



**Request for Proposals NO. CASIS 2014-2**  
**Enabling Technology To Support Science in Space For Life On Earth**

**ISSUANCE Date: February 26, 2014**

**Center for the Advancement of Science in Space**  
Space Life Sciences Lab  
505 Odyssey Way  
Exploration Park, FL 32953

Step-1 Proposals due 5:00 PM EDT, April 10, 2014

Step-2 Proposals due 5:00 PM EDT, June 27, 2014

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## **1. INFORMATION ON CASIS AND NEW SUBMISSION PROCEDURES**

The Center for the Advancement of Science in Space (CASIS) is an IRC Section 501(c)(3) entity responsible for management of the International Space Station (ISS) U.S. National Laboratory under a Cooperative Agreement with NASA (NNH11CD70A). Per Section 504 of the NASA Authorization Act of 2010, the purpose of CASIS is to maximize the value of the investment the U.S. government made in the ISS National Lab and demonstrate the scientific and technological productivity of the ISS National Lab over the next decade. CASIS seeks to advance scientific research, technology development and education in conjunction with utilization of the ISS, managing a diverse research and education portfolio across a broad range of scientific fields.

### **1.1 CASIS New Submission Procedures**

For this solicitation, CASIS is adopting a 2-Step proposal process for which the Letter of Intent (LOI) has been replaced by a **required** Step-1 Proposal. The required elements of the Step-1 Proposal are described in section 3.1 below.

### **1.2 CASIS Goals**

- a) Stimulate, develop and manage the U.S. national uses of the ISS National Lab by U.S. government agencies, academic institutions and private firms.
- b) Develop tools and techniques to communicate the value of uses of the ISS research platform and increase the return on the U.S. investment in the ISS National Lab.

### **1.3 CASIS Strategies and Objectives**

- a) Identify the capabilities of the ISS and provide breakthrough opportunities for uses in science and applications, technology development and education, including human health, biological sciences, biotechnology, biological research, energy and biofuels, physical and materials science and development, engineering research and technology development, and Earth and space imaging and observations.
- b) Identify and prioritize research pathways, ensuring diversity without over-committing ISS National Lab resources.
- c) Increase customer base and facilitate the matching of research pathways with qualified funding sources.
- d) Formulate a comprehensive portfolio of activities to maximize the value of the ISS National Lab as a venue for education activities.
- e) Track the research portfolio and projects to understand and communicate the net value created.

## **2. DESCRIPTION OF RESEARCH GRANT**

### **2.1 Purpose of Grant**

The purpose of this Request for Proposals (RFP) is to solicit flight projects for enabling technologies that develop tools and/or techniques to increase the return on the U.S. investment in the ISS National Lab and enhance the value of the space station research platform. Responsive applications will describe use of the ISS National Lab for the development, testing, and/or utilization of new technologies, components and/or systems that will enable science-based investigations for Earth-based applications. This Request

for Proposals (RFP) solicits applications for flight projects to the ISS National Lab from commercial and academic investigators. The CASIS mission to the ISS National Lab is to advance science research and technology development, expand human knowledge, inspire and educate the next generation, foster the commercial development of space, and demonstrate capabilities to enable science in space for Earth benefit. To execute this mission, CASIS seeks technologies, research platforms, and operational concepts that enable new or improve existing analytical capabilities to benefit space science on the ISS National Lab for Earth benefit.

CASIS seeks proposals for enabling technologies in one or more of the following areas:

- A) Scientific instruments and data collection;
- B) Materials, structures, and manufacturing;
- C) Operational procedures that advance the capability of the ISS National Lab as a research and technology development platform to benefit life on Earth.

Excluded areas: New Instrument Commercial Applications for Remote Sensing

CASIS will not consider at this time any proposals that would utilize new sensors or instruments to be flown to the ISS to engage in remote sensing for ongoing or long-term commercial purposes. In the future, CASIS may issue a separate RFP concerning such activity.

## **2.2 Award Information**

CASIS anticipates total funding for this solicitation to be up to \$1M. The number of grants awarded and the amount of each grant will depend on the number of meritorious applications received and instrument/equipment/resources requested, but proposed budgets in Step-2 proposals should not exceed \$300K total cost over the award period. Flight opportunities to the ISS National Lab for awarded grants are anticipated to be available during calendar year 2015.

## **2.3 Deadline for Completion of Project**

Selected projects must be flight ready within 12 months of the award and must be completed (with final report submitted) by six months postflight. If flight schedules change, investigators may modify proposed timelines, subject to review and approval by the CASIS Operations team.

## **2.4 Background**

The unique environment of the ISS is challenging to both living and engineered systems even in the environmentally controlled habitat inside the nodes of the ISS. Outside of the ISS, even brief exposure to the space environment is lethal to many biological systems and demonstrably hostile to many materials and engineered systems on different time scales. Exposure to microgravity inside the ISS and exposure to the elements of space (e.g., vacuum, ultraviolet light, atomic oxygen, thermal cycling, micrometeoroids, and charged particle radiation) outside the ISS enable accelerated technology development and testing in a laboratory unlike any other. The ISS National Lab supports a variety of facilities and platforms to exploit both the interior crew habitat and the exposed outer environment of low Earth orbit for the development and testing of innovative technologies, devices, and subsystems for Earth benefit.

## 2.5 Research and Technology Development Objectives

CASIS seeks technological concepts related to instrument development and/or science investigations on the ISS National Lab that benefit life on Earth. The topics listed in the thrust areas below span the broad interests of CASIS but are not all encompassing and should not be considered as the entire scope of potential emphasis areas. CASIS welcomes Step-1 proposals in all technology areas relevant to the mission of CASIS and utilization of the ISS National Lab, not only those listed below.

