



ISS NATIONAL LABORATORY®

CENTER FOR THE ADVANCEMENT OF SCIENCE IN SPACE®

**PREPARATION INSTRUCTIONS AND EVALUATION OVERVIEW
FOR TECHNOLOGY DEVELOPMENT/DEMONSTRATION PROPOSALS**

Center for the Advancement of Science in Space

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1 PREFACE

Since 2000, the International Space Station (ISS) has enabled humans to live and work in space, supporting research and technology development that is not possible anywhere on Earth. Since its designation in 2005, the ISS National Laboratory® has expanded access to this orbiting laboratory to research communities from U.S. academic institutions, government agencies, and the private sector. ISS National Lab-sponsored research seeks scientific discovery and technology advancement on the ISS that directly benefits humanity by increasing fundamental knowledge, scientific application, education outreach, workforce development, and demand creation for sustainable, scalable innovation and production in low Earth orbit (LEO).

As managers of this national laboratory in partnership with NASA, the Center for the Advancement of Science in Space (CASIS) awards access to funding and resources on the ISS via competitive grant solicitations to support non-exploration science and technology development as well as science, technology, engineering, and mathematics (STEM) education initiatives from U.S.-based institutions.

As a U.S. taxpayer-funded organization, CASIS only contracts with U.S. persons¹. Submitted proposals must be compliant with all U.S. Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR). This document will assist offerors in the development of concepts and proposals to leverage the ISS National Lab for applied research and technology development and demonstration. Failure to comply with these instructions will result in a less than optimal rating for the offeror's proposal and may result in disqualification from review.

2 PROPOSAL PREPARATION AND CONTENT

The objective of the CASIS proposal submission and evaluation process is to solicit and identify, in a clear and transparent manner, proposals that demonstrate an appropriate and effective application and use of the ISS National Lab, a publicly funded asset with unique capabilities, resources, and limited capacity. To make this determination on the many and diverse types of proposals received, these instructions are provided to each proposing entity to guide their development of a proposal that clearly defines a technology development goal, experimental design, execution plan, and support requirements.

Proposals are evaluated along four “lines of business,” which are strategic focus areas of the ISS National Lab: 1) fundamental science, 2) in-space production applications, 3) STEM education and workforce development, and 4) technology development/demonstration. These instructions are for the technology development/demonstration line of business for applied research and development (R&D), technology demonstration, and technology readiness level (TRL) maturation, to improve products and/or processes that will produce positive economic impact. All projects with an expressed commercial purpose or intent are included.

¹ U.S. person: a natural person who is a lawful permanent resident as defined in 8 U.S.C. 1101(a)(20) or who is a protected individual as defined by 8 U.S.C. 1324b(a)(3). It also means any corporation, business association, partnership, society, trust, or any other entity, organization, or group that is incorporated to do business in the U.S. It also includes any governmental (federal, state, or local) entity.

Full proposals shall contain five sections: cover page, abstract, technical section, budget (cost) section, and appendices. Each section is described in detail in this instruction guide. The proposal shall be submitted as one document unless noted “as attached file” (see Appendix A).

Proposals shall be prepared in accordance with the following:

- Proposals must be single-spaced, with no less than 0.75" margins and 11-point Arial or Calibri typeface (black type only).
- Number all pages of the proposal consecutively. The cover page should not be numbered. The budget section should begin at the top of its own page following the technical section.
- The technical section should address the response elements in Section 2.3 of these instructions. The budget section of the proposal should follow the guidance in Section 2.4 of these instructions. If any sections are not included or “response elements” are not discussed, the proposal may be deemed non-responsive and ineligible for consideration.
- Avoid using columns in text. Proposals may include graphics, which must fit within the designated page limits except as noted.
- A table of contents, introduction, executive summary, or any other elements not prescribed by this guidance are neither required nor desired.
- Spreadsheets containing calculations, such as the project budget, must be submitted in the same file format as the template, (i.e., Microsoft Excel).
 - Paste a copy of the “Budget Summary” tab from the completed excel budget file into section 2.4 of the proposal.
- Except where noted, submit the proposal and all text attachments in a single Portable Document Format (PDF) when prompted during the online proposal submission process. Adobe Acrobat no longer supports Flash Player. Offerors should ensure they are using a current version of Adobe Acrobat to create their PDF and that uploaded documents do not include Flash Content. The only documents that should be submitted as separate documents are as follows:
 - The completed budget in the excel file should be submitted as a separate document along with the PDF proposal copy when prompted during the online proposal submission process.
 - PI Profile and Certifications Compliance Form should be submitted as a separate document when prompted during the online proposal submission process.
 - If applicable, the Co-PI Profile and Certifications Compliance Form(s) should be submitted as separate document(s) when prompted during the online proposal submission process.

Proposals should be submitted by a principal investigator (PI) or an authorized official of the proposing organization. Any individual business entity or institution capable of executing the proposed research may submit a proposal. However, CASIS will **ONLY** consider proposals from U.S. persons (business and individual)¹.

2.1 Cover Page (1 page)

The proposal must have the supplied cover page that adheres to the content guidance found in Appendix B. The form is to be completed, in its entirety and signed, by the offeror plus the proposing organization's authorized representative. The cover page is excluded from the page count.

Principal Investigator: Name a single PI, who is a U.S. person that will be responsible to the proposing organization for the scientific and technical direction of the project. While any publications related to the project may credit as many investigators as necessary, one and only one PI must be identified for the purposes of contracting with CASIS. Any identified co-principal investigators must also be U.S. persons.

Signature: The proposal cover page must be signed by an authorized representative of the proposing organization and the PI. In signing, the proposing organization, the authorized representative, and the PI agree that if CASIS accepts the proposal, offerors will be required to agree and accept non-negotiable CASIS terms and conditions. See the contracts section ([Section 4](#)) of these Proposal Instructions for more information on terms and conditions.

Please limit the use of corporate or institutional logos and other identifying marks of the offeror's organization on the cover page.

2.2 Project Abstract (1 page)

The project abstract must contain a summary of the proposed activity suitable for dissemination to the public. This document must not include any proprietary or sensitive business information, as it may be used in ISS National Lab and NASA external communications with the public and media. The project abstract must not exceed 1 page or 400 words. It should be written at an 8th grade reading level. The abstract is not included in the page limitation.

