

**National Aeronautics and Space Administration
Johnson Space Center
Human Exploration and Operations Mission Directorate
2101 NASA Parkway
Houston, TX 77058**

RESEARCH OPPORTUNITIES FOR ISS UTILIZATION

NASA Research Announcement: NNJ13ZBG001N

**Soliciting Proposals for Exploration Technology Demonstration and
National Lab Utilization Enhancements**

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**PROPOSALS ACCEPTED November 30, 2012 THROUGH December 31,
2024**

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I. Funding Opportunity Description

A. Scope

This announcement is for the development of research or related hardware with enhanced capabilities; modification of existing hardware to enable increased efficiencies (e.g. less crew time or up mass); development of tools that allow analyses of samples and specimens on orbit; enhanced infrastructure capabilities on the International Space Station (ISS) (e.g. communications or research throughput); concepts contributing to the development of a sustainable, scalable, and profitable non-NASA demand for LEO services; broad commercial use of the ISS; development of flight, training, and outreach products; and specific commercialization, technology demonstration, and other ISS program-supported projects as detailed in specific Focus Areas.

B. Overview of ISS Utilization Focus Areas

The unprecedented opportunity exists in using the ISS platform to advance key technologies and other capabilities for the next steps in commercialization of space, in-space operations, and advancing space exploration. The ISS is a one of a kind laboratory that offers access to microgravity, constant crew support, robotic servicing, and the harshness of the space environment.

For reference, below are links to research guides detailing the capabilities of the ISS:

https://www.nasa.gov/connect/ebooks/researchers_guide_tech_demo_detail.html

http://www.nasa.gov/mission_pages/station/research/researcher_guide/

The 2005 NASA Authorization Act designated the U.S. segment of the ISS as a National Laboratory and directed NASA to develop a plan to "increase the utilization of the ISS by other Federal entities and the private sector..." As the nation's newest national laboratory, the ISS will further strengthen relationships among NASA, other Federal entities, and private sector leaders in the pursuit of national priorities for the advancement of science, technology, engineering, and mathematics. The ISS National Laboratory will also open new paths for the exploration and economic development of Space.

The National Laboratory concept is an opportunity to expand the U.S. economy in space-based research, applications and operations. The ISS represents a unique and highly visible national asset with surplus capacity available for a wide spectrum of applications. NASA will continue to cover the cost of operating and maintaining the ISS and is highly motivated to work with other agencies and organizations to pursue applications.

NASA seeks proposals to enhance the unique capabilities of the ISS and utilize the ISS to develop and/or operate systems or facilities that may lead to a sustainable non-NASA demand for a human-rated LEO platform. These proposals should demonstrate ability to provide a stimulus to the U.S. economy through development of a sustainable, scalable, and profitable non-NASA demand for LEO services.

The topics listed in the Focus Areas below span the broad interests of NASA but should not be considered as the entire scope. NASA welcomes white papers and proposals in all areas relevant to the National Lab mission, NASA's LEO commercialization goals (<https://cms.nasa.gov/leo-economy/low-earth-orbit-economy>), and NASA's technology development and other interests, not

only those listed in this document.

General Focus Areas

- 1) Innovative uses of the ISS or ISS hardware that leverage existing capabilities to stimulate both utilization of the ISS and economic development in the U.S.
- 2) Other improvements to existing ISS capabilities, including but not limited to infrastructure, in-situ analytical tools, and communication/data transmittal, to increase the efficiency and effectiveness of the technology demonstrations and science investigations performed on the ISS.
- 3) Unique partnering arrangements that leverage NASA's existing capabilities but increase the commercial participation in research, technology development, on board services, and other commercial activities.
- 4) Broad uses of the ISS and its resources by the U.S. commercial sector.
- 5) Development of flight, ground, training, and general outreach hardware and capabilities.

Specific Focus Areas

Focus area 1- Demand Stimulation:

The ISS Program is soliciting proposals for commercial concepts contributing to the development of sustainable, scalable, and profitable non-NASA demand for utilization of LEO capabilities. NASA is specifically seeking proposals with focus on the areas of in-space manufacturing and regenerative medicine/bioengineering and will also consider other fields that may lead to a scalable, financially self-sustaining demand for LEO capabilities. Successful proposals will further mature concepts with potential for scalability, such as returning high-value items for terrestrial use, capturing sizeable markets or creating new markets, and disrupting existing technologies by taking advantage of the ISS, and eventually follow-on human-rated destinations in LEO. NASA seeks concepts that, if successful, will utilize a breadth of LEO capabilities: they will benefit from the scalability that commercial platform(s) can provide; their transportation needs will support the growing U.S. crew and cargo launch industry; and their presence on commercial platforms will strengthen the LEO ecosystem that NASA seeks, as one of many customer(s) of the commercial platform(s).

In addition to a complete detailing of the technical concept, proposals must include a detailed assessment of potential markets they intend to serve (particularly non-NASA markets), as well as the ability of the proposed venture eventually to be self-sustaining and able to cover market costs (unsubsidized) of all resources required (up/down transportation, “rent” of space on a LEO commercial module/platform, etc.). Documentation of interest from, or partnerships with, downstream commercial entities with the ability to push finished products into the commercial sector is required. Documentation of investor interest, should the venture be demonstrated successfully on the ISS with achievement of a minimally viable product (MVP), is also required. Amount of investment/cost sharing by the proposing entity will also be evaluated.

Note that parabolic or sub-orbital testing may be beneficial for risk mitigation and functional demonstration of hardware and procedures in a relevant environment prior to on-orbit operations. Where appropriate, proposers may address how parabolic or sub-orbital flight testing is beneficial for the ISS

utilization proposed. More information about how to request separate funding for parabolic and/or sub-orbital flight testing as part of a proposal to this NRA may be found at this NASA Flight Opportunities program website:

<https://www.nasa.gov/directorates/spacetech/flightopportunities/opportunities/iss-utilization>

As a result of this solicitation, the ISS Program intends to offer a series of targeted awards in three Phases:

- 1) Early concept development (awards nominally up to \$200k),
- 2) Design maturation and prototype development (awards nominally up to \$1.5M), and
- 3) Flight hardware production and in-flight operations to gain actual experience in the LEO environment (awards nominally up to \$5M).

Respondents will self-identify which phase they are submitting to, based on the stage of development of their project, as well as the schedule for forward work leading to LEO operations. Additional awards following successful completion of early phase contracts are contemplated.

All proposals must include the following business case items:

- Work plan, including project schedule and estimated cost for the currently proposed phase, as well as estimates for future phases
- Experience and qualifications of project manager, principal investigator, other key personnel, consultants and subcontractors
- Description of commercial offering(s), if project is successful, including analysis of market opportunities, maturity and risks, as well as scientific and technical merit and feasibility
- Proposed contract deliverables and payment milestones
- Corporate/private cost sharing

Additionally, all Phase 3 proposals must include the following:

- ISS integration approach and on-orbit resource requirements (e.g. crew time, power, data, operational and stowage volume, etc.)
- Use of NASA ground facilities and equipment
- Concept of operations on ISS
- Target markets/customers (domestic and foreign), including letters of intent or other substantiation of market potential
- Business development and go-to-market approach
- Non-NASA investor interest, including letters of intent or other substantiation

- Scalability potential for commercial production and plan(s) for transition to a commercial platform(s)
- Approach to export control and intellectual property, with customers and government
- Technical and Business risks, challenges, and barriers to achieving profitability and sustainability, including proposed mitigations and recommended government actions.

Focus Area 2 – (Deleted)

Focus Area 3- Purchase of Resources for Commercial Purposes:

The International Space Station continues to be open for commercial business.

NASA is opening the International Space Station to expanded commercial and marketing opportunities that will continue the agency's efforts to develop a sustainable economy in LEO. NASA has reserved a set amount of resources, available to U.S. entities, intended to serve commercial and marketing activities. The governing policies are the [NASA Interim Directive \(NID 8600.121\)](#) on Use of International Space Station (ISS) for Commercial and Marketing Activities, the [Commercial and Marketing Pricing Policy](#), and the [Crew Code of Conduct](#).