- 1) Innovative uses of the ISS National Lab facilities or ISS hardware that leverage existing capabilities to stimulate utilization of the ISS National Lab and economic development in the United States for Earth benefit.
- 2) Innovative improvements to existing processes and/or templates to reduce the cost of science investigation or payload development on the ISS National Lab.
- 3) Other improvements to existing ISS capabilities, including but not limited to infrastructure, *in situ* analytical tools, and communication/data transmittal, to increase the efficiency, effectiveness, and/or throughput of the science investigations performed on the ISS National Lab.
- 4) Commercial-off-the-shelf (COTS) hardware for utilization on ISS to support the automated cultivation and analysis of cells and tissues in adherent or suspension culture in microgravity. For example, three-dimensional cell suspension culture systems or analytical platforms supporting a wide variety of cell and tissue types in quantities that allow experimental screening of growth in microgravity of different cell/tissue types and culture conditions for up to 30 days.
- 5) COTS miniaturized hardware for utilization on ISS to support nucleic acid extraction, purification, detection, quantification, and/or cryopreservation of biological and environmental sample matrices by target amplification, concentration/enrichment, hybridization, and/or sequencing in microgravity.
- 6) COTS miniaturized hardware for utilization on ISS to support non-destructive, minimally invasive monitoring or imaging of physiological, cellular, and/or molecular responses in living cells, tissues, organ systems, and/or whole organisms in microgravity. For example, instrumentation or platforms for flow cytometry and/or epifluorescence/confocal/light sheet microscopy in microgravity are desirable.
- 7) COTS miniaturized sensors, electronic/mechanical actuators or devices, and/or instrumentation with unique capabilities for utilization and/or enhanced performance in microgravity (e.g., microfluidic systems, nanomaterials, and nanotechnologies for gene delivery, drug delivery, or health monitoring systems).
- 8) Biotechnologies, sustainable biological systems (e.g., agricultural biotechnology) and engineered sustainable systems (e.g., physical-chemical technologies) for energy capture, generation and/or storage or environmental control and life support (e.g. air/water recovery, waste disposal, etc.) for Earth benefit.
- 9) Materials, structures, and/or manufacturing technologies for Earth benefit that require the microgravity, ultraviolet, thermal, and energized particle radiation environment of space for their fundamental study, design, development, testing, and/or engineering.
- 10) Educational/instructional technologies that enable access to and knowledge of the ISS National Lab for targeted STEM opportunities.

CASIS strongly recommends submitting letters of support to demonstrate feasibility or commercial interest, when applicable.

CASIS will assist grantees in translating ground-based and flight experiments into space-appropriate models. However, each proposer should be familiar with the capabilities of flight hardware and ISS National Lab facilities for on-orbit studies. Information on implementation partners is available on the CASIS Web site (<http://www.iss-casis.org/IP Directory>) and information on ISS facilities is available in NASA publication NP-2012-10-027-JSC, *International Space Station Facilities: Research in Space 2013 and Beyond*, which is available on the CASIS website at <http://www.iss-casis.org/solicitations>. An ideal proposal will demonstrate investigator knowledge of the significant challenges and importance of translating ground-based experimental or testing methods into methods compatible with flight hardware. If proposing to develop new hardware, proposers should be familiar with the guidelines and constraints for successful approval and flight, also found at the Web address above. **All proposers should read this online material and the hardware section below under “Services and Support Provided by CASIS”** to clearly understand the hardware platform and capabilities on the station.

## 2.6 Qualifications of Grantee

Any U.S. institution that can respond to the target area described in this RFP may apply. However, CASIS will not consider projects using non-U.S. sponsorship.

Please note: Due to the limitations under the CASIS Cooperative Agreement and our strategic approach, CASIS will not be able to accept and fund proposals submitted by NASA and/or NASA employees.

**Before submitting Step-1 proposals, new-to-space proposers are strongly encouraged to consult with the CASIS Operations team ([opsinfo@iss-casis.org](mailto:opsinfo@iss-casis.org))** for feedback regarding feasibility and compliance with flight requirements and capabilities. The Operations team will be available for these consultations until 24 hours prior to the submission date for Step-2 Proposals. CASIS also encourages proposers to seek the support of implementation partners (service providers who assist in payload integration) that have experience in and understand the requirements for space-based research. See <http://www.iss-casis.org/IP Directory> for a list of suggested implementation partners.

## 2.7 Services and Support Provided by CASIS

CASIS offers many support services to enable efficient execution of space-science initiatives, even for first-time users. In accordance with a cooperative agreement with NASA, CASIS will assist researchers and grantees in transitioning their science and research experiments into manifested payloads—including identifying and executing steps to meet the requirements discussed below and in Section 4.10 titled “Progress Reports.”

Services include solicitation and coordination of implementation partners, identification of and facilitation in acquiring required hardware and software, access to state-of-the-art laboratories, coordination of ground-based work, and coordination with NASA. CASIS will facilitate in these processes, sometimes covering costs for implementation partner services. However, service provider costs are the responsibility of the grantee(s); CASIS does not cover these costs unless the written agreement between the grantee(s) and CASIS so specifies and all parties agree. The projected budget submitted should include these costs. Proposers should thus contact prospective implementation partners while developing their application and should include the implementation cost in the budget.

For funded projects, CASIS will provide without charge access to on-orbit facilities, data processing capabilities, and crew time for experiments. NASA will supply transport and on-orbit resources within

the available capacity and without additional cost. The grantee will be responsible for all other costs. In addition to overall project management, CASIS will facilitate the following specific support services.

Before research on the ISS begins, CASIS offers ground-based products and services for grantees to assist with science definition and payload development. CASIS can facilitate:

- Access to a large repository of previous space experiments with promising commercial development and innovation
- Collaboration with experienced payload developers and other subject matter experts to ensure successful experiments and completion of all mission requirements; to provide payload integration support and to coordinate with NASA in crew training, procedure development and timeline activities planning
- Help in finding resources for compliance with export control regulations
- Access to a state-of-the-art facility offering specialized capabilities for payload verification testing and pre-launch processing
- Coordination with NASA and launch vehicle providers to produce an integrated schedule.

During flight, CASIS offers project management services and support for product development to facilitate the interface between the investigator, the implementation partner, and NASA:

- Coordination of "real time" on-orbit payload operations
- Development of data and software interfaces
- Coordination of contingency planning and mission changes to preserve science objectives.

After completion of research on the ISS, CASIS may facilitate additional services:

- Identification of appropriate facilities for post-processing activities
- Coordination with implementation partners to ensure that all postflight data and report requirements are submitted to NASA and the principal investigator (PI) in a timely fashion
- Help in finding resources for intellectual property identification, registration and protection
- Coordination of *in situ* experiment termination, including cold stowage, fixation and data analysis
- Coordination and collaboration with the PI to ensure overall project success.

## **2.8 Available Hardware and Facilities**

Information on flight-certified hardware and ISS National Lab facilities are available at <http://www.iss-casis.org/solicitations>. Proposers should familiarize themselves with these hardware options and contact the CASIS Operations team ([opsinfo@iss-casis.org](mailto:opsinfo@iss-casis.org)) to submit any questions. The Operations team will be available through the submission date for Step-2 Proposals, to receive these queries. Answers will be posted on the CASIS Web site at <http://www.iss-casis.org/solicitations>. However, CASIS will not post answers that would jeopardize intellectual property or proprietary information and therefore cannot answer questions containing intellectual property or proprietary information. This policy ensures all proposers have the same information when submitting a proposal to CASIS.

Proposers whose flight proposals include the development of new hardware should be cautious. CASIS recommends using existing or proven hardware to ensure meeting budget and schedule requirements.

Flight operations must commence within 12 months of selection; therefore, viable strategies are probably limited to the use of currently available and certified flight hardware.