The purpose of the project abstract is to communicate the overall sense of the project, not every step of the work plan or every accomplishment.

The project abstract must include:

- **Statement of the problem or situation that is being addressed in your application.** Describe the technology advancement being addressed—be sure to address the project relevancy to the ISS National Lab mission; why the proposed work requires microgravity, the space environment, or the ISS National Lab's specific vantage point; and if the project builds on prior ISS research.
- **Overall project approach.** A concise summary of the technical approach and a brief description of the tasks and methods (e.g., modeling, ground experiments, or ISS flight experiments).
- **Commercial applications and other benefits.** Summarize anticipated project outcomes and their value. Describe how successful results would contribute to potential future commercial applications and/or public benefits, noting the market size or projected reach. Please cite the sources for any statistics, market size numbers, market value, etc.

2.3 Technical Section (No more than 15 pages)

A detailed description of the technology development/demonstration project to be undertaken shall be submitted as part of the proposal's technical section and contain information addressing four technical subsections outlined below: Scientific and Technical Merit, Implementation Feasibility, Operations/ISS Utilization, and Business and Economic Impact. The technical section of the proposal should be *no more than 15 pages total in length*. Exceeding the page limit may result in evaluators not seeing information on additional pages. It is recommended that proposals be concise and readable, describing the entire technical approach. Proposal evaluators will not research specific details, so please be clear and identify any abbreviated terms. In the appendices (not included in the page count), provide literature citations for any material cited in the technical section of the supporting technical data and related financial/operations and business plans.

The paragraph numbering for the response elements in the following sections align with the proposal evaluation criteria and scoring rubric in the CASIS Proposal Evaluator Instructions and Evaluator Workbook. These documents are available for reference on our website at ISSNationalLab.org or by contacting us via email at PM@issnationallab.org. The response elements can be addressed in any order in the final proposal.

2.3.1 Technical Section I: Scientific and Technical Merit

Scientific and technical merit will be assessed based on the degree to which the project would promote, enable, and facilitate applied research and development, technology demonstration, and technology readiness level (TRL) maturation to improve products or processes that will generate positive economic impact.

Response Elements:

A-1 Clearly defined science/technology question and success criteria addressing expected advancement(s): What science question(s) or technology development goal(s) will be addressed? Research objectives should be specific, addressing measurability and achievability. Each stated research objective should include a detailed, quantifiable success criterion. Summarize the expected relevance of the expected science or technology development outcomes to the long-term goals of the project, including when the outcomes may be achieved. Explain how the project will advance the starting TRL, provide evidence to substantiate the starting and ending TRL, and identify the specific steps needed to affect the envisioned ending TRL. (weight = 0.2)

A-2 Compelling nature and priority of the science or technology objectives: Why is the project of a compelling nature? Are the high-priority science or technology maturation objectives addressed in any industry strategy (e.g., external industry objectives or internal corporate strategy) or national strategy (e.g., government R&D priorities, the National Low Earth Orbit Research and Development Strategy) documents? Does the project align with any U.S. government agency priorities? Letters of support and/or commercial intent are extremely valuable to the merit of the proposal. (weight = 0.1)

A-3 Innovation and novelty of approach: Explain how the project challenges and seeks to shift current science and technology paradigms. Explain the current state of the art and how the proposed science or technology advances this. Provide evidence and quantify the expected advancement. Include sufficient technical detail and background information that the proposal evaluators can sufficiently understand the proposed science or technology, its current state, and its relevance to the proposed research or demonstration. How innovative is the science or technology being demonstrated, and does it involve new concepts, approaches, or implementations to be developed or used or advantages over existing methods and implementations? What “inherent value” does the project have compared with the existing state of the art? Alternatively, the offeror may focus the response to this criterion on how the project relates to internal product and business strategy. (weight = 0.15)

A-4 Programmatic value of proposed project: Describe how the project advances science or technology in the context of ongoing or planned space station research. Referencing related work, does the proposed project leverage prior ISS National Lab-sponsored research? Or does the project extend Earth-based technology to the space station in ways that will be leverageable by future efforts? Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources (e.g., other relevant funding grants and collaborations with industry, academia, or government agencies). Letters of support are encouraged. (weight = 0.1)

A-5 Likelihood of science or technology advancement success: Provide evidence that the proposed project is likely to meet the technology maturation goals and objectives? Are the proposed mission requirements appropriate for guiding development and ensuring success? Is the research or technology maturation itself likely to lead to success? (weight = 0.25)

A-6 Merit of data results/analysis plan: Describe the plan for collecting, analyzing, and interpreting data during the project. Identify what data will be collected and how it will be fully adequate to assess the project’s success. How will the data be analyzed? What characterization or analysis methods will be used? What quantifiable measurements or results are required to meet the proposed research objectives? Does in-process data analysis allow for monitoring during project execution to allow for in-flight adjustments? Does the offeror anticipate publishing and/or presenting project results? Discuss whether project outcomes will be public domain or proprietary. (weight = 0.1)

A-7 Scientific basis and justification for exploitation of microgravity, the extreme environments of space, or the unique vantage point of the ISS: Describe the role and necessity of space-based research in general and ISS-based research specifically. Describe how the project will benefit from the space environment, such as:

- a. Persistent exposure to the LEO environment (e.g., vacuum, atomic oxygen, radiation, debris, or hot/cold cycling)
- b. Persistent microgravity
- c. A specific influence on an organism or material’s behavior
- d. Unique ISS vantage point—remote sensing and aerospace test bed/TRL raising applications.

Identify why the proposed project could not achieve substantively the same scientific or

technical objectives on the ground, via sounding rocket, high-altitude balloon, reduced gravity aircraft testing, computer simulation, or other mechanisms. (weight = 0.1)

2.3.2 Technical Section II: Implementation Feasibility

Implementation feasibility will be assessed based upon the quality and feasibility of the implementation approach, including design and plan for operations, suitability for addressing objectives, management approach, schedule, cost, offeror expertise and prior performance, risk, and if proposing research tools, whether the proposed tools offer advantages compared with the tools currently available for R&D on the ISS.