Only U.S. entities may purchase resources to pursue the following activities on the ISS:

- Commercial activities, including any activity that can be defined as non-government, but is not considered research or technology development. This includes manufacturing, production, or transportation of goods.
- Marketing activities that are factually accurate and meet the NASA media guidelines.

All commercial and marketing activities that utilize ISS resources will require a Reimbursable Space Act Agreement (RSAA) with NASA to recover costs for the resources. [Information about RSAA may be found here.](#)

Companies may not resell purchased resources under any circumstances.

To request purchase of any of the listed resources, a U.S. entity must submit a white paper (up to 6 pages) describing the cargo and/or onboard activities enabled by this purchase request, as well as the resource request form, found at:

<https://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=704824/solicitationId=%7B21E0270C-BC1F-EFC4-3D87-30713B5FF373%7D/viewSolicitationDocument=1/ISS%20Commercial%20Activities%20Form.pdf>

and uploaded via NSPIRES to this NRA.

Requests will be evaluated using the following pass/fail criteria:

1. Evidence that the entity requesting resources meets the criteria of a U.S. entity
2. Compliance with one or more of the following:
 - a. Require the unique microgravity environment; or
 - b. Have a nexus to NASA's missions; or
 - c. Supports a sustainable LEO economy
3. Conformance with NID, Crew Code of Conduct, and other policies governing commercial activities on the ISS
4. Reasonableness of amount of resources requested

Resource requests will be reviewed on a first come, first served basis. U.S. entities will have ability to use purchased resources during a two-year period from signing of RSAA based on a best-efforts approach; any unused resources may be utilized after that period but will only be on a non-interference basis.

Entities must indicate any foreign entity benefits. Preference will be given when primary customer of entity purchasing resources is also a U.S. entity or individual.

Focus Area 4- Private Astronaut Missions to the International Space Station (ISS)

NASA has outlined a broad strategy to facilitate the commercialization of LEO by U.S. companies. As part of that strategy, NASA plans to enable private astronaut missions to the ISS. NASA defines a private astronaut mission as a commercial mission consisting of activities to be conducted on the ISS (or in a commercial segment attached to the ISS) by private astronauts, transported on a U.S. commercial launch vehicle dedicated to this private mission. These private missions must use U.S. transportation vehicles that meet NASA's ISS-visiting vehicle requirements.

To this point, NASA has accommodated the pursuit of private astronaut missions under this NRA umbrella, and multiple companies have come in through this process. This focus area intends to build on the experience to date and provide a path for additional entities to pursue private astronaut missions.

NASA has identified the following required steps to begin the process of assessing and integrating these missions:

1. Submission of a white paper to this NRA. Among other things, content should include the following: mission overview (duration, number of crew, notional training level of each crewmember); desired use of ISS resources (life support, waste and hygiene, emergency equipment, research and/or stowage accommodations, etc.); expected activities to be conducted by the private astronaut mission crew; launch vehicle; provisioning of consumables; potential services that may be offered for sale to NASA during the private mission (note: while NASA will entertain offerings of commercial services, such as cargo transportation and crew time, there is no guarantee that any services will be procured or budget available to support any such offerings). This focus area will remain open indefinitely.
2. NASA will hold one or more meetings with the private astronaut mission provider in order to conduct a high-level feasibility assessment of the proposed mission and will report findings to the provider.

NASA has assessed the ability to accommodate four private astronauts for thirty days on ISS, potentially up to two times per year, and determined that it is technically feasible. Proposals exceeding these constraints will be reviewed for feasibility but carry significant risk for execution. Ongoing mission considerations and visiting vehicle traffic to the ISS may impact NASA's ability to support these private missions.

If the proposed mission is determined to be feasible, the provider will continue development of the mission and begin completing a series of agreements and actions, which, if completed successfully will result in assignment of a target mission window on the ISS Flight Program Integration Panel (FPIP) Flight Plan. Based on a successful mission feasibility assessment, NASA will work with the provider to develop agreements necessary to establish the framework for a future mission and to lay out the steps required to enable the mission.

NASA will identify up to two candidate private astronaut mission opportunities per year based on currently available scheduling information. NASA holds the responsibility to manage the mission opportunities and integrated requirements for all United States On-orbit Segment partners, their researchers, and commercial entities. NASA is also responsible for integrating these requirements with the Russian and commercial vehicle-provider constraints for vehicle traffic to the ISS. Private astronaut mission scheduling availability will be

~~subject to these overall opportunities and integrated requirements, and is subject to change given vehicle traffic changes, anomalies, or other unforeseen circumstances.~~

~~Evaluation criteria:~~

- ~~• Work plan and project schedule~~
- ~~• Experience and qualifications of project manager, principal investigator, other key personnel, consultants and subcontractors~~
- ~~• Feasibility of proposed mission (duration, number of crew, training level of crew, etc.)~~
- ~~• Services, facilities, resources, and equipment required from NASA~~
- ~~• Services, facilities, resources, and equipment offered to NASA~~
- ~~• Implementation approach and roles of NASA, industry, and other organizations~~
- ~~• Proposed cost share or in-kind contributions from proposer, including letters of intent or other substantiation~~
- ~~• Approach to export control and intellectual property, with customers and government~~
- ~~• Technical and Business risks, challenges, and barriers to achieving long-term market growth, including proposed mitigations and recommended government actions~~

Focus Area 4A - Private Astronaut Mission (PAM) Provider

NASA has outlined a broad strategy to facilitate the commercialization of LEO by U.S. companies (see [NID 8600.121: “Use of International Space Station for Commercial and Marketing Activities”](#)). As part of that strategy, NASA plans to enable private astronaut missions (PAMs) to the ISS. These private missions must use U.S. transportation vehicles that meet NASA’s ISS visiting vehicle requirements, policies, and procedures.

NASA has accommodated the pursuit of private astronaut missions under this NRA umbrella, and multiple companies have entered into this process. This focus area intends to build on the experience gathered to date and provides a path for additional entities to pursue private astronaut missions.

As a part of this announcement, NASA will identify up to two candidate private astronaut mission opportunities per year based on currently available scheduling information. NASA holds the responsibility to manage the mission opportunities and integrated requirements for all United States On-orbit Segment (USOS) partners, their researchers, and commercial entities. NASA is also responsible for integrating pertinent international partner and commercial vehicle provider constraints for the purposes of managing vehicle traffic to the ISS. *Private astronaut mission scheduling availability and implementation will be subject to these overall opportunities and integrated requirements, and is subject to change given vehicle traffic changes, anomalies, or other unforeseen*