### **3. PROPOSAL SUBMISSION**

#### **3.1 Instructions for Submission of Step-1 Proposal**

All investigators who wish to submit a proposal in response to this RFP must submit a completed Step-1 Proposal Form. See Attachment A of this document for an example Step-1 Proposal Form. The Step-1 Proposal Form will be available on the CASIS website at <http://www.isscas.org/Step-1> and must be completed and submitted via the website no later than **April 10, 2014**.

All information submitted in the Step-1 proposal will be reviewed by CASIS and, possibly, by third parties providing assistance to CASIS in proposal review. Step-1 Proposals will be subject to a preliminary operational, scientific, and economic evaluation that will result in the encouragement or discouragement of submission of full proposals in Step-2. Applicants will receive email notification no later than May 2, 2014 on the results of the preliminary evaluation. Step-1 Proposals found not to be responsive to the research emphases of the solicitation will not be invited for full Step-2 Proposal submission, and no further consideration will be given. Step-2 Proposals should contain the same scientific goals and/or technology objectives identified in the Step-1 Proposal, but the project team is not considered binding for Step-1 and can be adjusted in an invited Step-2 Proposal. Do not include any confidential or proprietary information in your Step-1 Proposal.

#### **3.2 Questions About RFP**

Submit questions regarding the RFP to [info@iss-casis.org](mailto:info@iss-casis.org). Questions and answers will be posted on the CASIS Web site (<http://www.iss-casis.org/solicitations>). CASIS encourages prospective proposers to submit questions by April 10, 2014 to ensure that questions will be answered well before the submission date. CASIS will not accept questions or provide information concerning the RFP or proposal process by phone, and proposers should not rely upon any information provided orally. Moreover, CASIS cannot accept questions or provide answers containing confidential or proprietary information. This policy ensures all proposers have the same information when submitting a proposal to CASIS. It is the responsibility of the proposer to stay informed of all questions and answers posted to the CASIS website at <http://www.iss-casis.org/solicitations>. Questions related to the CASIS standard terms and conditions found at the link provided in Section 5.6 or at the CASIS website should be directed to [contracts@iss-casis.org](mailto:contracts@iss-casis.org).

#### **3.3 Modifications to RFP**

CASIS may issue written modifications to information in the RFP. It is the responsibility of the proposer to stay informed of all modifications posted to the CASIS website.

#### **3.4 Instructions for Submission of Step-2 Proposal**

Each section specified below, in section 3.5, should be clearly identified in the Step-2 Proposal, prepared in electronic format and provided in a single PDF file. CASIS will accept electronic submission of Step-2 Proposals from June 16, 2014 to June 27, 2014. Instructions for uploading these documents will be available at <http://www.iss-casis.org/solicitations>. All Step-2 Proposals must be submitted by 5:00 PM EDT, June 27, 2014.

### **3.5 Step-2 Proposal Format**

All information submitted in a Step-2 proposal will be treated as confidential and will be reviewed by only CASIS and third parties providing assistance to CASIS in proposal review. Step-2 Proposals must be single-spaced. Margins should be 0.75". Font size should be 11-point Arial, Calibri, Helvetica, Palatino Linotype, or Georgia typeface, black type only. Do not include headers or footers. Avoid using columns in text. Step-2 Proposals may include graphics, which must fit within the designated page limits and should be kept to a minimum. The Step-2 Proposal must contain the following sections. If any sections are not included in the Step-2 proposal, the proposal may be deemed non-responsive and ineligible for consideration.

Step-2 Proposals should contain the same scientific goals and/or technology objectives identified in the Step-1 Proposal, but the project team is not considered binding for Step-1 and can be adjusted in an invited Step-2 Proposal.

#### **Step-2 Proposal Cover Sheet**

Use the cover sheet form provided in Attachment B. (*Attachment B can be found on page 28 of this RFP.*)

#### **Cover Letter**

Step-2 Proposals may include a cover letter (maximum one page), which should briefly summarize the proposal: outline of project, scientific significance, and potential commercial impact. Include any conflicts of interest and special situations (these should also be detailed in Section V). Short bullet points are encouraged.

#### **Section I: Background and Overview**

*Maximum three pages.*

- 1) Abstract
- 2) Background, Significance and Preliminary Studies: Specifically note relevance to the CASIS mission and to RFP objectives. Include and explain background information from previous studies and preliminary data (e.g., syntheses, measurements, or tests).

#### **Section II: Detailed Project Plan**

*Maximum six pages.*

- 1) Research Design and Methodology
  - a) *Research Questions:* What are the main scientific questions that you plan to address? If appropriate, present as a hypothesis with specific aims. State concisely the goals of the proposed research and summarize the expected outcome(s), including how the proposed research will affect the research field(s) involved. List succinctly the specific objectives of the research proposed (e.g., to test a stated hypothesis, create a new design, solve a specific problem, challenge an existing paradigm, address a critical barrier to progress in the field, or develop new technology).

- b) *Research Strategy*: Outline the overall technical approach that you plan to use to address the above. Describe the proposed research, stating its significance and how it will be conducted. Cite published experimental details in the Research Strategy section, and supply the full reference in the Bibliography and References Cited section. (*For the Full Scientific Evaluation Criteria, refer to Section 4.3*)
- i. *Significance*: Explain why the problem is important and how the project addresses any critical barriers to progress in the field. Explain how the proposed project will improve scientific knowledge, technical capability, and/or commercialization efforts in one or more broad fields. Describe how achieving the proposed aims will change the concepts, methods, or technologies that drive this field.
  - ii. *Innovation*: Explain how the application challenges and seeks to shift current research paradigms. Describe any new theoretical concepts, approaches or instrumentation to be developed or used, as well as any advantage over existing methods and instrumentation. Explain any improvements or new applications of theoretical concepts, approaches, or instrumentation. Describe any potential to yield a new line of space research or to build upon prior ISS research.
  - iii. *Approach*: Describe the project's overall strategy, approach, and analyses to accomplish specific aims. Include how the data will be collected, analyzed, and interpreted. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims. If the project is in the early stages of development, describe strategies to establish feasibility, and address the management of any high-risk aspects of the proposed work.
    - *Experimental conditions*: Discuss the rationale for testing conditions, including details regarding proper statistical design and appropriate sample sizes, if relevant. Proposals should include information from any preliminary ground-based studies, if available.
    - *Translation*: Describe how the proposers intend to translate ground-based and aerial experimental methods and conditions to function within the available space-based hardware, taking into account hardware limitations and conditions. Note specific materials to be used to allow the Operations team to review ISS protocols and requirements.
- 2) *Technical Aspects of Spaceflight*: CASIS will facilitate new-to-space grantees in identifying service providers, hardware and experimental modifications, as well as developing a realistic budget and time frame for the project. However, proposers must provide estimates or suggested approaches, and ideal proposals will provide well-researched information in response to the below topics.
- a. *Service Providers*: List implementation partners for payload integration and the rationale for choosing them. If implementation partners have not yet been identified, describe the services needed to complete the proposed research.
  - b. *Flight Hardware*: Clearly delineate existing or proposed flight hardware to be used in the proposed project. For information regarding current and in-development hardware, see

“Available Hardware and Facilities”. Explain plans to integrate flight hardware into the project timeline. Requirements for applications proposing hardware development:

- i. Clearly describe design requirements, including detailed schematics and critical components, requisites and ground testing.
  - ii. Outline the steps to product development, including manufacturing timelines.
  - iii. List alternatives for hardware and components where applicable.
- 3) Facilities and Other Resources: Describe how the availability and capability of your research environment and organizational resources will enhance the probability of success of the project. Include facilities, unique features of the scientific environment, and any institutional investment in the success of the investigator (e.g., resources for training, mentorship, and administrative support).

