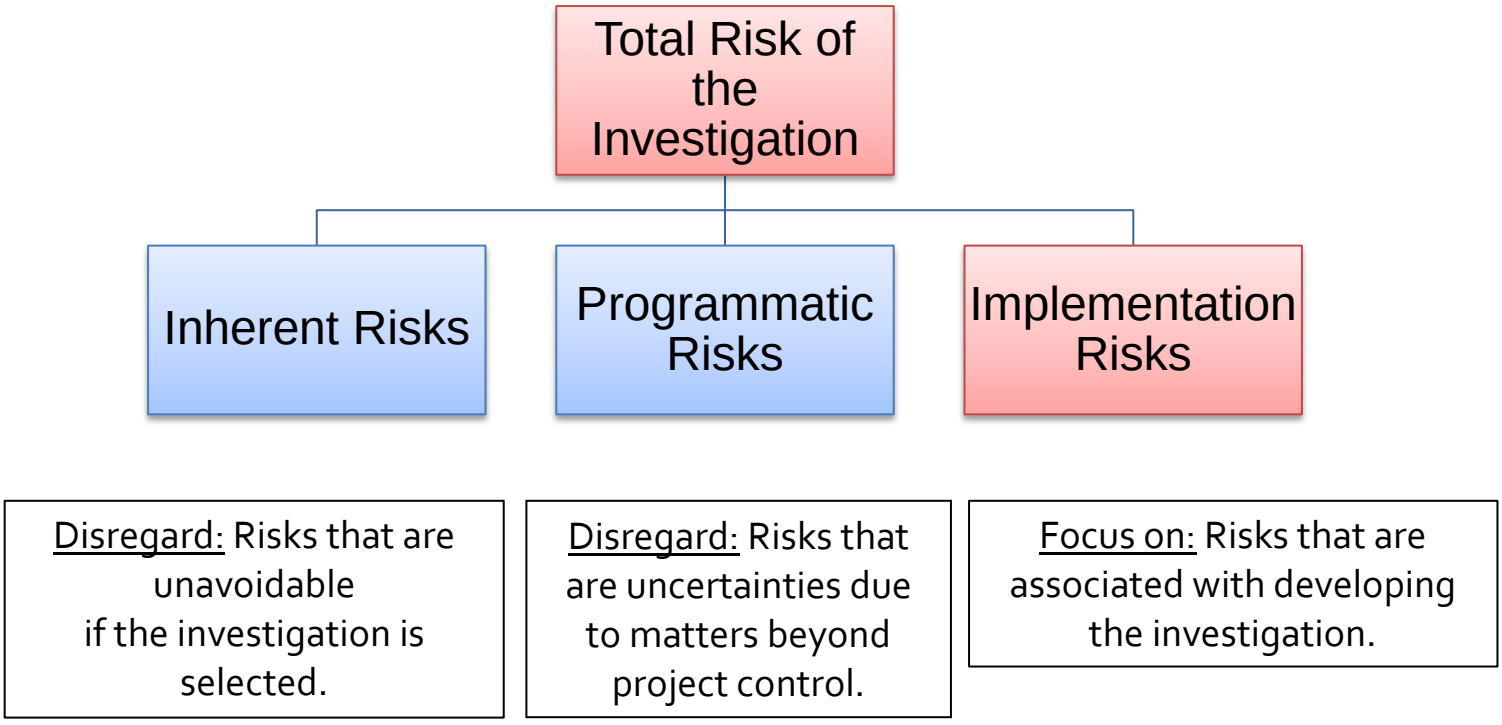
$$\% \text{ Margin} = \frac{\text{Margin}}{\text{Max Expected Resource Value}} \times 100$$

TABLE B-5
OUTLINE FOR USIP SFRO FINAL REPORT

- Summary of the Science/Technology Investigation (objectives/goals)
- Summary of the Team (Faculty PI, Students)
- Student Team organization, student roles and responsibilities
- Number of students who participated in USIP, grade (Fr, So, Jr, Sr), majors/disciplines (e.g., science, engineering, business, etc.)
- For Space Grant: table of student internships – grade, majors/disciplines, internship location and duration
- Project WBS, Budget, and Schedule summary
- Describe the Major Mission Elements (actual payload, suborbital carrier)
- Describe Major Milestones Completed (reviews, design, fabrication, testing, integration, flight, and analysis)
- Describe major mission elements, summary of actual costed elements by WBS.
- Summary of Science/Technology Investigation (accomplishments)
- Summary of Mission Integration, launch, flight profile, flight duration, and payload recovery.
- Mission Results Summary (Investigation results, Summary Data, and Preliminary Observations Summary)
- For space Grant: summary of Innovation Technology Research
- Feedback on the USIP opportunity, summary of mission and learning goals met, skills acquired, and Lessons Learned
- Communications
    - Communication of results/ plans for presentations and publications; conferences to attend
- Recommendations for NASA/SMD/OE