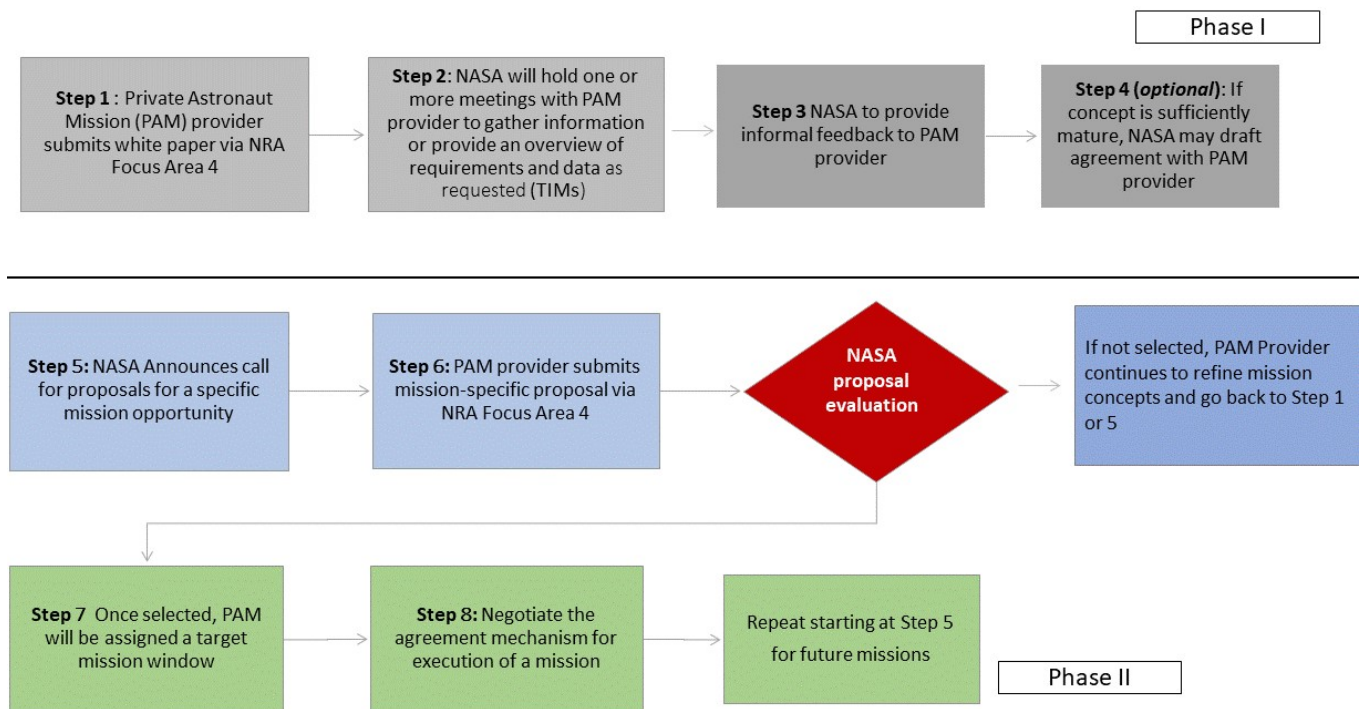
circumstances, NASA missions will take precedence.

Private Astronaut Mission (PAM) opportunities on ISS are very limited and NASA has updated the original process to ensure increased competition in the award of specific missions to the ISS. NASA has assessed general ability to support up to two missions per year, with no individual mission exceeding thirty days. While the ISS is able to support thirty-day missions, opportunities of this duration are likely to be more limited than those of shorter duration (~two weeks) and will result in increased scheduling constraints.

PAM information and requirements have been consolidated into a technical library. Up to 2 potential PAM Provider representatives can request access by emailing the hq-leo-economy@mail.nasa.gov mailbox with the following information in order to be cleared for export controlled data:

- Name, Company Name, Citizenship, Contact Phone Number, Contact e-mail address and NASA Doman Consolidation (NDC) Username (if applicable)

A two-phase process for assessing and awarding PAM missions is outlined below:



Phase I: Submission of a generic mission or multi-mission concept white paper to this NRA through NSPIRES:

This phase allows the PAM Provider the ability to receive initial feedback regarding their mission concept and readiness and provides for technical interchange to ensure the PAM Provider clearly understands the PAM requirements, roles, and responsibilities outlined by NASA. This focus area will remain open indefinitely. Whitepapers may be submitted at any time and should include as much information as known based on the Phase II proposal criteria including any mission specific reference information. *NASA feedback received during Phase I regarding a particular mission concept does not guarantee a mission award.* While NASA will entertain offerings of commercial services as a part of a mission concept, such as cargo transportation and crew time, there is no guarantee that any services will be procured or budget available to support any such offerings.

NASA may hold one or more meetings with white paper submitters to review PAM framework and expectations; PAM provider roles and responsibilities; required and available NASA-provided resources, services, and pricing; and overview of ISS PAM requirements. Additionally, NASA will work with the PAM Provider to review the general PAM terms and conditions in preparation for a potential future mission award.

Submission of a generic mission or multi-mission concept white paper and participation in Phase I is not required in order to submit a proposal, or to be considered for a mission specific award, as part of a Phase II mission specific opportunity announcement.

Phase II: Submission of proposals to NRA mission specific opportunity announcements:

This phase provides PAM providers the ability to submit a mission-specific proposal against NASA available flight opportunities that will be competitively evaluated for a possible award. Proposals will be solicited annually, or as available. Details associated with each request for mission-specific announcement will be made available through this NRA and updated as required. Required proposal content, evaluation criteria, and schedule will be updated in this NRA no later than 30 days prior to the proposal cycle.

Except as stated below, proposals will be evaluated in accordance with the *NASA FAR Supplement, Section 1852.235-72*, and as reflected in the *NASA Guidebook for Proposers*. All information needed to apply to this solicitation is contained in this NRA and anything not mentioned here is subject to the default Agency rules in the *NASA Guidebook for Proposers*. Proposers are responsible for understanding and complying with its procedures for the successful, timely preparation and submission of their proposals. Proposals that do not conform to its standards may be declared noncompliant and returned without review. The evaluation criteria below are tailored to this focus area and will be used for the evaluation of Private Astronaut Mission specific proposals. The evaluation criteria listed here take precedence over the evaluation criteria referenced in Appendix D of the *NASA Guidebook for Proposers*.

The criteria considered in evaluating a Private Astronaut Mission (PAM) proposal are:

- The technical credibility of executing the proposed mission within NASA's outlined framework, and ability to meet NASA's requirements.
- The ability of the proposer to provide the personnel, resources, financing, and partnerships necessary to plan and execute the proposed mission.
- The reasonableness and credibility of supporting the proposed mission integration schedule and milestones.
- The proposal's alignment with NASA's vision for the commercialization of LEO and consistency with [NASA's commercial policy on the Use of ISS for Commercial and Marketing Activities](#).

Request for proposals will provide details on the specific number and duration of missions to be awarded for that call. Proposals exceeding the crew and duration constraints described above will be reviewed for feasibility but carry significant risk for execution and award.

Proposals should be structured as detailed below. Additional sections and/or content may be added, if needed, to effectively communicate the content of a proposed mission. Proposals should be limited to no more than 30 pages, not including any attachments. Sections and content should emphasize, at minimum, the following material:

- i. Title Page:
 - a. Include any Notice of Restriction on Use and Disclosure of Proposal Information
 - b. The proposer and proposal name/title
 - c. Date of the proposal
 - d. The title, NRA number, including version associated with announcement
 - e. Organization name and address
 - f. Proposer Point of Contact name, title, e-mail address, and phone number
- ii. Proposal Abstract:
 - a. Provide an overview of the proposed mission concept, including key mission parameters, objectives, teaming arrangements, and constraints, as well as the proposer's experience, capabilities and qualifications.
- iii. Table of Contents:
 - a. Include a one-page Table of Contents that provides a guide to the organization and contents of the proposal.
- iv. Mission Overview:
 - a. Describe the details and parameters of the proposed mission, as well as any areas of flexibility and/or constraints that should be considered. This should include, at a minimum, the following:
 - i. Proposed mission duration (both total duration and docked to ISS)
 - ii. Planned launch and transportation vehicle
 - iii. Number of primary and backup crew members, roles and planned training
 - iv. If known, details of proposed crew members, including:
 1. Names and background of proposed crew and/or crew selection criteria
 2. Anticipated training and experience of each crew member
 - v. Significant mission objectives or activities to be performed during the mission, including the durations and scope of any proposed activities as well as any ISS resources being requested to support
 - vi. Details of any unique hardware and/or operations to be utilized or performed during the mission
 - vii. Known details of any commercial activities, public affairs and/or outreach activities proposed
- v. Mission Integration Approach:
 - a. Describe the proposer's experience, capabilities, qualifications, resources, and key mission personnel. Key personnel should be provided for both the proposer and from contractors/partners in key areas of mission integration.
 - b. Describe the approach, methods, pertinent teaming arrangements, and integration schedule/milestones for key areas of mission integration. Particular focus should be given to describing how the proposer will maintain compliance and adherence to requirements, processes, and integration milestones outlined in *SSP SSP 51087 - ANXI, Private Astronaut Mission (PAM) Authorization, Coordination and Execution (PACE) Annex 1*. Key areas of mission integration include, but may not be limited to:
 - i. Transportation Vehicle/Provider Integration
 - ii. Crew Training Plan
 - iii. Medical Certification, Support and Health Stabilization Plan
 - iv. Crew provisions/hardware certification and flight integration
 - c. Describe the approach and teaming arrangements to support launch and landing services.