### **Section III: Economic Impact of Project Success**

*Maximum three pages (For the Full Economic Evaluation Criteria, refer to Section 4.4)*

- 1) Describe the project’s potential commercial impact. Which market vertical(s) will it address (e.g., to which specific industries will it be relevant)? Describe further the scientific or commercial value of the research, development or testing of the targeted technology. Is the research relevant to current commercial or industrial applications, or would it create a new market? Describe the estimated size of (in dollars and in population, if applicable), growth of and competition within (company, product, cost) the market vertical(s). For all proposals, be explicit about potential applications of successful project results, and note whether successful results will be published or disseminated. If relevant, explain how your project, if successful, might enter its relevant market(s)—and how the advances from your work would be superior to other products or would be unique in the market. Estimate the time to market, including necessary certification steps. Describe how you will measure progress toward potential commercial application. Describe funding received to date and estimated funding required to bring the product to market. List any potential opportunities for intellectual property, supporting these anticipated successes with potential comparable intellectual property.
- 2) Describe any other impact of your results relevant to economic evaluation, including humanitarian impact. For example, explain how successful results might promote teaching, training and learning or broaden participation of underrepresented groups in science or technology. Describe how successful results would affect quality of life in the U.S. Describe how the project might advance U.S. leadership in space.

### **Section IV: Budget and Time Frame**

*No page limit, but be succinct.*

Provide a projected budget and time frame, broken down by month and organized using the following categories of cost, including personnel effort, supplies and ground experiments/controls: *(A Budget Template is provided on Attachment D - page 30 of this RFP)*

- Salary and fringe benefits for personnel
- Equipment and supplies
- Consultant costs
- Alterations and renovations
- Publications and miscellaneous costs
- Contract services
- Consortium costs
- Travel expenses
- Implementation partner services and hardware integration (if appropriate)
- Adequately define all indirect costs (not to exceed 25% of direct costs)
  - Indirect costs are costs not directly and exclusively accountable to the project. Examples are shared facilities/equipment and overhead. Direct costs are costs directly attributable to the project. The costs of materials and specific project labor are examples of direct costs. The institution or facility charge for indirect costs cannot exceed 25% of direct costs.
  - Indirect costs are not permitted to be recovered on certain types of costs. For the avoidance of doubt, excluded costs include purchased equipment, capital expenditures and the portion of subawards or subcontracts that exceed \$25,000.

Include justification for major cost elements. Include preflight development and testing considerations, time to flight and time to completion. Include milestones for project feasibility, preparation, and success.

#### **Section V: Additional Information**

*No page limit, but be succinct.*

- 1) Provide a signed Certificate Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion, using the form provided in Attachment C. (*Attachment C can be found on page 29 of this RFP*)
- 2) Provide a brief statement of the proposer's qualifications, including financial resources and organizational abilities to manage and complete the proposed project.
- 3) Provide letters of commercial support (should not exceed five pages).
- 4) Provide letters of commitment from collaborators. The proposal should contain a signed letter from each collaborator to the proposer that identifies the contribution the collaborator intends to make and a commitment to perform the work.
- 5) Provide a list of up to three references familiar with the proposer's qualifications and/or prior research experience.
- 6) If another government or funding agency has reviewed the proposed project, proposers must provide the results and scoring details/comments of that review.
- 7) Disclose all potential conflicts of interest.

- 8) Furnish a bibliography of any references cited. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers and year of publication.
- 9) For proposals employing animals, assurance of compliance with animal care and use provisions is required. In addition, the proposal must include a statement from the applicant institution certifying that the proposed work will meet all Federal and local human subject requirements and animal care and use requirements. Animal use and care requirements are described in Title 14 of the Code of Federal Regulations (CFR) 1232 <<http://www.ecfr.gov/cgi-bin/text-id?c=ecfr&sid=71a0062be1154606f64ae82ea1550ff1&rgn=div5&view=text&node=14:5.0.1.1.2.2&idno=14>>. NASA and CASIS utilize just-in-time practices for approval of the use of animals. For proposals employing animals, assurance of compliance with animal care and use provisions is required within 90 days after notice of award. If the Institutional Animal Care and Use Committee (IACUC) certification is already approved at proposal submission, attach a copy of the certification as part of the Step-2 proposal. If this certification is pending, a copy must be submitted to CASIS within 90 days after notice of award.

## **Section VI: Biographical Sketch**

*Maximum three pages per biographical sketch*

Supply a biographical sketch for each proposer and background on key collaborators. Include information on past success in the field of study. Specifically describe the research team's experience and expertise relevant to this research project. In addition, please include four sections in the following sequence:

- a. Educational History (in reverse chronology)
- b. Professional Experience
- c. Publications
- d. Current Grant Funding

## **4. PROPOSAL EVALUATION**

### **4.1 Overview of Selection Process**

Step-1 Proposals will be subject to a preliminary evaluation that will result in the encouragement or discouragement of submission of full proposals in Step-2. The evaluation process for solicited Step-2 proposals will include five steps:

1. **Operations Evaluation.** Expedited review by the CASIS Operations team to determine technical feasibility of the proposed project and achievability of the estimated budget and timeline.
2. **Scientific Evaluation.** Evaluation by the Scientific Project Selection Panel (PSP), an external panel of subject matter experts, to score both scientific merit and potential impact.
3. **Economic Evaluation.** A two-pronged economic evaluation led by the CASIS economic team to score potential commercial and intangible value.

4. **Risk and Compliance Review.** Review by the CASIS Compliance Team for regulatory and legal risks.
5. **Final Determination.** The Executive Director, Chief Economist, and Chief Scientist will perform the final prioritization and award determination, initiating discussions with members of the operations/science/economic review teams and CASIS management-level staff as necessary.

If CASIS receives Step-2 proposals with information marked proprietary or confidential, CASIS will take steps to avoid inappropriate use of such information and to avoid conflicts of interest. These steps may include establishing internal firewalls or designating external panel(s) of experts to undertake all or portions of the above evaluation processes.

