

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)  
HEADQUARTERS  
SCIENCE MISSION DIRECTORATE

RESEARCH OPPORTUNITIES IN SPACE AND EARTH SCIENCES – 2016  
(ROSES-2016)

NASA RESEARCH ANNOUNCEMENT (NRA)  
SOLICITING BASIC AND APPLIED RESEARCH PROPOSALS  
NNH16ZDA001N

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA) NUMBER: 43.001

ISSUED: FEBRUARY 19, 2016

FULL (STEP-2) PROPOSALS DUE  
STARTING NO EARLIER THAN APRIL 22, 2016  
THROUGH NO LATER THAN JUNE 1, 2017

**August 18, 2016: The final Section of Table 1 on separately uploaded HEC and Total Budget files was reformatted to make explicit that the Total Budget is a separately uploaded document and not part of the detailed budget section in the proposal PDF.**

**Amended March 24, 2016: Section IV(b)(iii) on redaction of salaries and indirect costs from peer reviewers and Table 1 have been updated to explicitly state that a "Total Budget" file uploaded separately from the proposal document is required, see [Section IV\(b\)\(iii\)](#). New text is in bold, deleted text is struck through.**

## RESEARCH OPPORTUNITIES IN SPACE AND EARTH SCIENCES (ROSES)–2016

### EXECUTIVE SUMMARY

This National Aeronautics and Space Administration (NASA) Research Announcement (NRA), Research Opportunities in Space and Earth Sciences (ROSES) –2016, solicits basic and applied research in support of NASA’s Science Mission Directorate (SMD). ROSES is an omnibus NRA, with many individual program elements, each with its own due dates and topics. All together these cover the wide range of basic and applied supporting research and technology in space and Earth sciences supported by SMD.

Awards range from under \$100K per year for focused, limited efforts (e.g., data analysis) to more than \$1M per year for extensive activities (e.g., development of specialized science experimental hardware). The funds available for awards in each program element offered in this NRA range from less than one to several million dollars, which allow selection from a few to as many as several dozen proposals, depending on the program objectives and the submission of proposals of merit. Awards will be made as grants, cooperative agreements, contracts, and inter- or intraagency transfers, depending on the nature of the work proposed, the proposing organization, and/or program requirements. The typical period of performance for an award is three years, but some programs may allow up to five years and others specify shorter periods. Organizations of every type, domestic and foreign, Government and private, for profit and not-for-profit, may submit proposals without restriction on teaming arrangements. Note that it is NASA policy that all investigations involving non-U.S. organizations will be conducted on the basis of no exchange of funds.

Details of the solicited program elements are given in the Appendices of this NRA. Proposal due dates are given in Tables 2 and 3 of this NRA, which will be posted at <http://nspires.nasaprs.com/> and for which links are provided below. Interested proposers should monitor <http://nspires.nasaprs.com/> or subscribe to the SMD electronic notification system there for additional new program elements or amendments to this NRA through February 2017, at which time release of a subsequent ROSES NRA is planned. A web archive (and RSS feed) for amendments, clarifications, and corrections to ROSES-2016 will be available at: <http://nasascience.nasa.gov/researchers/sara/grant-solicitations/roses-2016/>. This NRA will be available upon its release at <http://solicitation.nasaprs.com/ROSES2016>.

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Note: [Table 2](#) and [Table 3](#) of this NRA are posted and updated as separate html documents on the web and can be reached either by following the hypertext links above embedded in the electronic version of this document, or at <http://solicitation.nasaprs.com/ROSES2016table2> and <http://solicitation.nasaprs.com/ROSES2016table3>, respectively, or by going to <http://solicitation.nasaprs.com/ROSES2016> and following the links there.

## RESEARCH OPPORTUNITIES IN SPACE AND EARTH SCIENCES (ROSES)–2016

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Note: Any amendments to the Table of Contents for Appendices A through E will be indicated as red in [Table 2](#) and [Table 3](#) of this NRA, which are posted and updated as separate html documents on the web. These can be reached either by following the hypertext links above embedded in the electronic version of this document, at <http://solicitation.nasaprs.com/ROSES2016table2> and <http://solicitation.nasaprs.com/ROSES2016table3>, respectively, or by going to <http://solicitation.nasaprs.com/ROSES2016> and following links there. Potential proposers may receive notification of amendments to ROSES-2016 by signing up for the SMD NSPIRES mailing list and/or by signing up for the ROSES-2016 RSS feed at <https://admin.science.nasa.gov/researchers/sara/grant-solicitations/roses-2016/>