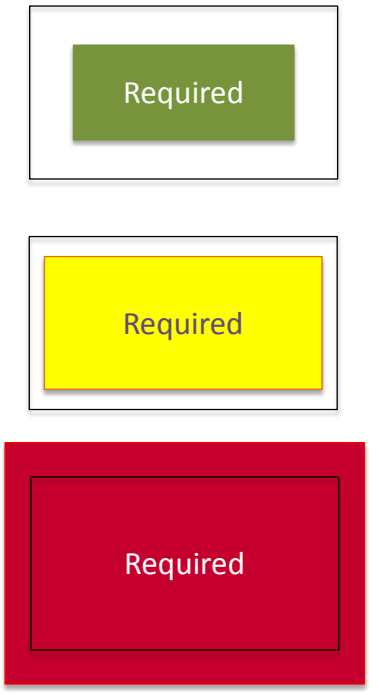
TABLE B-6
USIP RISK DEFINITION AND ENVELOPE

Risk Definition for USIP



The Risk Envelope Concept for USIP

Envelope:
All technical, management, and cost resources available to handle development problems that occur. It includes schedule and funding reserves; reserves and margins on physical resources such as mass, power, and data; descope options; fallback plans; and personnel.



Low Risk: Estimated required resources fit well within available resources.

Medium Risk: Estimated required resources just barely fit inside available resources. Tight, but likely doable.

High Risk: Estimated required resources DO NOT fit inside available resources. Expect project to fail.

APPENDIX C Glossary of Terms and Abbreviations, and Acronyms

Part C.1: GLOSSARY OF TERMS

Basis of Estimate (BOE) — A record of the procedures, ground rules and assumptions, data, environment, and events that underlie a cost estimate's development or update. Good documentation of the BOE supports the cost estimate's credibility.

Categorization — The process whereby proposed investigations are classified with three grades synopsized here as Excellent Recommended, Selectable, or Not Recommended.

Categorization Committee — An *ad hoc* committee appointed by the Associate Administrators for the Science Mission Directorate and Education that categorizes proposals for investigations submitted in response to a solicitation based on the evaluations.

Communications — Comprises the comprehensive set of functions necessary to effectively convey — and provide an understanding of — a program, its objectives and benefits to target audiences, the public, and other stakeholders. This includes a diverse, broad, and integrated set of efforts and is intended to promote interest and foster participation in NASA's endeavors and the develop exposure to, and appreciation for, STEM.

Contingency — That quantity, when added to a resource, that results in the maximum expected value for that resource.

Contribution — Labor, services, or hardware funded by any source other than the Program sponsoring the solicitation.

Education — Comprises those activities designed to enhance learning in science, technology, engineering, and mathematics (STEM) content areas using NASA's unique capabilities.

Grass Roots – A bottoms-up cost estimate which is the result of rolling up the costs estimated by each team member, and for each component, described in the project WBS.

Implementing organization — The university organization led by the Principal Investigator to manage the development of the mission.

Investigation — Activities or effort aimed at the generation of new knowledge. NASA-sponsored investigations generally concern the generation and analysis of data obtained through measurement of space phenomena or Earth phenomena using spaceflight hardware developed and operated for that purpose.

Investigation Team — For USIP, the group of undergraduate students who are implementing the investigation.

Margin — The allowance carried on a resource (e.g., budget, schedule, mass) to account for uncertainties and risks. It is the difference between the maximum possible capability of a resource (the physical limit or the agreed-to limit) and the maximum expected value for a resource.

Mission — Used interchangeably with investigation.

Mission Architecture — The summary level description of the overall approach to the mission in the context of achieving the science objectives, including mission elements such as flight systems, instruments, high-level mission plan, high-level operations concept, etc.

Notice of Intent — A notice or letter submitted by a potential investigator indicating the intent to submit a proposal in response to a solicitation.

Payload — A specific complement of instruments, equipment, and support hardware carried to altitude (or space) to accomplish the mission.

Peer Review (v) — The process of proposal review utilizing a group of peers in accordance with the review criteria, as outlined in the solicitation.