#### **4.2 Detailed Description of Operations Evaluation**

The CASIS Operations team, who may consult as needed with NASA and outside technical experts, conducts a technical feasibility review of proposals to ensure payload viability and overall readiness/feasibility for flight. This review is an unscored, pass–fail initial screening; however, CASIS may consider an interview with the investigator(s) to clarify technical elements of the proposal as well as the proposed budget and schedule in order to make its determination. Specifically, the technical feasibility review considers the following elements (not a comprehensive list):

- Logistics: Proposed resources including implementation partner support, facility needs for ground testing and flight operations support, use of ISS crew for research support, power and data requirements, weight and any known hazards
- Hardware: Availability, limitations, appropriate planned use and (alternatively) the costs and feasibility of proposed new hardware development
- Projected Budget and Time Frame: Preflight development and testing considerations, time to flight and time to completion
- Hazards: Procedures, situations and materials that could potentially be hazardous and a plan to mitigate any identified issues
- Questions: Follow-up questions for the investigator(s), including as appropriate—
  - Revised methods/analyses, and how results will be collected, analyzed and interpreted
  - Awareness of potential barriers and ideas about alternative approaches

NASA has specified details regarding flight certification requirements, available on the Web at <http://www.iss-casis.org/solicitations>. The Operations team may disqualify proposals that cannot meet these requirements.

Only proposals that demonstrate feasibility will pass this round of review and advance to scientific evaluation. The decision of the Operations review is final and not subject to appeal.

#### **4.3 Detailed Description of Scientific Evaluation**

Using the scoring rubric below, the Scientific Proposal Selection Panel (PSP, an external panel of subject matter experts in the RFP target field, assembled by CASIS) will evaluate feasible proposals that passed the Operations review. The PSP’s evaluation will consider the original proposal and may consider additional information from the Operations evaluation.

## Proposal scoring chart

Score	Descriptive Features	Potential for selection
90-100	EXCELLENT: A thorough, comprehensive, and compelling proposal of exceptional merit that fully responds to the objectives of the RFP, as documented by several major strengths, no major weaknesses, and only very minor weaknesses, if any.	Top priority for selection.
80-89	VERY GOOD: A competent proposal of high merit that fully responds to the objectives of the RFP, as documented by one or more major strengths and no major weaknesses; strengths substantially outweigh any minor weaknesses.	Second priority for selection, barring issues of funding availability or programmatic priorities.
70-79	GOOD: A competent proposal that represents a credible response to the RFP, as documented by no major weaknesses; strengths and weaknesses on the whole are in balance, but strengths somewhat outweigh weaknesses.	May be selected as funds permit according to programmatic priorities.
50-69	FAIR: A proposal that nominally responds to the RFP, in which one or more major weaknesses, in combination with any minor weaknesses, are in balance with its strengths.	May be selected (sometimes after revisions) as funds permit according to programmatic priorities.
0-49	POOR: A proposal having several major weaknesses or weaknesses that constitute fatal flaws.	Not selectable regardless of the availability of funds or programmatic priorities.

**Minor Weakness:** An easily addressable weakness that does not substantially lessen merit/impact.

**Major Weakness:** A weakness that severely limits merit/impact.

### *Scoring Approach*

Reviewers will score the following categories by using the above descriptors and will then average the individual scores to produce an overall merit/impact score.

### *Evaluation Categories and Criteria*

#### 1. Significance

*Descriptors/Criteria:* If successful, the results will have rapid scientific, commercial, and humanitarian impact and significant scientific, commercial, and humanitarian potential. The results could yield a new line of space research with strong scientific, commercial, and humanitarian potential or build on prior successful research produced on the ISS. If successful, the results will advance the leading edge of the field. Negative results will have significant impact within the research area. If successful, the results will influence broad fields of study. The research builds on a foundation of existing space or ground research to bring the pathway closer to commercial application.

## 2. Investigators

*Descriptors/Criteria:* The investigator(s) has the financial stability to complete a project. The investigator(s) has documented success in the field of study (as demonstrated by strong publication record, commercial success, patents, or technology implementation resulting from R&D). The investigator(s) has a strong publication record or demonstrated success in R&D (as measured by commercial success, patents or technology implementation resulting from scientific research). If the applicant is a new investigator(s), or one in the early stages of an independent career, the investigator(s) has appropriate experience and training or has partnered with a qualified coinvestigator. If the project is collaborative (e.g., multiple institutions or coinvestigators), the investigators have complementary and integrated expertise; their leadership approach, governance and organizational structure are appropriate for the project.

## 3. Innovation

*Descriptors/Criteria:* The project is innovative with respect to multidisciplinary integration and novelty of topic or approach. The project's results, if successful, will challenge current research or commercial practice paradigms. The project's concepts, approaches, instrumentation, or interventions are new to more than one field of research. The project improves or suggests a new application of theoretical concepts or approaches.

## 4. Approach

*Descriptors/Criteria:* The scientific merit of the proposal is sound. The proposed project fits the CASIS mission, satisfying the overall objective of the RFP and both the short- and long-term objectives of CASIS. The proposal explains the hypotheses or the required elements of the proposed technology demonstration, including well-defined ground controls. The project requires the space environment for advancement with respect to time and/or capability. The project's potential problems, alternative strategies, and benchmarks for success are presented (may refer to Operations evaluation).

## 5. Environment

*Descriptors/Criteria:* The investigator(s) has access to crucial ground technology and experience necessary for preflight work and ground controls. The proposal contains compelling and well-developed preliminary work. The project will benefit from the space environment. The investigator(s) has demonstrated understanding of how data collection, analysis and interpretation must be approached on the basis of the unique conditions of the space environment (may refer to Operations evaluation).

### **4.4 Detailed Description of Economic Evaluation**

CASIS will assemble a team of qualified personnel to serve as the economic team to evaluate the feasible proposals that passed the Operations and Scientific reviews. The economic review process will be twofold, with each branch of the process (Commercial and Intangibles) using a 0–100 scale (100 being the best) to evaluate the criteria within its area. Reviewers will score each of eight categories using the criteria and scoring descriptors detailed in this document—five categories in the commercial evaluation branch of review and three in the intangibles branch. The scores within each branch will be averaged to produce an overall score for that branch. The weighting of the intangible score in the final combined score will range from 0 to 50%, as determined by the CASIS Chief Scientist and/or Chief Economist.