Response Elements:

- B-1 Adequacy and robustness of the investigation design and plan for operations:* Describe how the proposed implementation design of the project addresses the experiment goals and science objectives. How does the project's success criteria for experimental conduct and operation demonstrate the necessary and sufficient evidence to complete the project? (weight = 0.2)
- B-2 Suitability of proposed hardware, software, and facilities to address objectives:* Describe the flight hardware, software, and facilities, clearly stating the design requirements, critical components, requisites, and verification approach for each. Differentiate between new or existing hardware and clearly define the design, testing, and integration planned for any new or modified hardware required. Outline product development tasks/milestones, including manufacturing requirements. List hardware and software alternatives, where applicable, and relate selection criteria to impact on experiment or technology maturation success. (weight = 0.15)
- B-3 Adequacy and robustness of the management approach and schedule:* Identify the proposed project's key personnel, such as a PI or a project manager (PM). Describe the project's organizational structure. If multiple co-performers are proposed, describe their responsibilities within the project and provide the management plan for coordinating all performers. Provide a timeline of activities (Gantt chart, flow chart, diagrams, etc.) required to successfully execute the preflight, flight, and postflight phases of the project. (weight = 0.15)
- B-4 Well-defined and credible cost of the investigation:* Discuss the basis of the estimate for the proposed project's costs (Note: The budget summary is to be placed in Section 2.4). Identify management reserves, and the philosophy for releasing them. Describe sources of funds to cover those costs. If applicable, include sponsorship or commitment letter(s) supporting the project as an appendix to the proposal. (weight = 0.15)
- B-5 Offeror and Implementation Partner's experience, expertise, and record of performance:* Describe the proposed project team's experience, expertise, and history, including the Implementation Partner. How is the offeror's past performance relevant to the project's proposed science investigation or technology maturation? Does the Implementation Partner (if applicable) have experience with similar ISS flight projects, and does that experience suggest a high likelihood of successful implementation? Define roles and responsibilities of

key performers and/or collaborators. In an appendix to the proposal, provide a biographical sketch for each PI or co-investigator (Co-I) and other key personnel, along with their citizenship status. (weight = 0.1)

B-6 *Uniqueness of implementation relative to ISS R&D tools available to offeror:* Identify how the selected research tools are uniquely capable of achieving the science investigation or technology maturation goals. For example, explain the limitations of currently available ISS solutions and how the proposed implementation hardware uniquely addresses the investigation goals. Note that tool selection (this criterion) is different from justification for use of the ISS (criterion A-7). (weight = 0.15)

B-7 *Implementation risk assessment and mitigation and quality assurance:* Discuss approach to risk management and quality assurance. Identify anticipated implementation risks associated with all relevant project milestones. Based on the offeror's knowledge and experience, describe possible mitigations relative to the project's planned procedures, situations, new/untested hardware, and materials. (weight = 0.1)

2.3.3 Technical Section III: Operations and ISS Utilization

Operations and ISS utilization will be assessed based on the project's detailed description of the facility, flight hardware, and other resources required to execute the defined concept of operations to meet defined science requirements for the payload. The details required to assess readiness for operations and appropriate utilization of scarce ISS resources include power, mass, volume, and interface requirements; installation and operations impact on ISS crew time; hazards; regulatory compliance; data collection and downlink needs; and whether the project offramp or completion criteria are defined and consistent with ISS operations sustainability.

Unless offerors are serving as their own Implementation Partner, they must discuss all aspects of the experiment with their Implementation Partner. Consider the resources and support requirements for proper execution, the time required to operate the experiment, and the overall duration of the experiment in space in order to meet each of the defined science requirements. Provide details unique to the experimental design that someone unfamiliar with the science or the experimental design will need to know to be able to operate or troubleshoot it should the PI not be immediately able to help. Offerors shall submit a Preliminary Experiment Requirements Document (P-ERD) (example format provided in Appendix C, offerors' format is acceptable) to provide additional details related to this section. *Failure to adequately address the operations and ISS utilization response elements below may result in a non-selectable proposal.*

Response Elements:

C-1 *Potential ISS hazards are identified, and control techniques are provided:* Clearly identify potential ISS hazards along with a relevant basis for identification. This criterion includes contribution by the Implementation Partner. Provide potential hazard control activities with known schedule and cost impacts. (weight = 0.1)

C-2 *Installation and operations impact(s) on ISS crew time are defined and sustainable:* Working with the Implementation Partner (where applicable), estimate the crew time required for installation and operation. Provide estimates of these times, substantiated by a basis of

estimate where possible. Crew time estimates can be addressed in a Preliminary Experiment Requirements Document (P-ERD) appendix (see Appendix C). (weight = 0.25)

C-3 Operational status and suitability of support equipment, logistics, and consumables: Identify needed support equipment, ground support equipment (laboratories, test facilities, analysis tools), logistics leading up to flight, and consumables (if relevant). Identify why each item is necessary, particularly if return samples require ground analysis. (weight = 0.15)

C-4 Mass, volume, power, and interface requirements are defined and sustainable: Identify and substantiate launch and return mass and volume, power (ascent, in orbit, descent), and ISS interface requirements. Requirements should be supported by specific basis of estimates where possible. These implementation requirements can be documented in the Preliminary Experiment Requirements Document (P-ERD) (see Appendix C). (weight = 0.2)

C-5 External regulatory policies are identified and addressed: Identify necessary regulatory policies (e.g., biomedical, human tissue, Earth observation, etc.) exclusive of NASA policies and provide plans for regulatory approval. If none apply, provide the rationale. (weight = 0.1)

C-6 Data collection/downlink plan is defined and sustainable: Identify data collection, storage, and data downlink plans, including data volumes and frequency of collection. Describe how they support the objectives of the science investigation or technology maturation. Information can be documented in the Data Management Plan (Section 2.6 Proposal Attachments). (weight = 0.1)

C-7 Completion criteria are defined and consistent with ISS operations: Identify entry and exit criteria that align with the research objectives for project completion. What are the minimum success criteria? Define the minimum required duration in microgravity or the space environment. If applicable, what is the minimum sample size for scientifically significant results to be achieved. Are there continuation and/or early disposal alternatives for project disposition? Minimum success criteria can be documented in the Preliminary Experiment Requirements Document (P-ERD) (see Appendix C). (weight = 0.1)

2.3.4 Technical Section IV: Business and Economic Impact

Business and economic impact will be assessed based on the market potential and application leverage of the proposed project, including market scalability and leveragability, market disruption (competitive differentiation), incremental revenue, financial commitments (including private commitments for matched funding), and whether the project has a feasible product development and commercialization plan and customer engagement strategy, as well as necessary resources to execute on the proposed commercialization strategy.