# RESEARCH OPPORTUNITIES IN SPACE AND EARTH SCIENCES (ROSES)–2016

## SUMMARY OF SOLICITATION

### I. FUNDING OPPORTUNITY DESCRIPTION

#### (a) Strategic Objectives of NASA’s Research Program

The National Aeronautics and Space Administration (NASA) is chartered in the National Aeronautics and Space Act [51 U.S.C. § 20101 et seq.] with, among other objectives, the expansion of human knowledge of the Earth and of phenomena in the atmosphere and space. Working from this Congressional authorization, U.S. National Space Policy directs NASA to execute a sustained and affordable human and robotic space exploration program and develop, acquire, and use civil space systems to advance fundamental scientific knowledge of our Earth system, solar system, and the universe. This direction allows the science objectives of the NASA Science Mission Directorate (SMD) to be clearly defined as the orderly pursuit of the Agency’s strategic direction.

The [2014 NASA Strategic Plan](#) identifies the following strategic objectives as those to be pursued by SMD:

- Understand the Sun and its interactions with Earth and the solar system, including space weather;
- Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere;
- Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars; and,
- Advance knowledge of Earth as a system to meet the challenges of environmental change and to improve life on our planet.

Further insight into SMD’s Strategic Goals and Objectives (from the 2014 Strategic plan) and the Questions and Goals in the 2014 Science Plan, are given in the documents at <http://science.nasa.gov/about-us/science-strategy/>. All program elements in this NASA Research Announcement (NRA) are relevant to NASA’s Strategic Goals and Objectives. Each proposal to this NRA demonstrates its relevance of the proposed research to NASA by demonstrating relevance to the particular program element to which it was submitted (further instructions concerning relevance and the other evaluation criteria are provided in Section VI (a) below).

#### (b) Research Programs of NASA’s Science Mission Directorate

The NASA Science Mission Directorate (SMD) pursues NASA’s strategic objectives using a wide variety of space flight programs that enable the execution of both remote sensing and *in situ* investigations. These investigations are carried out through flight of space missions in Earth orbit, as well as to or even beyond objects in the solar system, and also through ground-based research activities that directly support these space missions. This ROSES NASA Research Announcement (NRA) solicits proposals for both flight investigations, using suborbital-class platforms (including aircraft, balloons, sounding rockets, CubeSats, commercial suborbital reusable launch vehicles, and small International Space Station (ISS) payloads), and all kinds of ground-based supporting research and technology (SR&T) investigations that seek to understand naturally occurring space and Earth phenomena, human-induced changes in the Earth system, and Earth and space science-related technologies and to support the national goals for further

robotic and human exploration of space. These ground-based investigations include, but are not limited to: theory, modeling, and analysis of SMD science data, development of concepts, techniques and advanced technologies suitable for future SMD space missions; development of methods for laboratory analysis of both extraterrestrial samples returned by spacecraft and terrestrial samples that support or otherwise help verify observations from missions; determination of atomic and composition parameters needed to analyze space data, as well as returned samples from the Earth or space; Earth surface observations and field campaigns that support SMD science missions; development of integrated Earth system models; development of systems for applying Earth science research data to societal needs; and development of applied information systems applicable to SMD objectives and data.

Proposals in response to this NRA should be submitted to the most relevant science program elements described in Appendices A, B, C, D, and E. [Table 2](#) lists these program elements in the order of their calendar deadlines for the submission of proposals, while [Table 3](#) lists them in the order in which they appear in the appendices of this NRA. Questions about each specific program element should be directed to the Program Officer(s) identified in the Summary of Key Information section that concludes each program element description.

In order to pursue NASA's strategic objectives, SMD research activities are organized into four Research Programs:

- The Earth Science Research Program sponsors research to explore interactions among the major components of the Earth system — continents, oceans, atmosphere, ice, and life — to distinguish natural from human-induced causes of change and to understand and predict the consequences of change.
- The Heliophysics Research Program sponsors research to understand the Sun as a magnetic variable star and its effects on the Earth and other planets and the dynamics of structures in the solar system.
- The Planetary Science Research Program sponsors research to explore the solar system to study its origins and evolution, including the origins of life within it.
- The Astrophysics Research Program sponsors research to explore the universe beyond, from the search for planets and life in other solar systems to the origin, evolution, structure, and destiny of the universe itself.