- d. Provide a description of roles and responsibilities for the proposer and all related entities, including primary interfaces with NASA and the transportation provider.
 - e. Describe the major services, facilities, resources, and equipment required from NASA in order to execute the proposed mission. Use *SSP 50192 - Private Astronaut Resources, Interfaces, and Services (PARIS) for ISS*, as a resource to assist in the identification of potential services needed. Include any unique or non-standard requests for services.
- vi. Mission Cost and Business Approach:
 - a. Provide a status on the financial health of the PAM provider executing the proposed mission in order to demonstrate the ability to accomplish mission activities. Metrics for financial health include, but are not limited to:
 - i. Adjusted Earnings Before Interest, Tax, Depreciation, Amortization (EBITBA)
 - ii. For companies in the early stage of development (i.e. a startup) - strength of balance sheet (e.g. cash on hand)
 - iii. Free cash flow (FCF)
 - iv. Business unit or division financial statements/ results
 - b. Explain the financial viability and proposed funding plan for executing the proposed mission. This plan should show an understanding of the costs to be incurred due to services procured from NASA as described in the current NASA pricing policy, as well as those from other commercial and government partnerships required to execute the mission.
 - c. Provide a status of teaming agreements and/or partnerships with other commercial and/or government entities. Describe any supplemental evidence being provided to show that the proposer will be successful in securing the appropriate partnerships to execute the proposed mission. Evidence may include signed letters of intent, signed agreements, proof of contracts, or other substantiation for both customers (e.g. private astronauts) and contractors (e.g. transportation provider).
 - d. Describe plans to comply with the Terms and Conditions associated with the execution of a Private astronaut mission as described in (*reference to be added*).
 - e. Provide a description of any services or commercial offerings being presented to NASA as a part of the proposal.
- vii. Attachments:
 - a. Documentation of any proposed partnerships, agreements, or letters of intent
 - b. Financial health supplemental documentation

Focus Area 4B- Private Astronaut Mission (PAM) Commercial Activities

For new or complex commercial proposed activities, in order to reduce risk, potential customers of PAM providers may submit a white paper under Focus Area 4B in order to request NASA assistance in evaluation of the technical feasibility of their concept and adherence to NASA policies. The purpose of this technical exchange is to allow PAM customers to receive initial feedback from NASA regarding feasibility of proposed commercial activities in parallel or before contracting with a private astronaut mission provider. PAM customers will be expected to partner with a PAM provider as part of a mission specific proposal under Phase II of Focus Area 4A, in order to be considered for a PAM activity. NASA engagement in discussions with a potential PAM customer is for advisory purposes only. *Any NASA assistance, information exchange, or feasibility feedback does not guarantee that a final proposal, when integrated with a PAM provider mission, would be awarded by NASA.*

Additional Resources

For additional information regarding PAM missions, please refer to the following links:

- [Private Astronaut Missions](#)
- [Pricing Policy](#)

Focus Area #5 – (Deleted) High school students United with NASA to Create Hardware (HUNCH)–Administration

~~Section 203 (a) (3) of the Space Act says NASA is “to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof, and to enhance public understanding of, and participation in, the Nation’s space program in accordance with the NASA Strategic Plan.” In accordance with the NASA 2018 Strategic Plan, Strategic Objective 3.3 to Inspire and Engage the Public in Aeronautics, Space and Science, one of NASA’s goals is to contribute to education and public outreach. NASA’s education and outreach functions to inspire and engage the public and students, each playing a critical role in increasing public knowledge of NASA’s work and fostering an understanding and appreciation of the value of STEM and enhancing opportunities to teach and learn.~~

~~NASA’s HUNCH Program contributes significantly to NASA’s strategic goals. NASA is announcing an opportunity to administer and grow this program through this solicitation. While the HUNCH Program is intended to inspire students to pursue careers in STEM, its deliverables include the production of flight, training, and informative products used in the day-to-day operations of the ISS. This aspect of the program provides students the opportunity to produce actual goods and services required to meet NASA’s needs while being exposed to the stringent requirements involved in producing deliverables for NASA. Reference the below HUNCH Program Description and attached documents for more information about the HUNCH Program.~~

~~White papers and proposals shall include a detailed business plan to administer the HUNCH Program and accomplish program goals. Proposers are encouraged to submit new and creative management plans that accomplish HUNCH Program goals. Proposals will be evaluated based on the following criteria:~~

- ~~— Expansion of industry partner participation: plans to increase leverage of relevant industries to allow increasing participation in HUNCH within existing budget constraints;~~
- ~~— Program Expansion: Plans to increase the reach of the HUNCH Program in:
 - ~~○ number of schools and student participants~~
 - ~~○ number and type of new projects offered~~
 - ~~○ support to other NASA Programs (besides ISS);~~~~
- ~~— Acquisition capability: ability to process material purchase requests and travel requests in a timely manner;~~
- ~~— Metrics and activity status reporting to measure and track program activities and reach;~~
- ~~— Labor resources to implement existing HUNCH projects and other program requirements (such as soft goods fabrication, culinary challenge, hardware fabrication, design and prototyping, hardware assembly, video challenge, and industry relations support;~~
- ~~— Coordination with HUNCH civil servant program leadership;~~
- ~~— Establishment/maintenance of good HUNCH mentor/student relationships;~~
- ~~— Financial reporting: ability to maintain accurate financial tracking of expended costs as well as items/services acquired;~~

NASA HUNCH Program Description:

~~Serving the needs of Johnson Space Center (JSC), Marshall Space Flight Center (MSFC), Kennedy Space Center (KSC), Glenn Research Center (GRC), Goddard Space Flight Center (GSFC), and Langley Research Center (LaRC), the NASA HUNCH Program currently supports the creation of flight, training, and communications products through a network of middle and high schools located throughout the United~~

States. HUNCH supports STEM activities in 42 states and over 250 schools. HUNCH provides a vital outreach tool to encourage interest in the STEM disciplines by providing real-world, hands-on projects that the students develop themselves. To date, products developed by HUNCH students come from a range of disciplines including, culinary, soft goods (sewing), design and prototyping, hardware fabrication, communications (video challenge), and software. All requirements are provided by NASA. Typical hardware deliveries currently include single stowage lockers, intravehicular activity (IVA) handrails, extravehicular activity (EVA) wire ties, and various training mockups. Typical soft goods products include cargo transfer bags, crew quarter organizers, and sleep station sleeping bag liners.

Currently, new requirements are submitted to the contractor's HUNCH Lead for evaluation in the form of a HUNCH Request (HR) (although proposers are encouraged to submit alternate means of prospecting for projects and bringing them into the program), then evaluate the project and determine if it is feasible within the given financial resources and school capabilities. If determined to be feasible, it would then be proposed to NASA for approval. The HUNCH Program to date has delivered over 1500 flight items made by high school students for delivery to the International Space Station, as well as support to other NASA programs. Additionally, NASA has utilized other output from these student projects for training of astronauts, communications and outreach, prototyping, and display purposes.

NASA defines the products to be produced by HUNCH participant schools and provides machining and other resources (including materials) required for the schools to support HUNCH activities. HUNCH contractor mentors typically cover an average of twenty-one schools each. HUNCH mentors work with the school to identify a project that their students will be able to complete. The mentor does not instruct students on how to use a piece of equipment, but how NASA would go about making a part or solve a problem. Mentors typically work to provide demonstrations on how to use the tools and equipment and it is expected that the students will continue to work on the project when the mentor is not in the classroom working with the students. NASA manages the process to develop new projects and offerings, with the assistance of the HUNCH contractor, and facilitates communication of needs for assets in underserved communities to government, academia, and industry to secure resources in the form of equipment (CNC machines, industrial sewing machines, software, etc.), all with the goal of introducing needed knowledge and skills required to enter the workforce or to continue within academia with a familiarity of the assets the students will see at the next level of their careers. The ultimate goal is to provide state of the art equipment and supplies to participating schools to ensure students are prepared with the skills required to meet the standards of industry and academia upon completion of their participation in the HUNCH Program. Growth in the numbers of schools and students is expected to be approximately five percent per year.