In addition to describing a specific market and the potential for the product, service, or product improvement, clearly identify the general or specific customers and describe how the product will be delivered to them. Explain how the product or service will impact the customer and why they need it. Elaborate on any follow-on testing and product development needed beyond the initial study to reach full commercialization. Provide estimates on financial and other resource requirements and possible funding sources and strategies to conduct such follow-on R&D and to reach product commercialization.

If funding and/or other resources or value has been committed to the project from an external source, the offeror must identify the specific organization or organizations that have committed the resources and include supporting evidence or documentation. If commercialization of the project is subject to regulatory approvals, outline the current state of the regulatory dialogue and the expected timeline for approvals.

Response Elements:

D-1 Project outcomes can be deployed to serve sizable addressable markets (scalability): Discuss the impact of the solution/product resulting (directly or indirectly) from this project in terms of its Total Addressable Market (TAM)—the overall revenue opportunity that is or is expected to be available to a product or service if 100% market share is achieved. Identify the method of estimation used (e.g., top-down, bottom-up, etc.), the expected value, and any third-party sources used to develop these estimates. (weight = 0.1)

D-2 Ability to leverage project outcomes across multiple applications, customers, or needs: Describe whether (and if so, how) this product/solution development and/or technology maturation is designed with regard to a capability to address **each or some of the following:** multiple applications, needs, customers, and markets. The highest-scoring proposals will be leverageable in several of these dimensions. (weight = 0.1)

D-3 Project results in technology/products/solution innovation and/or market disruption: Describe how the project represents or materially supports a unique innovation that will likely disrupt the targeted markets discussed in D-1. Provide supporting evidence that products or solutions developed as a result of this project will likely gain significant competitive advantage and have high potential to win significant market share. (weight = 0.2)

D-4 Project leads to execution of specific business, regulatory, and product milestones and incremental revenue after completion: Provide specific business, regulatory (if applicable), and product milestones to be met during the project and/or at the completion of the project. Quantify the expectations and provide supporting information (unit volume, pricing, manufacturing yield, throughput, etc.) for estimated incremental revenues resulting from solutions/ products developed as a result of this project, as discussed in criteria D-1 through D-3. Revenue expectations should be stated by expected incremental annual revenues and the time to achieve such revenues (e.g., incremental revenues of \$X/year, achieved in Y years). (weight = 0.2)

D-5 Sufficient internal/partner resource commitment is available: Identify funding required and committed to this project, including external sources of matching funds. Provide supporting evidence or documentation for any matched funding (with a focus on third-party funding commitments). Offerors must include commitment letters detailing the amount and timing of any matched funds from external sources with their proposal. Funding will be considered unavailable unless explicitly documented and supported by commitment letter(s) attached to the proposal. CASIS will separately assess cost realism in criterion B-4. Discuss funding to complete product and manufacturing capability development, commercialize the results of this project, and identify additional quantifiable and committed capital sources (whether internal or partner-provided) to meet this funding need. Additionally, a contingency plan

must be provided, outlining how the project will be funded and executed if committed external capital is not forthcoming within the period of performance of the project. (weight = 0.2)

D-6 *Project has feasible commercialization and customer engagement*: Identify the business and operational management team as well as the entity that will commercialize the results of the proposed project. Ensure the team includes relevant business/product development, operations/manufacturing, and financing expertise. Provide biographical sketches (see Paragraph 2.6 A). Summarize the offeror organization's market validation, customer engagement progress and capabilities, as well as the commercialization strategy. Provide letters of support and/or interest from existing or potential commercialization partners and customers (include in the appendices). This discussion may be supported by including a summary of the financial/operational plan and/or a business plan in the proposal appendices. (weight = 0.2)

2.4 Budget Section (Not included in page count)

The budget template consists of an Excel file with worksheets labeled Instructions, Budget Summary, Project Costs Paid by ISSNL, Project Costs Not Paid by ISSNL, and Glossary. Offerors may modify this file, as needed and with appropriate notation, to include additional cost elements, years, worksheets, etc. ***The Excel file must be completed and submitted with the final proposal.*** In addition, offerors must provide a copy (or link) of the budget summary table from the template in the Budget section of the proposal. For competitive ISS National Lab Research Announcements, the budget template will be available on the solicitation webpage.

The budget is an estimate of the total resources necessary to achieve the desired goals and objectives, applications, or impacts for the funded life of the project. CASIS requires sufficient detail in the budget and schedule to determine adequacy of preflight development and testing resources, time to flight, and time to complete the project. CASIS requires details regarding the project's development costs and the sources of funds to cover those costs to verify that the proposal has adequate resources committed to the project.

Please note: The Instructions worksheet in the Excel Budget Template details federal thresholds, as established under Title 2 of the Code of Federal Regulations (2 CFR) Part 200. Under the latest 2024 revisions to 2 CFR, several thresholds have changed. For instance, items classified as "equipment" must now have a minimum per-unit cost of \$10,000, and supplies with a cumulative residual value of more than \$10,000 must be evaluated for government cost-share reimbursement. Subaward thresholds and the de minimis indirect cost rate have also been updated. If any proposed items exceed these thresholds, offerors must provide a justification in their proposal submission. For further details and exceptions, please refer to [2 CFR Part 200](#).

If the budget includes funding from sources other than the offeror's organization or CASIS (i.e., third-party funding), the offeror MUST include letters of commitment from the third party or parties for those funds with the proposal, including the funded amount and timing for release of funds. Additionally, offerors must include a contingency plan detailing how the project will be executed if external capital is not forthcoming within the project period of performance. This plan should provide a clear and realistic assessment of the project's progress based on the resources

currently available.

For any questions about template use, please email PM@ISSNationalLab.org.

Indirect Rates Justification

CASIS shall recognize and apply to all grant agreements any approved federally recognized indirect cost rate that has been negotiated between the offeror and a U.S. government agency. If no such rate has been negotiated with a U.S. government agency, CASIS shall apply a de minimis rate of fifteen percent (15%) for those seeking indirect costs in a grant award. Also, CASIS will allow a grantee to voluntarily waive indirect costs or charge less than the full de minimis indirect cost rate should they choose to do so.