Principal Investigator (PI) — The person who conceives of an investigation and leads implementation of it. For USIP, the PI is the faculty advisor who is invested by NASA with primary responsibility for overseeing the students who are implementing and executing the selected investigation.

Project — Within a program, an undertaking with a scheduled beginning and ending, which normally involves the design, construction, and operation of one or more spacecraft and necessary ground support in order to accomplish a scientific or technical objective.

Project Office — An office established to manage a project.

Proposing Organization — The organization that submits the proposal; commonly this is also the Principal Investigator's home institution.

Real Year dollars — Dollars that have been adjusted for inflation.

Reserve — Resource not allocated to any specific task but held by the project for unexpected needs.

Risk — The combination of the probability that a program or project will experience an undesired event and the consequences, impact, or severity of the undesired event, were it to occur. The undesired event may come from technical or programmatic sources (e.g., a cost overrun, schedule slippage, safety mishap, health problem, malicious activities, environmental impact, failure to achieve a needed scientific or technological objective, or success criterion). Both the probability and consequences may have associated uncertainties.

Student Flight Research Opportunity - A document used to announce opportunities to participate in the Undergraduate Student Instrument Project (USIP).

Selection Official — The NASA official designated to determine which proposed projects will be supported by an award. For USIP, the AA/SMD and AA/Education, respectively, serve as the selecting officials.

Team Leader (TL) — The individual responsible to the PI for leading the student project team. The TL works closely with the PI in order to ensure that the student team meets its objectives within the resources committed to the project.

Work Breakdown Structure (WBS) — A product-oriented hierarchical division of the hardware, software, services, and data required to produce a project's end product(s), structured according to the way the work will be performed, and reflective of the way in which program/project costs, schedule, technical and risk data are to be accumulated, summarized, and reported.

Part C.2: ABBREVIATIONS AND ACRONYMS

AA	Associate Administrator
ASP	Airborne Science Program
BOE	Basis of Estimate
BPO	Balloon Program Office
CBE	Current Best Estimate
CDR	Critical Design Review
CSBF	Columbia Scientific Balloon Facility
CSLI	CubeSat Launch Initiative
FAQ	Frequently Asked Questions
FOP	Flight Opportunities Program
FY	Fiscal Year
GFE	Government Furnished Equipment
GSFC	Goddard Spaceflight Center
HEOMD	Human Explorations and Operations Mission Directorate
HQ	NASA Headquarters
LSP	Launch Services Program
MRR	Mission Requirements Review
NASA	National Aeronautics and Space Administration
NOI	Notice of Intent
NPR	NASA Procedural Requirements
PDF	Portable Data Format
PDR	Preliminary Design Review
PI	Principal Investigator
PIC	Project Initiation Conference
PM	Project Manager
POC	Point of Contact
PO	Program Office
PPOD	Program Level Poly-Picosatellite Orbital Deployer
PS	Project Scientist
RY	Real Year
SE	System Engineer(ing)
SMD	Science Mission Directorate
sRLV	suborbital Reusable Launch Vehicle
SRPO	Sounding Rockets Program Office
STMD	Space Technology Mission Directorate
TMC	Technical, Management, and Cost
TO	Training Opportunity
TRL	Technical Readiness Level
UAS	Unmanned Aerial System
WFF	Wallops Flight Facility
WBS	Work Breakdown Structure
WSMR	White Sands Missile Range

APPENDIX D Summary of USIP Proposal Requirements

Requirement	Description
1	**Submittal Due Date:** Submittal Due Date: Proposals submitted in response to this solicitation shall be delivered to either the NSPIRES or Grants.gov websites no later than the proposal submittal deadline in Section 1.5. All proposals shall be submitted in electronic format only.
2	**Project Team Definition:** Proposals shall identify the multidisciplinary student team members by name, specifying their class year, field of study, and describing their role(s). The proposal shall identify the project Team Leader, the faculty PI, and any assigned graduate student mentors.
3	**Training/Mentoring Plan:** Proposals shall describe plans to train and mentor the project team, including any technical, project management, and leadership training to be utilized. Proposals shall describe any academic courses to be used as part of the project's training, and show relevancy toward the project's goals.
4	**Resumes:** Proposals shall include resumes for the student team members, the PI, key faculty staff, and/or graduate student mentors in the appendix section of the proposal.
5	**Science/Technology Investigation:** Science/Technology Investigation: Proposals shall describe the goals of the science/technology investigation, its relevancy to NASA strategic goals; describe the investigation, the measurements or data to be obtained, and the anticipated results. The response to this requirement should include an appropriate science and/or technology traceability matrix (see Appendix B, Table B-1, example science/technology traceability matrix), which may be included in the proposal appendix.
6	**Payload Development:** Proposals shall describe the complete payload concept, including all of its major subsystems; the approach toward developing it, including plans for purchasing, building, and testing the payload.
7	**Mission Traceability:** Mission Traceability: Proposals shall describe the complete flight system concept, including the investigation design requirements, suborbital-class platform requirements, and operations requirements. The response to this requirement should include an appropriate mission traceability matrix (see Appendix B, Table B-2, example mission traceability matrix), which may be included in the proposal appendix.