Specific projects to be supported include:

Culinary. HUNCH hosts a nutritional science competition with the winner flying their food item(s) to the ISS for astronaut/cosmonaut consumption. This project promotes science and technology as it applies to creating nutritional and tasteful food for the on-board crew. High school students from around the United States are given a set of nutritional requirements for an entree or side dish. At the end of the school year, students come to Johnson Space Center (JSC), prepare their dish, and several astronauts and ISS leadership perform a taste testing. After the results are compiled and comments evaluated, a dish is selected. The JSC Food Lab then makes and packages the meal for transport to the ISS.

Communications. This project includes a wide range of products from video production to manufacturing of informative displays in support of the NASA mission.

Soft-goods. This project promotes STEM in the design and fabrication of aerospace soft-goods (products made from fabric). Consumer Science students follow strict quality control procedures required for aerospace soft-good manufacturing while producing spaceflight and training products.

Design and Prototyping. This project promotes every aspect of STEM. HUNCH schools receive real-world projects either from astronauts or from other ISS program offices. The purpose is to analyze an idea and create possible solutions. A design and prototyping fair is held twice a year with the astronaut office to provide one-on-one interaction with the students. Each year items are chosen to move forward for fabrication to ultimately be utilized onboard the ISS.

Hardware Fabrication. Students acquire skills operating computer numerically controlled (CNC) machining capability to machine parts out of billets of raw material. The project requires leading-edge equipment and supporting expertise to produce flight and training hardware as defined by NASA to be used in ground training and on-board the ISS. Ensuring that schools possess equipment meeting current industry standards is required to ensure quality of product and quality of training for participating students.

Currently, school counts for each discipline are as follows:

- Soft-goods: 20 schools
- Culinary: 82 schools
- Design and Prototype: 66 schools
- Video Challenge: 29 schools
- Hardware Fabrication: 54 schools
- Hardware Fabrication through partnership with the Society of Manufacturing Engineers: 26 (Minimal required interaction from HUNCH contractor mentors)
- Industry Relations Specialist: 1 mentor (see HUNCH Attachment C: Current Contractor Staffing)

Respondents will not receive funding from NASA to develop the white papers or proposals.

The following due dates will apply to this Focus Area only:

- White papers due November 27, 2020
- Proposals due February 26, 2021

HUNCH Focus Area Clarifications:

- The HUNCH administrator roles outlined in this Focus Area have an annual budget of approximately \$3.0M (including annual travel of approximately \$50K), with an additional annual budget for purchase of materials of approximately \$.1M, for a total of approximately \$3.1M annually.
- The HUNCH Mentors located at the following NASA Field Centers are civil servants, thus no contractor personnel are necessary at these Centers: GSFC, GRC, LaRC, and KSC. The Mentors located at JSC and MSFC are not civil servants, thus would be included with the support required under this Focus Area.
- Each Mentor is assigned to schools located in proximity to their NASA Center, so most travel is commuting on a regular basis to their schools and does not require air travel.
- Mentors are expected to be experienced professionals (journeymen in their respective disciplines), capable of training the teachers who instruct the students at each school, teaching them how NASA

~~performs quality control and safety reviews, and perhaps demonstrating how things like different machining steps should be performed. Additionally, the Mentors maintain regular communications with each of their schools to ensure adequate progress is being made on their projects.~~

- ~~— Office space for all of the contractor support located at JSC and MSFC is provided onsite and on a non-reimbursement basis by NASA.~~
- ~~— Existing HUNCH projects will be provided by NASA and managed by the HUNCH contractor, however new projects may be proposed in any of the disciplines by the contractor to NASA.~~
- ~~— The HUNCH website is maintained by the HUNCH contractor.~~
- ~~— Transition plan for continuity of ongoing HUNCH projects will be reviewed as part of the proposal evaluation criteria.~~
- ~~— HUNCH Attachment C—Current Contractor Staffing, has been modified to clarify which contractor personnel are considered “Mentors”.~~
- ~~— Start date of the new contract will be the end of the Spring, 2021 school semester approximately June 1, 2021) or upon signing of a new contract, whichever is later.~~

C. ISS Integration Requirements

Experiments, concepts, and/or hardware must fit within the mass and volume constraints of existing ISS launch vehicles and must adhere to ISS integration requirements. Experiments and/or hardware can be launched pressurized or unpressurized. Unpressurized payloads must attach to the ISS using a Flight Releasable Attachment Mechanism (FRAM), Payload Interface Unit (PIU), or Columbus External Payload Adapter (CEPA).

D. References to Unique NASA Capabilities

NASA’s HEOMD uses a variety of specialized test and high-end computational facilities to achieve its mission. Any need for these specific facilities for the proposed research must be explicitly described in the proposal, including the asset, rationale and justification of the need, how it supports the investigation, and when during the proposed period the resource will be required. As evaluation panels review the intrinsic merit of the proposed investigation, they will be asked to consider the realism and reasonableness of the request for unique NASA capabilities and whether it is an appropriate utilization of a highly constrained asset. Proposals selected for funding will be considered for an allocation of the requested NASA resources needed for their investigation, but availability of the resource to support the fully requested level cannot be guaranteed.

E. NASA Safety Policy

Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment. NASA’s safety priority is to protect the following: (1) the public, (2) astronauts and pilots, (3) the NASA workforce (including employees working under NASA award instruments), and (4) high-value equipment and property. All research conducted under NASA auspices shall conform to this philosophy.

F. Availability of Funds for Award

Prospective proposers to this NRA are advised that funds are not currently available for awards under this NRA. The Government’s ability to make award(s) is contingent upon the availability of appropriated funds from which payment can be made and the receipt of proposals that NASA determines acceptable for award under this NRA. Successful proposals will have launch and integration costs covered by NASA. Successful proposals may also be eligible for additional funding, subject to the type of award that is offered. Proposals must indicate if NASA funding is requested.

G. Additional Funding Restrictions

The construction of facilities is prohibited unless specifically required in this announcement. For further information on allowable costs, refer to the cost principles cited in the *NASA Federal Acquisition Regulations (FAR) Supplement Provision* and the *Guidebook for Proposers*. (References in Section VIII.)

Travel, including foreign travel, is allowed, as may be necessary, for the meaningful completion of the proposed investigation, as well as for publicizing its results at an appropriate professional meeting.

NASA does not allow for payment of profit or fee to commercial firms under grant awards.

H. Guidebook for Proposers Responding to a NASA Research Announcement (NRA) or Cooperative Agreements Notice (CAN)

All policies and procedures for the preparation and submission of proposals, as well as NASA's review and selection of proposals for funding, are presented in a separate document entitled *Guidebook for Proposers Responding to a NASA Research Announcement (NRA) or Cooperative Agreements Notice (CAN)* (Guidebook) that is located at <https://www.hq.nasa.gov/office/procurement/nraguidebook/>.

By reference, the newest edition of this Guidebook (March 2018) is hereby incorporated into this NRA, and proposers to this NRA are responsible for understanding and complying with its procedures before preparing and submitting their proposals. Proposals that do not conform to its standards may be declared noncompliant and returned without review.

The other chapters and appendices of this Guidebook provide supplemental information about the entire NRA process, including NASA policies for the solicitation of proposals; guidelines for writing complete and effective proposals; the NASA policies and procedures for the review and selection of proposals; as well as for issuing and managing the awards to the institutions that submitted selected proposals; and Frequently Asked Questions about a variety of the NASA proposal and award processes and procedures. Note that the NASA policy for proposals involving non-U.S. participants is given in section (I) of Appendix B of this Guidebook.