All proposal submissions seeking funding from CASIS are subject to this policy. All grantees are required to provide satisfactory written evidence in or accompanying their proposal submission of a previously approved federal indirect rate. Such evidence shall demonstrate the existence of an approved federally recognized indirect cost rate negotiated between the grantee and a U.S. government agency. In the absence of this evidence, CASIS will apply the de minimis indirect cost rate stated above.

2.5 Alternative Sections (Not included in page count)

Follow-on Activities: For planning purposes, it is helpful to know as soon as practical if follow-on activities or additional project iterations are anticipated. Assuming the project outcomes are successful, the offeror is welcomed to describe the types of anticipated follow-on activities that are not already included in the proposed project by providing an overview of next steps, anticipated costs, and any dependencies or efficiencies that exist between the main project and the follow-on effort. Please use the *Iterative Research Multiple Flight Questionnaire* (Appendix D) to provide this information.

Alternative Cost Estimates: The cost for the alternatives or follow-on activities should be reflected in this section and not in the narrative or summary in the main budget section of the proposal.

2.6 Proposal Attachments (Not included in page count)

Templates for requisite attachments will be provided on the research announcement webpage.

Required Proposal Attachments

- A. *Biographical Sketch (two pages or less per PI/Co-I):* Supply a biographical sketch (including citizenship status) for each PI or Co-I and background on key collaborators. Include information on past success in the field of study. Specifically, note expertise relevant to addressing the scope and scale of the project from inception through completion. Address the investigator's record of success in the field of study and provide relevant publications, commercial examples, patents, or technology implementation experience. If the project is collaborative (e.g., multiple institutions or Co-Is), describe the roles and responsibilities of each partner and the experience each has for that role. Please include educational history,

professional experience, publications, and current grant funding. The PI and Co-PIs must be U.S. persons¹.

- B. *Literature Cited*: Provide literature citations for any material cited in the technical section or any other references supporting the proposal.
- C. *Preliminary Experiment Requirements Document (P-ERD)*: Include an operations concept for each phase. Identify science, engineering, and/or technical requirements for the initial phase. Include requirements for additional phases if known. Offerors can format this document as they see fit.
- D. *Implementation Partner Statement of Work (SoW)*
SoW shall provide the following information:
- An overview or summary to include how the Implementation Partner's offerings, expertise, and experience align with the project goals, aims, or objectives.
 - A detailed total scope and end-to-end mission management Statement of Work to include:
 1. Logistics: Proposed resources, including facility needs for ground testing and flight operations support, use of space station crew for research support (crew time), power and data requirements, and postflight requirements
 2. Hardware: Availability, flight readiness status, limitations, mass/volume, appropriate planned use, and a cost/feasibility assessment for hardware modifications or new hardware requirements
 3. Operations planning: Concept of operations, including sample/data collection, and return plan.
 4. Required Experiment Verification Testing and/or Payload Verification Testing to meet with quality and mission assurance standards as prescribed by the PI, company, or organization.
 5. Hazards: Procedures, situations, and materials that could potentially be hazardous and result in launch readiness delays; include a plan to mitigate any identified issues
 6. Safety: Completion of all payload safety milestones and related verifications
 7. Verification testing: Include projected requirements for all verification testing and closure of Certificate of Flight Readiness (CoFR) items.
 8. Other required testing to include, but not limited to, EMI, vibration, off-gassing, modified commercial off-the-shelf (COTS) hardware testing, or others, as projected by requirements.
 - Projected schedule: Preflight development and testing considerations, time to flight, and time to completion.
 - Detailed budget to include all costs associated with all activities.
 - Other comments or descriptions of the project
 - If the proposed solution requires facilities and/or hardware managed by another commercial implementation partner, a letter of support from that implementation partner is required.
- E. *Data Management Plan (DMP)*: Include in the proposal appendices a supplementary document of no more than two pages labeled "Data Management Plan." Proposals that

do not include a DMP will not be evaluated. The requirements for DMPs are documented in existing U.S. Government directives and NASA policies for research data and publication access, including the following:

- [“NASA Plan for Increasing Access to the Results of Scientific Research”](#)
- [NPD 2230.1, Research Data and Publication Access](#)

This supplementary document should describe how the project will conform to NASA policy and directives on the dissemination and sharing of data and may include:

1. The types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project
2. The standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies)
3. Policies for access and sharing, including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements (CASIS encourages publication of data and inclusion in publicly accessible databases such as Physical Sciences Informatics or GeneLab, when possible.)
4. Policies and provisions for re-use, re-distribution, and the production of derivatives
5. Plans for archiving data, samples, and other research products, and for preservation of access to them.
6. Policies and best practices as they relate to data quality control and how those actions will be taken throughout the course of the research.
7. Roles and responsibilities of team members, as they relate to the documentation, collection, screening, validating, and auditing of data obtained throughout project research.

Simultaneously submitted collaborative proposals and proposals that include subawards are a single unified project and should include only one supplemental combined DMP, regardless of the number of non-lead collaborative proposals or subawards included. In such collaborative proposals, the data management plan should discuss the relevant data issues in the context of the collaboration.

Offerors who feel that the plan cannot fit within the limit of two pages may use part of the 15-page Technical Section of the proposal for additional data management information. Offerors are advised that the DMP must not be used to circumvent the 15-page Technical Section limitation. The DMP will be reviewed as an integral part of the proposal for the scientific community of relevance.

- F. *Completed Budget (Excel spreadsheet)*
- G. *Approved Indirect Rate Agreement (as applicable):* Attach written evidence demonstrating the existence of an approved federally recognized indirect cost rate negotiated between the grantee and a U.S. government agency. See Section 2.4 above for detailed instructions.
- H. *Copy of Institutional Animal Care and Use Committee (IACUC) Approval (as applicable):*

Proposals involving animals or humans require an assurance of compliance with appropriate oversight boards and their required provisions. All proposals must include a statement from the offeror's institution certifying that the proposed work will meet all federal and local human subject requirements and animal care and use requirements. If Institutional Review Board or Institutional Animal Care and Use Committee (IACUC) certification is already approved at proposal submission, attach a copy of the certification. If this certification is pending, the offeror must submit a copy to CASIS within 90 days after notice of award.