## Proposal scoring chart

Score	Descriptive Features	Potential for selection
90-100	EXCELLENT: A thorough, comprehensive, and compelling proposal of exceptional merit that fully responds to the objectives of the RFP, as documented by several major strengths, no major weaknesses, and only very minor weaknesses, if any.	Top priority for selection.
80-89	VERY GOOD: A competent proposal of high merit that fully responds to the objectives of the RFP, as documented by one or more major strengths and no major weaknesses; strengths substantially outweigh any minor weaknesses.	Second priority for selection, barring issues of funding availability or programmatic priorities.
70-79	GOOD: A competent proposal that represents a credible response to the RFP, as documented by no major weaknesses; strengths and weaknesses on the whole are in balance, but strengths somewhat outweigh weaknesses.	May be selected as funds permit according to programmatic priorities.
50-69	FAIR: A proposal that nominally responds to the RFP, in which one or more major weaknesses, in combination with any minor weaknesses, are in balance with its strengths.	May be selected (sometimes after revisions) as funds permit according to programmatic priorities.
0-49	POOR: A proposal having several major weaknesses or weaknesses that constitute fatal flaws.	Not selectable regardless of programmatic priorities or availability of funds.

**Minor Weakness:** An easily addressable weakness that does not substantially lessen economic value.

**Major Weakness:** A weakness that severely limits economic value.

### 4.4.1 Commercial Evaluation

Note: Reviewers will evaluate commercial letters of support during this stage. These letters may influence scoring in multiple categories.

#### *Evaluation Categories and Criteria*

#### 1. Management and Key Employees

*Descriptors/Criteria:* The current management team is qualified to and can execute the project. The team has prior successful experience working together. The team or PI has prior experience in similar capacities (however, the team or PI cannot be faulted for lack of space experience) and has demonstrated high likelihood of future success in the field of interest. The project lists necessary, relevant, and qualified key collaborators.

#### 2. Markets and Competition

*Descriptors/Criteria:* The current size and forecast growth rate of the relevant market(s) is noted and addressed, and these data support potential market impact of successful results. The proposal addresses both barriers to entry and market competition. The team can either commercialize products

or partner with companies with established commercial success. A customer base exists for potential products (i.e., new innovation vs. advancing something existing or solving a problem).

### 3. Products/Services and Technologies

*Descriptors/Criteria:* The products/services/key technologies that will benefit from successful results are clearly defined, feasible, and unique. The resulting product/service will provide specific and significant benefits to the U.S. economy or population. Customers will easily understand the benefits/products resulting from successful results. Product/service development plan, timing, and costs are feasible and realistic. Technology risk assessment, if applicable, has been performed and/or is not likely to pose a problem. Patents, trade secrets, or copyright protection, if available for the products/technologies/services, will increase likelihood of market impact and commercial success.

### 4. Business and Operating Plan

*Descriptors/Criteria:* The proposal coherently states project mission, strategy, and implementation. The competitive environment and CASIS objectives are clearly understood. Required resources (e.g., human, capital) are described and understood. The description of commercial application is adequate, and the forecast results are reasonable.

### 5. Customers and Suppliers

*Descriptors/Criteria:* Customer opinion about the field/market/competition is favorable to market entry and success. Key suppliers are stable and reliable/high quality (if applicable). Single-source components or technologies are unlikely or are acceptable (if applicable). Investigators are aware of companies interested in commercializing the product(s) resulting from the research.

## 4.4.2 Intangibles Evaluation

### *Evaluation Categories and Criteria*

#### 1. Greater Good to Society

*Descriptors/Criteria:* The overall potential for impact on the U.S. society is of significant value. The project advances discovery and understanding while promoting teaching, training, and learning. The proposed project broadens the participation of underrepresented groups. The project increases throughput of the supply chain—innovations affecting humans, animals, plants, climate and resources now or in the future (e.g., fewer deaths, fewer sicknesses, healthier livestock, a more abundant food supply, the protection of endangered plant or animal species, reduced pollution, improved ground energy efficiency).

#### 2. U.S. Leadership in Space

*Descriptors/Criteria:* The success of the project will change the concepts, methods, technologies, treatments, services, or interventions that drive the relevant field. Potential exists for significant international impact. The project advances CASIS goals to balance a diverse portfolio of research disciplines and stages. The project enhances awareness among potential ISS constituency groups regarding the advantages of performing science in space (i.e., it will promote interest in using the ISS

National Lab). The project shows how ISS technology contributes to products and services revenue and related tax revenue from profits (i.e., it demonstrates value to the public).

### 3. Economic and Human Capital Development

*Descriptors/Criteria:* The benefits of the proposed project to society include job and wealth creation, as well as improved quality of life, knowledge, skill sets and sustainability. The project bridges basic science with industrial R&D applications. Project success will enhance the infrastructure for space-based research and education (e.g., facilities, instrumentation, networks, and partnerships). The results will be disseminated broadly to enhance scientific and technological understanding, enabling developments in science by allowing researchers to build on each other's work and providing content for educational curricula. Project success will produce future projects of significant intangible or tangible value. The project addresses an important problem or a critical barrier to progress in the field.

#### 4.5 Risk and Compliance Review

During or after the economic review, the CASIS Compliance team will review meritorious projects providing notes regarding potential problems for risk and compliance: data integrity, ethics and research integrity, regulatory compliance, conflicts of interest and other risks or liability.

#### 4.6 Final Determination

The Executive Director, Chief Economist, and Chief Scientist will perform the final prioritization and award determination, initiating discussions with members of the operations/science/economic review teams and CASIS management-level staff as necessary.

The Executive Director, Chief Economist, and Chief Scientist will meet and review the eligible projects, relative to the entire ISS National Lab research portfolio, on the basis of scientific merit/value, economic impact, technology advancement, and educational value. They will consider estimated cost and timeline alongside scores and comments from all review steps.

The Executive Director, Chief Economist, and Chief Scientist will analyze the Operations evaluation of proposals to ensure sufficient facility capacity and on-board resources in the given increment. Based on the facility and resource requirements known at the time of prioritization, they will categorize and organize payloads accordingly, consulting CASIS Operations staff as necessary for clarification. If all eligible projects fall within the available CASIS resources and facility capacity, then prioritization, for this purpose, would not be necessary. If unforeseen changes to available resources occur, CASIS will reprioritize the payloads.

All projects must meet minimum eligibility requirements such as readiness for an increment, secured funding (including CASIS grant funding), and an agreement with an implementation partner. Prioritized proposals with sufficient funding will advance to the CASIS Operations team for preflight activity and project management. CASIS Operations staff will participate in NASA research processes to support established strategic and tactical planning processes.

Lower priority proposals will be notified that their project needs improvement with feedback on its weaknesses.

#### **4.7 Procedure for Conducting Negotiations**

After completion of the evaluation process described above, CASIS will determine whether there are proposers with whom CASIS may choose to conduct negotiations. If CASIS chooses to negotiate with proposers, negotiations shall continue to the satisfaction of CASIS or, if CASIS determines a satisfactory agreement cannot be reached, CASIS may initiate negotiations with other proposers. CASIS may, at any time during the negotiation process, choose to negotiate with one or more proposers at the same time, but is under no obligation to do so. CASIS may request a revised proposal from any proposer to elicit additional information that is required.