Comments and suggestions of any nature about this Guidebook are encouraged and welcomed and may be directed to Sponsored Research Business Activity (SRBA) group of the NASA Office of Procurement, NASA Headquarters, 300 E Street SW, Washington, DC 20546-0001; e-mail: SRBA@nasa.gov. SRBA's URL is http://prod.nais.nasa.gov/pub/pub_library/srba/poc.html.

II. Award Information

Awards made pursuant to this NRA will be in the form of grants, cooperative agreements, contracts, and intra- or interagency transfers, depending on the nature of the submitting organization and/or the specific requirements for awards given in each program element description. The type of award offered to selected proposers will generally follow the policies in Section D.1 of the *NASA Guidebook for Proposers*. A NASA awards officer will determine the appropriate award instrument for the selections resulting from this solicitation.

NASA may also enter into "other transactions" as authorized by 51 USC 20113(e) and its implementing guidance.

Grants and cooperative agreements will be subject to the provisions of the *NASA Grants and Cooperative Agreement Handbook*, hereafter referred to as the *Grants Handbook* (https://prod.nais.nasa.gov/pub/pub_library/grcover.htm) and Appendix D of the *NASA Guidebook for Proposers*. In the case of any conflict, the *Grants Handbook* takes precedence. Contract awards will be subject to the provisions of the Federal Acquisition Regulations (FAR) and the NASA FAR Supplement <https://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>.

Successor proposals, defined as proposals for renewal or supplementation of existing projects, are eligible to compete with proposals for new awards. Please reference the *NASA Guidebook for Proposers* Section 1.5 for policies relating to such successor proposals.

NASA does not provide separate funding for direct and indirect costs; thus, the amount of the award requested is the total of all costs submitted in the proposed budget.

III. Eligibility Information

A. Eligibility of Applicants

Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, and nonprofit institutions. Historically Black Colleges and Universities, other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply.

In all such arrangements, the proposing entity is expected to be responsible for administering the project according to the management approach presented in the proposal. The proposing entity must have in place a documented base of ongoing high-quality research in science and technology, or in those areas of science and engineering clearly relevant to the specific programmatic objectives and research emphases indicated in this NRA. Present or prior NASA support of research or training in any institution or for any investigator is not a prerequisite to submission of a proposal or a competing factor in the selection process.

B. Guidelines for International Participation

Foreign entities are not eligible for funding under this NASA Research Announcement and should propose to participate on a no-exchange-of-funds basis. NASA funding cannot be used for subcontracted research efforts, such as Technology Demonstration, to non-U.S. entities. The direct purchase of supplies and/or services, which do not constitute research, from non-U.S. sources by U.S. award recipients is permitted. A proposal submitted by a non-U.S. organization, or proposing that research will be performed by a non-U.S. organization as part of a proposal submitted by a U.S. organization, should certify that a sponsoring foreign government agency or foreign institution commits to bear the cost of the research proposed to be performed by the non-U.S. organization. See the NRA Guidebook, Section 1.6.1 for further details.

<https://www.hq.nasa.gov/office/procurement/nraguidebook/>

Assurance of Compliance – China Funding Restriction - (DEVIATION FEB 2012)

(iv) An Assurance of Compliance with The Department of Defense and Full-Year Appropriation Act, Public Law 112-10 Section 1340(a); The Consolidated and Further Continuing Appropriation Act of 2012, Public

Law 112-55, Section 539; and future-year appropriations herein after referred to as "the Acts", whereas:

- 1) NASA is restricted from using funds appropriated in the Acts to enter into or fund any grant or cooperative agreement of any kind to participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level and at all subrecipient levels, whether the bilateral involvement is funded or performed under a no-exchange of funds arrangement.
- 2) Definition: "China or Chinese-owned Company" means the People's Republic of China, any company owned by the People's Republic of China, or any company incorporated under the laws of the People's Republic of China.
- 3) The restrictions in the Acts do not apply to commercial items of supply needed to perform a grant or cooperative agreement.
- 4) By submission of its proposal, the proposer represents that the proposer is not China or a Chinese-owned company, and that the proposer will not participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level or at any subrecipient level, whether the bilateral involvement is funded or performed under a no-exchange of funds arrangement.

C. Cost Sharing or Matching

Cost sharing is not required for contract awards except as provided in NASA FAR Supplement (NFS) 1816.303-70 for awards resulting from unsolicited proposals for research submitted by commercial organizations. NFS 1816.303-70 is located at

<https://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>.

For an institution of higher education, hospital, or other non-profit organization seeking to receive a grant or cooperative agreement, cost sharing is not required; however, NASA can accept cost sharing if it is voluntarily offered. For those recipients, Section B, Provision & Section 1260.123 of the *NASA Grant and Cooperative Agreement Handbook*, entitled "Cost sharing or matching," located at

http://prod.nais.nasa.gov/pub/pub_library/grantb.html#1260.123, describes the acceptable forms of cost sharing.

For a commercial organization seeking to receive a grant or cooperative agreement, cost sharing is required, unless the commercial organization can demonstrate that they will not receive substantial compensating benefits for performance of the work. If no substantial compensating benefits will be received, then cost sharing is not required, but can be accepted. Section B, Provision 1260.123, "Cost sharing or matching," and the special conditions at section A, subpart 1260.4(b) describes cost sharing and allowability for awards with commercial firms that do not require cost sharing. Section D, Provision & Section 1274.204, "Cost and payments," located at http://prod.nais.nasa.gov/pub/pub_library/grantd.html#1274204 of the *NASA Grant and Cooperative Agreement Handbook* describes the acceptable forms of cost sharing for commercial organizations.

IV. White Paper, Proposal and Submission Information

A. Address to Request Proposal Package

All information needed to respond to this solicitation is contained in this NRA and in the companion document entitled *Guidebook for Proposers Responding to a NASA Research Announcement (NRA) or Cooperative Agreement Notice (CAN)* (hereafter referred to as the *Guidebook for Proposers*) that is located at: <http://www.hq.nasa.gov/office/procurement/nraguidebook/>.

Additionally, applicants shall prepare proposals in accordance with NFS 1852.235-72 (JUL 2016), Instructions for Responding to NASA Research Announcements, hereafter referred to as the NASA FAR Supplement Provision, which is located at: <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>.

The information in this NRA supersedes and provides additional direction to that found in the *Guidebook for Proposers* the NASA FAR Supplement Provision. At NASA's discretion, Proposals that do not conform to these standards may be declared noncompliant and declined without review.

Generic white paper and proposal submission questions received will be answered and published in a Frequently Asked Questions (FAQ) document. This FAQ will be posted on the NSPIRES solicitation download site alongside this NRA and will be updated periodically between submission releases.

B. Content and Form of Proposal Submission

1. Electronic White Paper and Proposal Submission

All white papers and proposals submitted in response to this NRA must be submitted in a fully electronic form. No hard copy of the white paper or proposal will be accepted. **Electronic white papers and proposals must be submitted by one of the officials at the proposal PI's organization who is authorized to make such submission;** electronic submission by the authorized organization representative (AOR) serves for the proposal as the required original signature by an authorized official of the proposing organization. All team members must be registered in NSPIRES and confirm their organizational affiliation when added to a proposal before the PI organization official can submit.

Proposers can use either NSPIRES (<http://nspires.nasaprs.com>) or Grants.gov (<http://www.grants.gov>) for white paper and proposal submission. All proposers, team members, and agency officials must be registered before submission with NSPIRES regardless of the electronic system used to submit white papers and proposals. Proposers are discouraged from submitting the same proposal to both electronic submission systems. NASA plans to use the NSPIRES system to facilitate the review process so all proposals received through Grants.gov will be transferred into NSPIRES.

Every organization that intends to submit a white paper or proposal to NASA in response to this NRA, including educational institutions, industry, nonprofit institutions must be registered in NSPIRES. This applies equally for white papers and proposals submitted via Grants.gov, as well as for white papers and proposals submitted via NSPIRES. Such registration must be performed by an organization's electronic business point-of-contact (EBPOC) in the Central Contractor Registry (CCR).