- I. *Vertebrate Animal and Higher Order Cephalopod Section (VACS) (as applicable)*: If live vertebrate animals or higher-order cephalopods (hereinafter, animals) are to be used, the following criteria must be addressed completely in a VACS of the proposal. The criteria must be addressed for work proposed at every performance site—this is the site (institution) where procedures with animals will be performed. If the offeror's institution is not the site where animal work will be performed or if the work will be performed at several sites, these performance sites must be identified.
 1. **Description of Procedures (Vertebrate Animals Section)**
Provide a concise description of the proposed procedures to be used that involve live vertebrate animals. Identify the species, strains, ages, sex, and total number of animals by species to be used.
 2. **Justifications (Vertebrate Animals Section)**
Provide justification that the species are appropriate for the proposed research. Explain why the research goals cannot be accomplished using an alternative model (e.g., computational, human, invertebrate, in vitro).
 3. **Minimization of Pain and Distress (Vertebrate Animals Section)**
Describe the interventions to minimize discomfort, distress, pain, and injury. These include analgesia, anesthesia, sedation, palliative care, and humane endpoints.
 4. **Method of Euthanasia (Cover Page Supplement/PHS Fellowship Supplemental Form)**
Provide a justification for methods of euthanasia that are not consistent with the American Veterinary Medical Association (AVMA) Guidelines for the Euthanasia of Animals. If the answer is "No" to the question "Is method consistent with AVMA guidelines?", describe the method and provide scientific justification in the text field provided.
- J. *PI Profile and Certifications form*: Provide information about the Principal Investigator using the PI Profile and Certifications form and attach it to the submission. NOTE: Any changes in the PI that are made after project selection are strongly discouraged and must be pre-approved by CASIS. Requests for PI changes will be closely scrutinized and may cause delays in grant execution.
- K. *SAM.gov Registration*: The offeror's organization must be registered with the System for Award Management (SAM.gov). The offeror must attach a downloaded PDF copy of the SAM Entity Registration Core Data to the proposal appendices.

Additional Proposal Attachments (as applicable)

- A. *Letters of Support*: If the offeror has received letters of commercial support or letters of commitment from collaborators, the offeror must attach them to the proposal. Identify the contribution the collaborator intends to make along with a commitment to perform the work. Up to three professional references may also be included.
- B. *Co-Principal Investigator Profile and Certifications form*: If the project has a Co-PI, complete the Co-PI Profile and Certifications form, and attach it to the submission.
- C. *Iterative Research Multiple Flight Questionnaire*: If the offeror is anticipating the requirement for iterative microgravity studies, which would include multiple flights, please complete the questionnaire provided in Appendix D and include it with the proposal submission.
- D. *Supporting Plans and Technical Data (limited to 5 pages)*: Include data sheets, charts, and excerpts from referenced research.

3 PROPOSAL EVALUATION AND SELECTION

3.1 Evaluation Factors and Process

A peer review evaluation process will be used to evaluate the proposal. This type of evaluation relates directly to the CASIS mission to identify projects that maximize the return on investment for the ISS platform. Benefits are captured through each of the evaluation categories in Section 2 by using a rubric-based sheet to form a provisional score for that category. Criteria within those categories are weighted based on the expected strength of that criteria for the specific line of business (i.e., technology development/demonstration). In addition, overall strengths and weaknesses, as well as any notable features, will be documented by evaluators. This information is used by evaluators to synthesize an “adjectival rating,” as shown in Table 1.

The adjectival ratings and strengths and weaknesses identified by the proposal evaluators are used by the CASIS final determination committee and chief executive officer to determine which proposals will be selected for award.

Evaluation Factors: Proposals will be evaluated based on four factors: scientific & technical merit, business & economic impact, implementation feasibility, and operations & ISS utilization. Each factor is comprised of multiple subfactors, all of which are numerically weighted and scored. All proposals submitted must include an expressed commercial purpose or intent.

Relative Order of Importance of Evaluation Factors: Business & economic impact is more important than scientific & technical merit, which is more important than implementation feasibility and operations & ISS utilization combined. Implementation feasibility and operations & ISS utilization are of equal weight. Cost is not scored in proposal evaluation but is considered in final selection.

Prior to evaluation, the CASIS Portfolio Management team will review the proposal to ensure that major elements have been completed satisfactorily based on the guidelines provided. An attempt will be made to resolve any findings with the PI teams before beginning a formal review.

Table 1: Adjectival rating descriptions

Score	Adjectival Rating	Strengths and Weaknesses
>85-100	Excellent	A truly outstanding proposal. Few, if any, weaknesses are noted, and there are many strengths. A proposal with this rating should be compelling and a top-tier effort.
>75-85	Very Good	A better-than-average proposal. Strengths outweigh weaknesses, and there are no meaningful non-compliant criteria responses. A proposal of this rating would have attractive features noted in strengths that would easily justify selection.
>65-75	Good	An acceptable proposal. Weaknesses and strengths are essentially balanced. Any non-compliant criteria responses are easily correctable. A proposal rated as “Good” in all categories would be “on the cusp” for selection.
>50-65	Fair	A marginal proposal. Weaknesses outweigh strengths (perhaps significantly). The evaluation may identify non-compliant criteria responses, but these should be correctable with additional effort by the offeror or Implementation Partner.
0-50	Poor	A non-selectable proposal. Few if any strengths and many weaknesses, some of which may include uncorrectable non-compliant criteria responses.

Subject matter experts will evaluate the proposal using the following steps:

1. **Technical Evaluations:** Peer reviews by external subject matter experts to determine the adjectival rating of each technical category.
2. **Compliance and Budget Review:** The CASIS Contracts and Compliance department will review the offeror’s completed forms and budget estimate for risks, limitations, and contracting concerns for consideration during final determination.
3. **Evaluation Integration:** The team of evaluators representing operations, science, and economics will integrate individual category adjectival ratings, collate notable features, assess resource requirements, synthesize an overall risk assessment, and prepare a recommendation for the CASIS final determination committee and chief executive officer. This team will also convey feedback to offerors on request.
4. **Final Determination:** The CASIS chief executive officer and chief scientist will perform the final prioritization and award determination (project selection), initiating discussions with members of the operations, science, and economic review teams and CASIS senior staff, as necessary.