In the event that (i) CASIS decides not to engage in any negotiations, or (ii) a grant award cannot be negotiated with any of the proposers, CASIS may issue a new RFP or utilize another process to seek qualified grantees.

#### **4.8 Appeals**

CASIS shall inform all proposers whether they have been selected for a grant award. CASIS shall inform all non-selected proposers of the bases for the decision. Any proposer who is adversely affected by CASIS's decision concerning a grant award and who wants to appeal such decision shall submit a written appeal to the Executive Director of CASIS within 10 days of the date on which the proposer is informed of the bases for CASIS's decision. This appeal shall consist of a written statement of up to 10 pages setting forth the bases for the proposer's appeal. The appeal shall be considered by a member of the CASIS senior management who was not involved in the decision making. Failure to file an appeal within the prescribed time shall preclude any appeal.

#### **4.9 Resulting Grant Agreements and/or User Agreements**

Upon selection of a proposal for award, CASIS and the proposer will execute a grant agreement with terms and conditions as set forth in RFP Section 5. The award of a grant or user agreement does not guarantee the grantee that its payload will be flown on the ISS. At an appropriate time to be set forth in the grant or user agreement, CASIS, with input from NASA, will make a determination as to whether the grantee's project is flight-capable. CASIS, with input from NASA, shall determine the launch priority to be given to each grantee's project.

#### **4.10 Progress Reports**

Grantee will submit progress reports in six-month intervals.

Many milestones and required preflight activities will take place in collaboration with implementation partners—interactions that CASIS will facilitate. Whether grantees reach these milestones directly or in collaboration with service providers, progress reports must document completion. Each report must include the following:

- An overview of grant expenditures and financial records, categorizing expenses using the same categories as employed in the proposal. Reports should note any anticipated future changes to the originally proposed budget.
- Status of each projected milestone in the proposal or grant agreement, including analysis of any unmet milestones. (For unmet milestones, grantees may have to meet with CASIS Operations staff to develop a plan to meet project objectives within the required timeline.)

- Identified resources for ground-based preflight and postflight activities.
- Results and relevant information from preflight activities, ground testing and on-orbit testing, including any changes in proposed experimental methodology or data analysis and processing.
- Development and testing status of required payload integration products, including elements to be flight certified (e.g., hardware, software, delivery timeline).
- When appropriate, status of development, testing and operation of hardware and products.
- Details confirming that flight research and development complies with NASA's ISS payload requirements and all NASA rules and regulations of such activity.
- Information and data for consideration in the CASIS review process.

#### **4.11 Final Report**

At the completion of the project, each grantee will submit a final report that addresses the following additional items:

- A listing of each objective in the original proposal.
- The extent to which the project achieved each objective and, for unmet objectives or expectations, an analysis of underlying issues and assumptions that may have influenced the unexpected outcome.
- A listing, from the investigator perspective, of each new finding that can be traced to methods or approaches developed in the funded work. The list should note any new outcomes related to microgravity or other flight-related variables.
- How the work benefits scientific advancement and/or commercial potential:
  - The status of the project's influence on the greater U.S. population, as described in the initial proposal (i.e., scientific and economic impact).
  - Discuss future directions for commercialization, if applicable, or for disseminating results, moving forward with the scientific or other relevant pathways.
  - A list of publications submitted or published.

## **5. MISCELLANEOUS PROVISIONS**

### **5.1 Provisions Governing Grant Award**

1. A response to this RFP does not commit CASIS to award a grant or to pay any costs incurred in the preparation of a response. CASIS reserves the right to accept or reject any or all responses received or to cancel this RFP.
2. CASIS is not liable for any costs incurred by a proposer in responding to this RFP.
3. A material misrepresentation in a proposal shall result in the rejection of the proposal, and shall be grounds for termination of any grant award.
4. Proposers shall not offer or exchange any gratuities, favors or anything of monetary value to or with any Board member, employee, consultant of CASIS or any Project Selection Panel member for the purpose of influencing the disposition of their proposal.
5. Proposers shall not engage in any activity that will restrict or eliminate competition in response to this RFP. This prohibition does not preclude joint ventures or subcontracting.
6. Proposers must be familiar with Section 504 of the NASA Authorization Act of 2010 and other applicable laws, regulations and government requirements. All grantees will be required to comply with all such laws, regulations and government requirements.
7. Proposals and reviewer comments will be maintained by CASIS securely and will be exempt from disclosure or release, unless required by law.

## **5.2 Grant Period**

This Agreement becomes effective on the date on which it is executed and will continue for a period of 18 months, unless extended by mutual agreement of the Parties in writing. Grantee's project(s) must be ready to fly within 12 months of the effective date of the Agreement, and projects must be completed (with final report submitted) by 6 months post flight.

## **5.3 Funding of Grant**

CASIS's liability to make payments to the grantee will be limited to the funds awarded as set forth in the grant agreement. All activities under or pursuant to the grant agreement outside the federal fiscal year under which the award was granted are subject to the availability of federal funds and are subject to CASIS receiving funding through its cooperative agreement with NASA.

## **5.4 Modifications to Grant**

Grants awarded as a result of this RFP may be modified or extended upon agreement of the grantee and CASIS. CASIS may negotiate an increase in grant funding based on funds available or if it is in the best interest of CASIS. CASIS may unilaterally modify a grant agreement to de-obligate funds if funding becomes unavailable or if it is in the best interest of CASIS.

## **5.5 Payments**

Grant funds will be transmitted using bill.com as either an e-payment (Automated Clearing House – ACH) or a physical check issued by CASIS. Before funds are transmitted, CASIS will require the following information: grantee's bank, bank routing number and account number; complete and signed W-9, and contact name, e-mail address and phone number to confirm a test banking transaction. Once this information is received, a test transaction will be conducted and confirmed by grantee. Payments will be made in amounts and at times as set forth in the grant agreement. CASIS is not liable for any expenses incurred by grantee above the awarded grant amounts.

## **5.6 Grant Terms and Conditions**

Upon selection of a proposal for award, CASIS and the proposer will execute a grant agreement with terms and conditions including, but not limited to, those set forth in this section and at the following link: [Terms and Conditions](#)

The award of a grant or user agreement does not guarantee the grantee that its payload will be flown on the ISS. At an appropriate time to be set forth in the grant or user agreement, CASIS, with input from NASA, will make a determination as to whether the grantee's project is flight-capable. If the project is determined to be flight capable, then CASIS, with input from NASA, shall determine the launch priority given to each project.

## **5.7 Termination**

The grant agreement may be terminated in whole or in part if any of the following conditions have occurred:

1. By CASIS, if CASIS determines that grantee fails to comply with any material requirement of the grant agreement;
2. By CASIS, if CASIS determines that the action or inaction of the grantee substantially endangers the performance of the grant agreement or such occurrence can be reasonably anticipated;
3. By either party, if CASIS and the grantee mutually agree to complete or partial termination; or
4. By grantee, upon grantee's sending to CASIS written notification setting forth the reasons for the termination, the effective date and, in the event of a partial termination, the portion to be terminated. However, if CASIS determines in the case of partial termination that the reduced or modified portion of the grant will not accomplish the purposes for which the grant was made, it may terminate the grant in its entirety under sections 1, 2, or 3 above.