8	**Payload Interface:** Proposals shall describe the payload's required support from the suborbital-class platform, including electrical/mechanical interfaces (i.e., power, data, pointing, etc.), and associated fabrication and vehicle integration services. Proposals shall describe plans for integrating and testing the payload with the platform/launch vehicle.
9	**Suborbital Platform/CONOPS**: Proposals shall describe the concept of mission operations for the investigation, (e.g., the anticipated launch location, flight plan, and mission duration) including a discussion of the suborbital-class platform within the Mission Implementation Section.
10	**Schedule:** Proposals submitted in response to this SFRO shall include an appropriately defined schedule, including a narrative of key technical activities and identifying critical milestones, and shall summarize the project's entire life cycle. A schedule foldout is permitted.
11	**Management:** Proposals shall describe the project's proposed management approach, defined student roles and responsibilities, the decision-making process, and any multi-institution teaming arrangement (if one exists).
12	**Risk Management:** The proposal shall discuss the top three project implementation risks, and discuss the approaches to mitigate those risks.
13	**Total Project Cost:** Proposals shall include the proposed total project cost to complete the entire investigation (including requested funding and institutional contributions) in the required cost table (see Appendix B, Table B-3).
14	**Reserves and Margins:** Proposals shall identify any margins in technical performance and schedule reserve necessary to complete the project (see Appendix B, Table B-4).
15	**Letters of Commitment:** If a proposal includes contributions from academic institutions or other entities, the proposal shall identify the contributions, the source of the contributions, and contain the appropriate Letters of Commitment from the contributing organization. Any associated costs for the contributions shall be clearly identified in the budget and counted toward the Total Project Cost.
16	**Space Grant proposals only:** Space Grant Proposals ONLY: For proposers from affiliate institutions of consortia of the National Space Grant College and Fellowship Program (Space Grant), an additional proposal requirement must be addressed, related to Innovation Technology Research, including: 1) Identification and discussion of key innovative technologies, 2) Identification of relevant patented NASA technologies, and 3) Discussion of relevant commercial applications (see Appendix E for details associated with this requirement).

APPENDIX E Information specific to proposers from Space Grant Consortia

E.1 Funding

The maximum funding available from Space Grant for a proposed project (including the design, development, and testing of the payload), student internships and stipends, and innovation technology research is $200,000. OE in collaboration with SMD expects to select at least 30 projects, subject to available funding.

Note to Proposers: Should Congress continue funding Space Grant in FY 2016, NASA Office of Education (OE) may elect to support some of the proposals submitted under this Cooperative Agreement Notice (CAN) rather than open a new competition to reduce administrative costs. Funding above the Space Grant base awards would be used to select additional 2015 USIP proposals (based on the intrinsic merit and relevance to NASA of the proposals received).

E.2 Submission Allowability

Each consortium may submit two proposals composed solely of undergraduate students from an affiliate(s) of the consortium. Any affiliate of the consortium may serve as the submitting institution for the proposal. If the proposal is submitted by a principal investigator other than the Consortium Director, the proposal must include a signed statement by the director attesting that it is the approved submission from the consortium.

Multi-consortium proposals are permitted. However, a consortium may only submit two proposals as the lead consortium (i.e. the approved consortium-only proposal plus one additional.) There is no limit on the number of proposals in which a consortium may participate.

E.3 Funding

In addition to funding for the design, development, and testing of the specific payload described in this solicitation, Space Grant proposals may include the following:

E.3.1 Internship Opportunities – Project team members shall be eligible to be supported for NASA Center- or JPL-based, industry-based, or academia-based internships. For internships, the number of contact hours (time spent on task completion under mentors' direction) must meet a minimum threshold of 400 contact hours per internship. NASA Center and JPL internships for the project team members should comply with the NASA Education standardized funding levels below. Each student shall be responsible for the overall success of the project and must not receive more than 75% of the funding prior to completing the project.