All information contained within a proposal and any presentation material will be treated as confidential and reviewed only by CASIS personnel or third-party subject matter experts providing technical reviews. Please ensure the proposal includes an appropriate confidentiality disclaimer (and appropriate regulatory disclaimers, e.g., ITAR or EAR) on all pages.

CASIS has overall responsibility for conducting proposal evaluations but will rely on external

constituents under contract with CASIS and with relevant expertise to determine category adjectival rating. All non-U.S. Government subject matter experts are required to sign a confidentiality agreement and a conflict-of-interest form with the ISS National Lab prior to receipt of proposals for review.

CASIS may share proposals with select NASA personnel for the purpose of completing an operational feasibility review of the experiment design, the availability of flight hardware and facilities required for the execution of the experiment on the ISS, or funding mechanisms.

3.2 Final Determination

At final determination, the CASIS chief executive officer (CEO), chief scientist, and chief operating officer (COO) serve as the primary decision authorities for project selection. The CEO is the final decision authority. In the absence of the CEO, the COO may serve as final authority. Directors of payload operations, investment and economic analysis, and portfolio management serve as advisors to the decision authorities. At the discretion of one or more primary decision authorities, additional advisors may be included in the meeting. All participants will be subject to conflict-of-interest determination and will be included in the participation log.

The decision authorities consider all input and make the final determination of project funding and priority. In addition to the proposal evaluation results, ISS resource allocation priorities, current strategic priorities, budget availability, and overall programmatic risk are major considerations in determining which projects are either sponsored for flight, set aside for future consideration, or not selected.

Projects identified to be sponsored are issued a non-binding notice of intent to award and subsequently moved to agreement drafting, negotiation, and award. Selected projects must meet minimum eligibility requirements, such as readiness for an increment, secured funding, and an agreement with an Implementation Partner, if appropriate. Projects that pass the review process but are not selected for sponsorship are set aside for up to six months to be targeted for external funding when possible. Offerors whose proposals are not selected will be notified and given feedback on proposal weaknesses. After the final determination meeting, CASIS will coordinate with the NASA liaison regarding the specific allocation of ISS research resources for selected projects.

At the discretion of the final determination decision authority, a principal investigator may be asked to provide clarifying information to address unanswered questions relevant to the overall merit of a proposal. Clarifying information will be treated as an augmentation to the original proposal. All criteria affected by the clarifying information in the revised proposal will be re-evaluated and scored based on the relevant scoring rubric, and the adjectival rating will be redetermined based on the revised score. An adjusted adjectival rating will become the new final adjectival rating for the proposal and will govern the proposal's award worthiness.

3.3 Revision/Resubmission Limit

Proposals not selected can be revised based on feedback and resubmitted. Investigators resubmitting a proposal in response to this solicitation may only submit a proposal with similar hypothesis(es) and aims a total of three times (original submission plus two resubmissions). Significant changes must be made to the proposal hypothesis(es) and aims for consideration after the third attempt, or the proposal may be declined without further review.

Investigators that have submitted a proposal with similar hypothesis(es) and aims to a previous solicitation that was not accepted and are now submitting a proposal in response to this solicitation are required to submit a "Response to Prior Reviews." This response must explain the changes made to the current proposal as a result of previous review comments and/or an explanation of why the previous review comments are not applicable to the current proposal. This response shall be presented preceding the proposal abstract as part of the main proposal and is limited to two pages. Responses to prior reviews that exceed two pages will be redacted to include only the first two pages and the PI will be notified.

3.4 Appeals

CASIS will notify the PI or authorized official submitting the application of project selection or non-selection by email. This notification will include reviewers' comments from the technical, economic, and feasibility evaluations. Anyone who is adversely affected by the decision made by CASIS and would like to appeal shall submit a written appeal to the CASIS chief executive officer within 10 calendar days from the date of notification. This appeal consists of a written statement of up to 10 pages stating the basis for the appeal. The appeal will be considered by a member of CASIS senior management who was not involved in the final determination. Failure to file an appeal within the prescribed time constitutes waiver of right to appeal.

3.5 Proposals Submitted as Part of an Agreement with an External Organization

Proposals originating as part of an agreement by CASIS with a U.S. government agency or an outside organization are reviewed in the same manner as all other proposals. However, the final selection and prioritization of these proposals, including award determination, may rely on review criteria defined by the U.S. government agency or external organization co-sponsoring the solicitation. CASIS may also choose by written agreement with a U.S. government agency or an outside organization to supplant the CASIS scientific or economic review process for proposals with the review process that is applied by the U.S. government agency or external organization. All other aspects of the CASIS review process remain the same.

4 CONTRACTS

Offerors whose proposal is accepted will be required to enter into either a User Agreement (unfunded) or Grant Agreement (funded) with CASIS, at CASIS' sole discretion. CASIS is required contractually by the NASA Cooperative Agreement and by United States federal law, rules, and regulations to flow down various contractual terms and conditions to any award recipients. These terms and conditions are regulated in part by the Federal Acquisition Regulations (FAR), Title 48 of the C.F.R., as well as by NASA-specific rules, regulations, and policies.

The terms and conditions contained in our standard agreements are non-negotiable. If invited to submit a full proposal, offerors will be required to agree and accept the terms and conditions by signing and returning the proposal cover page. If the Proposing Organization will be unable to agree to these terms and conditions and requires any changes, they must attach an addendum to their proposal entitled "Requested Revisions to Terms and Conditions" identifying the proposed change(s) and including clear and detailed reasoning for each requested change. The addendum must follow the format guidelines of

the proposal and be submitted as a separate document attached as an addendum to the proposal submission (excluded from page count). There is a checkbox on the proposal cover page template and the online proposal submission form to indicate this request. Failure to reach an agreement on requested revisions prior to the CASIS project selection date (typically 60 days after proposal submission) may result in the rejection of this proposal with CASIS retaining the sole right to select the next favorable proposal. Additionally, if the offeror's organization intends to work with any collaborators, the offeror must contract with those collaborators and include the CASIS flow down clauses. These terms and conditions from the NASA Cooperative Agreement will apply to all Grant Agreements and User Agreements. A copy of the standard Grant Agreement and User Agreement will be provided as PDF files located in the zipped documents made available to offerors via the web page for the solicitation.