Grantees shall submit to CASIS, within 90 calendar days after the date of any termination, all financial, performance, and other reports as required by the terms and conditions of the grant agreement.

**ATTACHMENT A: STEP-1 PROPOSAL FORM**

In the summer of 2011, NASA selected CASIS, a nonprofit organization, to maximize use of the International Space Station U.S. National Laboratory for improving life on Earth. While NASA continues to support ISS research to advance space exploration goals, the ISS National Lab space managed by CASIS is focused on research and technology development with ground benefits: exploiting the space environment to advance basic science and translational research with commercial application for the improvement of life on Earth. CASIS facilitates use of the ISS National Lab by non-NASA U.S. government agencies and by academic and private institutions, providing access to the laboratory’s permanent microgravity setting and vantage point in low Earth orbit as well as the varied environments of space.

**The form included below is an example of the Step-1 Proposal Form and is not for submission. All Step-1 proposals must be submitted through the CASIS website as explained in Section 3.1 of this document. Please complete the online form to submit Step-1 of the proposal submission process. All fields are required unless marked as “optional.” Do not include confidential or proprietary information.**

Project Title \_\_\_\_\_

Principal Investigator \_\_\_\_\_

    Phone \_\_\_\_\_

    Email \_\_\_\_\_

    Address \_\_\_\_\_

Entity Name \_\_\_\_\_

Entity Location \_\_\_\_\_

*Note: Non-U.S. entities must have a U.S.-based partner to submit a proposal. CASIS cannot consider projects using only non-U.S. sponsorship.*

**I. GENERAL INFORMATION**

Hypothesis

Clearly state the hypothesis. If the project is hardware development or technology demonstration, a short statement of objective is appropriate.

Key words (for indexing purposes)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_

Team Members

- |                      |              |
|----------------------|--------------|
| 1. Name, Title _____ | Entity _____ |
| 2. Name, Title _____ | Entity _____ |
| 3. Name, Title _____ | Entity _____ |
| 4. Name, Title _____ | Entity _____ |

Does your team include any NASA employees?      Yes  No

*Note: As described in Section 2.6, CASIS cannot award funding to NASA employees.*

Does your team include any international collaborators?      Yes  No

If so, please list: Entity \_\_\_\_\_ Role \_\_\_\_\_

Commercial Partners

- |                       |                        |
|-----------------------|------------------------|
| 1. Organization _____ | Point of Contact _____ |
| 2. Organization _____ | Point of Contact _____ |
| 3. Organization _____ | Point of Contact _____ |
| 4. Organization _____ | Point of Contact _____ |

Has this proposal previously been reviewed by another funding agency?      Yes  No

If so, please list the agency and attach the previous review: \_\_\_\_\_

Have you previously submitted a proposal to CASIS?      Yes  No

Will your project require IRB/IACUC approval?      Yes  No

*Note: For proposals employing animals, assurance of compliance with animal care and use provisions is required as described in Section 3.5 sub-section V of this document.*

Estimated Project Timeline in Months from Award Selection

Preflight development and testing      \_\_\_ months

Time to flight      \_\_\_ months

Time to completion      \_\_\_ months

Proposed Implementation Partner \_\_\_\_\_ (optional)

## II. COMMERCIAL RELEVANCE

*This section should describe the potential influence of the project on specific commercial sectors.*

### Downstream Applications

What are the potential downstream commercial Earth applications of your project? If the research project addresses primarily fundamental science questions, explain the importance of the project toward knowledge advancement in applicable fields and the long-term path/timeline to a tangible product, healthcare advancement, or intangible benefit to the U.S. population.

Estimated Time to Market \_\_\_\_\_ (optional)  
*(i.e., time for research to translate into commercial application)*

List Relevant Commercial Sectors	Estimate Addressable Market Size

## III. PROJECT DETAILS

Does this submission include proprietary information? Yes  No

*Note: Step-1 proposal submissions containing confidential or proprietary information will not be accepted.*

Is the project ground-based or space-based? Ground  Space

### Necessity of the National Lab

If the project is space-based, why does your project require the ISS National Lab? Clearly state why the space environment is necessary and/or superior to a ground-based approach.

If the project is ground-based, how does your project enable and/or enhance utilization of the ISS National Lab?

### Responsiveness to RFP

Please be succinct: Describe why your project is responsive to the RFP; in this case, briefly state why your project enables future ISS National Lab research.

### Required Materials/Hardware

List any materials/hardware that must be flown to the ISS in order to complete the project.

### Earth Benefits

What is the relevance of the proposed space-based research to ground applications (e.g., healthcare advancements, commercial product development—in agreement with the CASIS mission to use the ISS National Lab for benefits to life on Earth)?

Please be succinct: This may overlap somewhat with Section II. **Reminder: Projects enabling space exploration goals are supported by NASA, not CASIS, and will be considered unresponsive to this RFP.**

### Project Summary

**1000 words maximum.**

Please describe the proposed project. An abstract and specific aims are appropriate, but alternate formatting/organization is also acceptable.

**ATTACHMENT B: STEP-2 PROPOSAL COVER SHEET**

**PROPOSAL OF [NAME]**

**IN RESPONSE TO**

Request for Proposal No. CASIS 2014-2

Enabling Technology To Support Science in Space For Life On Earth

Title of Proposal:

Proposer Name:

Proposer Address:

Federal Tax Identification Number:

Contact Information:

1. Name, title, phone number and address of person who can respond to inquiries regarding the proposal
2. Name of Principal Investigator/Project Director

**ATTACHMENT C: CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

*This certification is required by 2 CFR Part 180, implementing Executive Orders 12549 and 12689, regarding debarment and suspension.*

- (1) The prospective participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

---

Name and Title of Authorized Representative

---

Signature

---

Date

### Attachment D: Budget Template For Step-2 Proposals

CASIS Project:	Enabling Technology																		
Principal Investigator:																			
Company/Institution:																			
Project Budget																			
	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Total
Salary and fringe benefits for personnel																			\$ -
Equipment and supplies																			\$ -
Consultant costs																			\$ -
Alterations and renovations																			\$ -
Publications/misc. costs																			\$ -
Contract services																			\$ -
Consortium costs																			\$ -
Travel expenses																			\$ -
Implementation partner services/hardware integration																			\$ -
Indirect Costs																			\$ -
<b>Total Cost</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
Total Cost-Cumulative	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CASIS Funding	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Funding Surplus (Deficit)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

A detailed explanation identifying specific costs associated with each budgeted line item must be provided.