Any organization requesting NASA funds through the proposed investigation must be listed on the Proposal Cover Page. NASA will not fund organizations that do not appear on the Proposal Cover Page. Each individual team member (e.g., PI, co-investigators, etc.), including all personnel named on the proposal's cover page, must be individually registered in NSPIRES. This applies equally for proposals submitted via Grants.gov, as well as for proposals submitted via NSPIRES.

Each individual team member (e.g., PI, co-investigators, etc.), including all personnel named on the proposal's electronic cover page, must specify an organizational affiliation. The organizational affiliation specified must be the organization through which the team member is participating in the proposed investigation. If the individual has multiple affiliations, then this organization may be different from the

individual's primary employer or preferred mailing address.

Generically, an electronic proposal consists of one or more electronic forms, including an electronic cover page and one or more attachments. The attachments contain all sections of the white paper or proposal, including the science/technical/management section, as well as all required and allowed appendices; see Sections IV(b)(2) and (3) below for further requirements.

Submission of electronic proposals via either NSPIRES or Grants.gov requires several coordinated actions from the proposing organization. In particular, when the PI has completed entry of the data requested in the required electronic forms and attachment of the allowed PDF attachments, including the science/technical/management section, an official at the PI's organization who is authorized to make such a submission, referred to as the AOR, must submit the electronic proposal (forms plus attachments). Coordination between the PI and his/her AOR on the final editing and submission of the proposal materials is facilitated through their respective accounts in NSPIRES and/or Grants.gov. Note that if one individual is acting in both the PI and AOR roles, he/she must ensure that all steps in the process are taken, including submitting the proposal from the organization.

Requests for assistance in accessing and/or using this website may be directed by e-mail to nspires-help@nasaprs.com or by telephone to (202) 479-9376 Monday through Friday, 8:00 AM – 5:00 PM Eastern Time. Frequently Asked Questions (FAQs) may be accessed through the Proposal Online Help site at <http://nspires.nasaprs.com/external/help.do>. Tutorials of NSPIRES are available at <http://nspires.nasaprs.com/tutorials/index.html>.

2. White Paper and Proposal Submission Information

Submission of a white paper is recommended in advance of a full proposal. The NASA POC may contact you via written letter or email to further clarify the aspects of the idea in the white paper. This procedure is intended to minimize unnecessary effort in proposal preparation and review. White papers and proposals may be submitted at any time prior to the date and time specified in Section IV.C. NASA will acknowledge receipt of all submissions and assign a control number that should be used in all further correspondence regarding these submissions.

NASA will respond to white papers with a letter encouraging or discouraging the submission of a full proposal based on the proposed effort's relevance to the ISS Utilization mission and a preliminary assessment of the scientific or technical merit of the concept.

All full proposals deemed acceptable under the evaluation criterion "Relevance to ISS Utilization Mission," will be reviewed using the evaluation criteria and without regard to any comments resulting from the review of a white paper.

White papers will be reviewed upon submittal; proposals may be submitted following NASA response to white paper submission. The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be combined into a single proposal.

3. Proposal Format and Contents

All proposals submitted in response to this NRA must include the appropriate required electronic forms available through either of the two proposal submission systems, NSPIRES or Grants.gov.

The science/technical/management section and other required sections of the proposal must be submitted as searchable, unlocked PDF files that are attached to the electronic submission using one of the proposal submission systems. Proposers must comply with any format requirements specified in this NRA and in the *NASA Guidebook for Proposers* (e.g. Section 2.3 of the *NASA Guidebook for Proposers*). Only appendices/attachments that are specifically requested in either this NRA or in the *NASA Guidebook for Proposers* will be permitted; proposals containing unsolicited appendices/attachments may be declared noncompliant. Section 2 of the *NASA Guidebook for Proposers* provides detailed discussions of the content and organization of proposals suitable for all program elements in this NRA, as well as the default page limits of a proposal's constituent parts.

1. White Paper Format

White paper submissions are recommended in advance of full proposals in order to provide potential proposers with a rapid response to minimize unnecessary effort. White papers should follow the format below. The cover sheet should be clearly marked "WHITE PAPER" and the total length shall not exceed 6 pages, excluding cover page and official transmittal letter. A page is defined as being no larger than electronically formatted page of 8.5" by 11.0" with type not smaller than 12 point. Smaller font may be used for figures, tables and charts. No official transmittal letter is required. All white papers must be written in English.

Section I. Administrative {not included in the page count}

A. Cover sheet to include:

- 1) NRA number (NNJ13ZBG001N)
- 2) Focus Area (Technology Demonstration, National Lab)
- 3) Proposal title
- 4) Lead Organization submitting proposal
- 5) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT"
- 6) Contractor's reference number (if any)
- 7) Other team members (if applicable) and type of business for each
- 8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
- 9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available),
- 10) Total funds requested from NASA, and the amount of cost share (if any) AND
- 11) Date proposal was submitted.

B. Official transmittal letter (not required).

Section II. Summary of Proposal {6}

- A. **Innovation.** Succinctly describe the uniqueness and benefits of the proposed investigation relative to the current state-of-art or alternate approaches.
- B. **Results.** Provide a short description of the results, products, or process that may be expected at the end of the investigation.
- C. **Technical Rationale.** Provide a short description of the impact of the proposed development on NASA missions or objectives.
- D. **Technical Approach.** Provide a short description of the technical approach and constructive plan for accomplishment of technical goals in support of claims and deliverable production.

- E. **Experience.** Provide a short general discussion of other research by corporate team members in the proposed technology area.
- F. **Risk.** Provide a short description of the unique challenges that this Proposal may experience in meeting NASA Safety Policy (See Section E).
- G. **Cost.** Provide rationale for the proposal cost and duration.

2. Proposal Format

The proposal format should follow the guidelines in the NASA Guidebook for Proposers. In addition to the requirements in the guidebook, the proposer should include specific requirements for mass, volume, power, and data from the ISS.

C. Funding Restrictions

Allowable costs for contract awards are covered in Part 31 of the FAR, located at <http://www.acquisition.gov/far/current/html/FARTOCP31.html#wp253693> and Part 31 of the NASA Far Supplement, located at <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>. Pre-contract costs are covered in FAR 31.109, located at NFS 1831.205-32 and NFS 1852.231-70.

Allowable costs for grant and cooperative agreement awards with universities, hospitals, and other nonprofit organization and awards with commercial organizations that do not involve cost sharing are covered in Provision & Section 1260.127 of the *NASA Grant and Cooperative Agreement Handbook*, located at http://prod.nais.nasa.gov/pub/pub_library/grantb.html#1260.127. Pre-award costs are covered in Provision & Section 1260.125, located at http://prod.nais.nasa.gov/pub/pub_library/grantb.html#1260.125.

Allowable costs for grant and cooperative agreement awards with commercial firms involving cost sharing are covered in Provision & Section 1274.204 of the *NASA Grant and Cooperative Agreement Handbook*, located at http://prod.nais.nasa.gov/pub/pub_library/grantd.html#1274204. Pre-award costs are covered in FAR 31.109, located at http://www.acquisition.gov/far/current/html/Subpart%2031_1.html#wp1089616, and with NFS 1831.205-70, located at <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>.