Appendix A Summary of Required and Optional Documentation for Proposal Submissions

Name of Section or Form	Format	Limitation	Inclusion Location	Instruction Page
Cover Page	PDF form	1 page	Top sheet of proposal	3, 21
Project Abstract	PDF	1 page	Proposal Page 1	3
Technical Section	PDF	15 pages	Proposal Body	4
Budget Section	PDF	No limit	Proposal Body	10
Budget	CASIS template (spreadsheet)	No limit	Attach to submission	10, 13
Approved Indirect Rate Agreement (if applicable)	PDF	No limit	Attach to submission (or provide electronic access)	11, 13
Biographical Sketch	PDF	2 pages per PI/ Co-I	Proposal Appendix	11
Literature Citations	PDF	No limit	Proposal Appendix	12
Preliminary Experiment Requirements Document	PDF	No limit	Proposal Appendix	12, 23
Implementation Partner Statement of Work	PDF	No limit	Proposal Appendix	12
Data Management Plan	PDF	2 pages	Proposal Appendix	12-13
Copy of IACUC Approval (if applicable)	PDF	No limit	Proposal Appendix	14
Vertebrate Animal and Higher Order Cephalopod Section (VACS) (if applicable)	PDF	No limit	Proposal Appendix	14
PI Profile and Certifications	PDF form	No limit	Attach form to submission	14
SAM.gov Registration (if applicable)	PDF	No limit	Proposal Appendix	14
Letters of Support, Letters of Reference (optional)	PDF	No limit	Proposal Appendix	15
Co-PI Profile and Certifications (if applicable)	PDF form	No limit	Attach form to submission	15
Iterative Research Multiple Flight Questionnaire (optional)	PDF	3 pages	Proposal Appendix	15, 24
Supporting Technical Data (optional)	PDF	5 pages	Proposal Appendix	15

Note: All documentation is required unless otherwise noted as “optional” or “if applicable.”

Appendix B

Proposal Cover Page



ISS NATIONAL LABORATORY®
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Project Proposal Submission

NLRA 2025-5: Technology Advancement and Applied Research Leveraging the ISS National Lab

Project Name:		
Proposal # (if applicable):	Revision # (if applicable):	Submission Date:
Principal Investigator (PI):		Email:

Trade Compliance

The Proposing Organization agrees to comply with all applicable U.S. export control laws and regulations, specifically including, but not limited to, the requirements of the Arms Export Control Act, 22 U.S.C.2751- 2799, including the International Traffic in Arms Regulation (ITAR), 22 C.F.R. 120-130.; and the Export Administration Act, 50 U.S.C. app. 2401-2420, including the Export Administration Regulations, 15 C.F.R. 730-774; including the requirement for obtaining any export license or other approval. If applicable, the Proposing Organization shall ensure all pages of this proposal are properly annotated.

To the extent permitted by applicable state law, the Proposing Organization shall indemnify and hold CASIS harmless for all damages, costs, fines, penalties, attorney fees, and all other expenses arising from any claim or demand that the Proposing Organization failed to comply with export laws in connection with this proposed project.

Agreement with the Terms and Conditions in the CASIS Agreement Templates

The undersigned understands and agrees that if this proposal is accepted, the Proposing Organization will enter into a standard [User Agreement or Grant Agreement](#), which includes CASIS standard terms and conditions. These standard terms and conditions are non-negotiable. If the Proposing Organization is unable to agree to these terms and conditions and requires changes, they must select the checkbox below and attach an addendum to their proposal entitled “Requested Revisions to Standard Terms and Conditions” identifying the proposed change(s) with detailed reasoning for each. See section 4 para. 2 of the Proposal Instructions for more information. Failure to reach an agreement on requested revisions prior to the CASIS project selection date (typically 60 days after proposal submission) may result in the rejection of this proposal with CASIS retaining the sole right to select the next favorable proposal.

** By checking this box the undersigned organization seeks changes to the above specified agreements and has attached documentation to the proposal submission, in the addendum section, for consideration. **

*Proposing Organization authorized representative signature:

Date: _____

*Proposing Organization authorized representative name and title:

Principal investigator (PI) signature:

Date: _____

Principal investigator (PI) name: _____

Principal investigator (PI) title: _____

*The administrative representative who is empowered to make certifications, representations, and commitments on behalf of the proposing organization, ensuring compliance with CASIS policies and award requirements.

Appendix C Preliminary Experiment Requirements Document



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ISS National Laboratory Preliminary Experiment Requirements Document (P-ERD)

Operations Concept

Include any known investigation and/or project operations concepts that would be helpful to CASIS during the Operational Feasibility Review. Please include as many science, engineering, and/or technology requirements that may be known at this stage of the proposal development phase. Offerors are encouraged to work closely with their Implementation Partner to address these requirements where applicable.

Factors to consider may include:

- Crew time estimates
 - Ascent and descent requirements
 - Proposed hardware to be used/built/modified
 - Materials list
 - Proposed model organisms
 - Any known design requirements
 - Any known volume, mass, or other size specifications
 - Any known specific stowage requirements (e.g., conditioned, passive, temperature ranges, etc.)
 - Any investigation timing requirements (e.g., timing of addition of new media, fixation agents, etc.)
 - Any specific late load or early return requirements
 - Any ground control requirements
-

Appendix D Iterative Research Multiple Flight Questionnaire



ISS NATIONAL LABORATORY®
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Iterative Research Multiple Flight Questionnaire

Technology Development/Demonstration Research Leveraging the ISS National Lab

Proposed Project Name:

Principal Investigator (PI):

Offerors that anticipate a requirement for iterative studies that would include multiple flights to the ISS for successful completion are encouraged to provide additional information.

Please provide an answer to each of the following questions and delete italicized text before submission. Please use no less than 12-point font and one-inch margins. Please limit this response to a maximum of 3 pages. Headings, bullets, and charts or graphics may be used as desired.

1. *If the initial flight is successful or if results warrant an additional step or steps in the science/technology maturation, describe the number and nature of corresponding successive flight experiments. How is the research question posed or technology maturation goal different from that of preceding flight experiment(s)?*
2. *What would be the objectives and technical approach for the follow-on effort(s)? (This can be for a ground-based or flight effort.)*
3. *What resources are going to be needed to execute the follow-on effort(s)?*
4. *What does the offeror anticipate learning from that effort?*