Standardized funding levels for NASA Center and JPL internships:

Classification	Summer – 10 weeks	Fall/Spring – 16 weeks
Undergraduate	$6,000 ($600/week)	$9,600 ($600/week)

E.3.2 Student stipends for research activities – Project team members may be supported for research or design project activities associated with the science/technology development investigation. The proposal shall describe the general nature and conduct of the activities supported. The proposal must clearly distinguish these activities from internships as described above.

E.3.3 Consortium collaborations – For projects that involve multiple consortium affiliates, proposals may include funds that enhance collaborative activities.

E 3.4 Funding Restrictions

- Travel for the Principal Investigator and student team may not exceed $20K/year.
- Graduate students mentoring stipends may not exceed $25K/year.

E.4. Innovation Technology Research (Requirement 16)

E.4.1 Key innovative technologies – Proposals shall identify and discuss two important background technologies that are critical to the success of the project and were developed within the last 20 years (materials, software, instruments such as cameras and sensors etc.). The technologies must be relevant the mission design, operations or instruments outlined in Science/Technology Investigation and Implementation section of the proposal.

E.4.2 Identification of relevant patented NASA technologies – Teams must research and determine if any patented NASA technology will be utilized for the proposed mission. Students are encouraged to conduct a patent search using the U.S. Patent and Trademark Office database *(See* 7-Step US Patent Search Strategy Guide for instructions for conducting the search) (http://www.uspto.gov/products/library/ptdl/services/7_Step_US_Patent_Search_Strategy_Guide_2014.pdf). Proposals shall include a section on the results of this research.

E.4.3 Discussion of relevant commercial applications – Proposals must include a brief statement about whether the project has potential for broad applications to industries such as aviation, aerospace, or military operations. Students are encouraged to visit the NASA Technology Transfer Portal for a complete listing of NASA developed technologies (Bringing NASA Down to Earth: http://technology.nasa.gov/).

E.5 Structure of the Proposal

In addition to complying with the proposal structure described in Section 4.1 of this announcement, Space Grant proposals shall include the following Appendix:

- Student internships, stipends, and consortium collaboration activities: limit 2 pages
- Innovation Technology Research: limit 2 pages

E.6 Space Grant Program Guidelines

The following sections of the *National Space Grant College and Fellowship Program (Space Grant) Training Grant 2015-2018; Space Grant Opportunities in NASA STEM*, Announcement Number: NNH15ZHA003N (http://tinyurl.com/qhnwb2f) apply to this solicitation:

- 1.5.1 America COMPETES Reauthorization Act
- 1.5.2 NASA Strategic Plan and Relevance to Education
- 1.5.3 NASA Office of Education Lines of Business (LOB): Institutional Engagement; NASA Internships, Fellowships, and Scholarships, and STEM Engagement only
- 1.5.4 NASA Education Priorities: Table of Performance Goals and APIs
- 2.0 Space Grant Background
- 2.1 Program Overview and Guidelines
- "Internships" definitions and guidance as discussed in the original announcement and subsequent Amendments and FAQs (http://tinyurl.com/neozt8a)

E.7 Data Submissions, Annual Progress Reporting, and Final Reports

Consortia are required to submit performance data, student profile and award information (for all students who receive a significant, direct award), and project information through the NASA Office of Education Performance Measurement (OEPM) system and in coordination with NASA Headquarters Office of Education. Since OEPM will allow for the ongoing submission of data throughout the year, consortia must be prepared to support the Space Grant Program Office in quarterly program reviews.

In addition to the aforementioned reporting requirements, consortia will be required to submit accurate Student Data Tables, Student Award Records, and Expenditure Summaries in conjunction with their OEPM data. The collection and submission of student data is a requirement in order to receive annual funding under the terms of this award. Student Award Records must properly designate the funding source of each award, as well as the type of award that is made. Please review the definitions of awards before submitting award records into OEPM. Student Data Tables will be used to verify Student Award data in OEPM as well as to longitudinally track students after the conclusion of the award. Awardees will report the status of longitudinal tracking results annually to the NASA Office of Education. The template for these reports will be

provided to the consortia each year by the Space Grant Program Office and are essential to verifying OEPM data. Consortia must also administer baseline and follow-up surveys to participating mentors and students; this action is pending approval of OMB clearance to collect this information under the Paperwork Reduction Act and shall be coordinated through the NASA Office of Education. Baseline surveys are administered to students and mentors at the start of a project activity with the follow up instruments administered dependent upon project activity period. Withholding student funding until completion and submission of baseline and survey instruments is highly encouraged.