V. Proposal Review Information

A. Evaluation Criteria

White papers and proposals will be evaluated against the following criteria:

- A. The proposal shows a clear need for the use of the ISS and its unique capabilities – compliance check only (i.e. pass/fail).
- B. The proposal demonstrates relevance to the ISS utilization focus areas, commercialization of LEO or research emphases – compliance check only (i.e. pass/fail).
- C. The proposed concept is technically feasible
- D. Technology demonstration investigation proposals must clearly document why the demonstration is necessary to develop exploration enabling technologies that support the advancement, or enable the development, of a system or capability. This will include, but is not limited to, how the demonstration may advance the state of the art with respect to the following criteria:
 - 1) reduced mass
 - 2) reduced volume
 - 3) reduced power requirements

- 4) reduced maintenance and logistics
 - 5) increased efficiency
 - 6) increased reliability
 - 7) improved safety
- E. Commercial space utilization proposals will clearly demonstrate a viable business case including, but not limited to, the following:
 - 1) commercial market forecast
 - 2) capitalization
 - 3) approach to marketing
 - 4) plans for business development
- F. ISS Integration and Operations Impact - ISS integration and operations impact is acceptable given interface requirements for, but not limited to:
 - 1) power
 - 2) thermal
 - 3) data
 - 4) location
 - 5) crew time
 - 6) timing of delivery/execution
 - 7) safety assessment
 - 8) GFE/GFD
 - 9) other resources as applicable
- G. Intrinsic merit - Evaluation of the intrinsic merit of the proposal includes consideration of the following factors:
 - 1) overall scientific, commercial or technical merit of the proposal
 - 2) unique and innovative methods, approaches, concepts, or advanced technologies outlined
 - 3) offeror's corporate capabilities, past performance, facilities and other infrastructure, processes, or unique combination of these which are integral factors for achieving the proposal's objectives
 - 4) qualifications, capabilities, and experience of:
 - i. proposed principal investigator
 - ii. team leader
 - iii. key personnel
- H. Cost Realism - Evaluation of the cost realism of the proposal includes consideration of the following factors:
 - 1) reasonableness and manageability of project costs given the complexity of the project
 - 2) reasonableness of total cost to NASA to enable the capability/service including upmass, crew time, integration, stowage, etc.
 - 3) reasonableness of proposed cost to NASA for government use of the capability/service
- I. Schedule Realism - Evaluation of the schedule realism of the proposal includes consideration of the following factors
 - 1) realism of schedule
 - 2) inclusion of appropriate milestones to ensure successful completion of the project within the proposed timeframe

B. Review and Selection Process

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. Award(s) may be made to any proposer(s) whose proposal(s) is determined selectable regardless of its overall rating.

NASA's policy is to ensure impartial, equitable, and comprehensive evaluation of all proposals and to select the source(s) whose offer(s) best meet(s) the Government's technical, policy, and programmatic goals in accordance with the evaluation criteria contained in this NRA. Pursuant to NASA FAR 1835.016 and FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide this evaluation, cognizant personnel will review each submission and will convene panels of experts in the appropriate areas when necessary. The results of these reviews will be documented in the form of recommendations and will be provided to the manager of the NASA ISS Research Integration Office. These recommendations will indicate those proposers with whom negotiations or discussions will be conducted. They will also include questions arising from the reviews and, when appropriate, issues that need to be resolved prior to making awards.

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement, except in the case where proposals are submitted to same Specific Focus Area (as opposed to a Generic Focus Area). NASA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in "Proposal Format and Content", Section IV.B.3 of this announcement. Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and are not considered part of the proposal. All proposals must first be deemed relevant to ISS and likely to contribute to the mission as described in paragraphs I.B. "Overview of ISS Utilization Focus Areas" and I.C. "Research Emphases Specific to this Solicitation".

Restrictive notices notwithstanding, proposals may be handled for administrative purposes by support contractors. These support contractors are bound by appropriate non-disclosure requirements.

Subject to the restrictions set forth in FAR 37.203(d) and NASA FAR 1837.204, input on technical aspects of the proposals may be solicited by NASA from non-Government consultants /experts who are strictly bound by the appropriate non-disclosure requirements.

It is the policy of NASA to treat all proposals as competitive information and to disclose their contents only for the purpose of evaluation. No proposals will be returned. After proposals have been evaluated and selections made, the original of each proposal will be handled in accordance with NASA record retention policy.

VI. Award Administration Information

A. Award Notices

At the end of the selection process, each proposing organization will be notified of its selection or non-selection status. NASA will provide debriefings to those investigators who request one. Selection notification will be made by a letter signed by the designated NASA selecting official. The selection letters are not an authorization to begin performance. The selected organization's business office will be contacted by a NASA Contracting Officer to negotiate an award. Any costs incurred by the investigator in anticipation of an award are at their own risk until contacted by NASA. The NASA Contracting Officer will determine the type of award instrument, request further business data, and negotiate the resultant action. NASA Contracting Officers are the only personnel with the authority to make award and obligate Government funds. NASA reserves the right to offer selection of only a portion of a proposal. In these instances, the investigator will be given the opportunity to accept or decline the offer. Additional information can be referenced in paragraph (d) of NFS 1835.016-71, located at <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>, and in Appendix D of the *Guidebook*.

B. Administrative and National Policy Requirements

Grant and cooperative agreement awards are subject to the NASA Grant and Cooperative Agreement Handbook. This handbook consists of four sections that prescribe the policies and procedures relating to the award and administration of NASA grants. Section A provides the text of provisions and special conditions and addresses NASA's authority, definitions, applicability, amendments, publications, deviations, pre-award requirements and post-award requirements currently covered by 14 CFR part 1260. Section B relates to grants with institutions of higher education, hospitals, and other nonprofit organizations. Sections A and B, with the special considerations in subpart 1260.4(b), apply to awards with commercial firms that do not involve cost sharing. Section C adopts the administrative requirements of OMB Circular No. A-102 and relates to administrative requirements for grants to state and local governments. Section D relates to awards with commercial firms. The Handbook is located at https://prod.nais.nasa.gov/pub/pub_library/grcover.htm. Contract awards are subject to the FAR and NASA FAR Supplement, located at <http://www.acquisition.gov/far/> and <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>, respectively. Applicants are advised that contract awards are subject to the subcontracting requirements of FAR and NFS Part 19. The NASA Contracting Officer will choose the appropriate award instrument.

C. Program Reporting/Individual Researcher Reporting

Required reports for contract awards will be negotiated with the contractor, subject to the terms and conditions of the FAR and NASA FAR Supplement, located at <http://www.acquisition.gov/far/> and <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>, respectively. Required reports for grants and cooperative agreements are covered in Exhibit G, "Required Reports and Publications" of the NASA Grant and Cooperative Agreement Handbook. Required reports for Federal Demonstration Partnership (FDP) grant awards are covered in Exhibit H, "Federal Demonstration Partnership – Required Publications and Reports." The Handbook is located at http://prod.nais.nasa.gov/pub/pub_library/grcover.htm.

VII. Contacts

Additional technical information for this NRA is available from:

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Additional contracting information for this NRA is available from:

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VIII. Other Information

A. Proprietary Information

All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the Proposer's responsibility to clearly define to the Government what is considered proprietary data. Additional information can be referenced in Appendix D of the Guidebook.

B. General References

Guidebook for Proposers Responding to a NASA Research Announcement (NRA) is available online at the following address:

<http://www.hq.nasa.gov/office/procurement/nraguidebook/>

NASA Federal Acquisition Regulations Supplement Instructions for Responding to NASA Research Announcements (Provision NFS 1852.235-72) is available online at the following address:

<https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>

Standard Format for NASA Research Announcements (NRAs) and other Announcements for Grants and Cooperative Agreements. This document is available online at the following address:

https://nodis3.gsfc.nasa.gov/displayAll.cfm?Internal_ID=N_PR_5810_001A_&page_name=ALL

NASA Grant and Cooperative Agreement Handbook. This document is available online at the following address: https://prod.nais.nasa.gov/pub/pub_library/grcover.htm

International Space Station Facilities and Accommodations Overview. This information is available online at the following address:

https://www.nasa.gov/mission_pages/station/research/facilities/index.html

External Payloads Proposer's Guide to the International Space Station This document is available online at the following address:

https://www.nasa.gov/mission_pages/station/research/facilities_external_payloads_proposer_guide

Reference Guide to the International Space Station. This document is available online at the following address:

<https://www.nasa.gov/sites/default/files/atoms/files/np-2015-05-022-jsc-iss-guide-2015-update-111015-508c.pdf>