Per grant regulations, consortia will continue to be required to submit annual progress reports. Consortia will be given guidelines for the submission of OEPM data and the annual progress report. Every effort will be made to streamline the reporting burden for the consortia while facilitating the compliance with Federal and Education reporting requirements by the National Space Grant Office.[1]

E.8 Partial Awards and Participation with Others

NASA Office of Education may elect to offer selection of only a portion of a proposed project, usually at a level of support that is reduced from that requested in the original proposal. NASA may also offer tentative selections in which NASA requests proposers to team on a joint project. Additionally, NASA may decide to award an effort for less than the full duration of the proposal. In either case, the proposer will be given the opportunity to accept or decline such a selection. If the proposer accepts such an offer, a revised budget and statement of work may be required before NASA can initiate funding action on the proposal. If the proposer declines the offer of a partial selection, or participation in a joint proposal, NASA may withdraw the offer of selection in its entirety.

E.9 Process for Appeals Prior to Formal Requests for Reconsideration

This CAN is limited to awarding grants and cooperative agreements. Accordingly, the appeals and reconsideration processes under this CAN do not include protest rights either at the U.S. Government Accountability Office (GAO) or with the Agency, as defined in FAR 33.101. The provisions at FAR 52.233-2 ("Service of Protest") and NFS 1852.233-70 ("Protests to NASA") do not apply to this CAN.

A PI who is not satisfied with the explanation of the basis for the declination of its proposal may contact the Aerospace Research and Career Development (ARCD) Director, Office of Education, NASA Headquarters, in writing (delivered via email, fax or regular mail) stating the reasons for requesting reconsideration of the declination and requesting an oral debriefing before initiating a formal Request for Reconsideration. The ARCD Director must provide the debriefing expeditiously; i.e., usually within two weeks. Send a first request for an oral debrief to:

[1] Language accessed from the NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) OFFICE OF EDUCATION NATIONAL SPACE GRANT COLLEGE and FELLOWSHIP PROGRAM (SPACE GRANT) Training Grant 2015-2018 Space Grant Opportunities in NASA STEM Announcement Number: NNH15ZHA003N

Dr. Lenell Allen
Director, Aerospace Research and Career Development (ARCD)
Office of Education
NASA Headquarters
Phone: (202)358-1762
Email: Lenell.Allen@nasa.gov

Submitters should understand that appeals or reconsiderations will be limited to the original proposal submitted by the established deadline for full proposals. Appeals or requests for reconsideration based on results or information obtained after the proposal was submitted or peer reviewed, for example, are not appropriate. Furthermore, because of factors such as program budget and other priorities factored into the selection process, reconsideration will not necessarily result in an award even if it is established that there was an error in the peer review evaluation or other evaluation processes.

Following an oral debriefing with the ARCD Director, if still not satisfied that the proposal's evaluation process was fair and reasonable, substantively and/or procedurally, a PI whose proposal has been declined may request a formal reconsideration within 30 days of the debriefing. Electronic or faxed requests for formal reconsiderations will not be accepted. Formal requests must 1) detail the reasons for the reconsideration request; 2) be printed on institutional letterhead; 3) be co-signed by the PI and the AOR and 4) be addressed to the Selection Official:

Mr. Donald G. James
Associate Administrator for Education
NASA Headquarters
Washington, DC 20546
Telephone: 202-358-0103

NASA's 2015 *Guidebook for Proposers* states:

> "H.3 Requests for Reconsideration.
> (ii) Written Request for Reconsideration to Selecting Official. Following the debriefing, dissatisfied PIs must within 30 calendar days of the debriefing submit in writing a Request for Reconsideration to the Selecting Official. If no debriefing has been conducted, the Request for Reconsideration must be submitted within 60 calendar days of notification that the proposal had been declined. The Selecting Official will respond in writing to the Request for Reconsideration within 30 calendar days. If additional time is required to prepare a response, an explanation of the need for more time will be given to the PI within 30 calendar days.

Technical Note: NASA's Office of Education has a Task Order with **VALADOR, Inc**. (NNH12CD13Z) to support the Aerospace Research and Career Development Program composed of the National Space Grant College and Fellowship Program and the Experimental Program to Stimulate Competitive Research (EPSCoR) Program. To further avoid any possible perception of real or potential conflict of interest, Valador may not

otherwise serve as a subcontractor, partner, or collaborator to an entity proposing under the Space Grant or EPSCoR Solicitations.