The program elements in Appendices A, B, C, and D describe program elements of these four science research programs, respectively, while Appendix E describes cross-division program elements relevant to two or more of these science research programs. Each of these appendices is prefaced with an Overview section that provides an introduction to the research program content that all interested applicants to this NRA are encouraged to read.

The program elements described in these appendices also provide any clarifications or modifications to the general guidelines contained in this *Summary of Solicitation*.

#### (c) Significant Changes from Recent ROSES

Proposers should be aware of the following significant changes in this NRA from last year:

- Salaries for all participants and overhead from all types of organizations must be included in the web cover page budget. This applies to NASA civil servants. See [Section IV \(b\) iii](#).

- For all participants and all types of organizations, salaries and overhead may not be included anywhere in the body of the proposal. See Section [IV \(b\) iii](#).
- [Section I \(h\)](#) has been added which describes what proposers should do when there are conflicts between ROSES vs. the Guidebook vs. Program Elements.
- Information about requested High-End Computing resources will be collected on the NSPIRES cover pages and as a separate, uploaded PDF document, see Section I (d), below.
- Table 1 indicates that CVs for collaborators are permitted, though discouraged in general.
- Table 1 indicates that Current and Pending Support are not required for Students or Foreign Co-Investigators (Co-Is) (since their organization already provides a letter attesting to their availability).
- Table 1 indicates that Current and Pending Support is required only for funded Co-Is at or above 10% of that person's time (0.1 FTE).
- ROSES requires submission of Data Management Plans (DMPs) along with almost all proposals, see [Section II \(c\)](#). For select instrument development programs DMPs are not required under the presumption that no significant research data will be generated. However, if those awards do result in peer reviewed publications, then those must still meet the requirement that the data behind figures and tables be available electronically at the time of publication, ideally in supplementary material with the article.
- NASA anticipates that, starting in 2016, award recipients will be required to archive all as accepted manuscript versions of publications that result from NASA awards in the [National Institutes of Health PubMed Central](#) full-text archive. This requirement will not go into effect until it is included in the terms and conditions of the research awards. Details and instructions for archiving manuscripts will be fully described in future grant information circulars, Frequently Asked Questions (FAQs) and other official Agency announcements and training materials.
- A number of changes have occurred in Appendix B: Three new Program Elements have been added (B.8-10) and B.2 Heliophysics Supporting Research (H-SR) will employ a "binding" two-step proposal submission process; only those proposals that pass threshold review can be submitted as Step-2 proposals. See the individual Program Elements for more information.
- A number of changes have occurred in Appendix C: The Overview in C.1 has been rewritten, Program Element Habitable Worlds is now a cross-division program between Planetary Science and Astrophysics and is located in Program Element E.4, and new Program Element C.19 New Frontiers Data Analysis is listed as TBD and will be added to Appendix C via Amendment. Much of Appendix C now invokes more stringent DMP requirements. See C.1 and the individual Program Elements for more information.
- A couple of changes have been made to Appendix D: Two new Program Elements have been added (D.10 and 11).
- Much of Appendix C has been added to the list of program elements that will not award contracts because it would not be appropriate for the nature of the work solicited. See Section II (a) for more information.

- As always, small changes have been made throughout this document and the associated Program Elements, so please read them carefully well in advance of the proposal due date.

Individuals who did not propose last year should be aware of the following features of note in this NRA, most of which are changes made in recent years:

- Table 1 became a checklist for proposers in 2015. It is to be hoped that this is helpful and will diminish the frequency of noncompliant proposals.
- In 2015, the *Guidebook for Proposers* moved the mandatory table of personnel and work effort out of the budget section and noted that any time commitment included that is not funded by NASA is not considered cost sharing, as defined in 2 CFR §200.29. The *Guidebook* applies this rule to grants, not contracts. This table of work effort, which is not in either the page limited technical/scientific section nor in the budget, is merely a reporting of all of the planned work commitment, funded by NASA or not. This is distinct from the page limited technical/scientific proposal, which should describe what work each team member will be doing. See Table 1.
- In 2015, what was Section IV(e) "Proposal Requirements for Relevance" in prior ROSES incorporated into an expanded and clarified Section VI. "Proposal Review Information".
- What was Section II(b) "Successor Proposals and Resubmissions" in prior ROSES was moved to I(g), clarified, and renamed "Successor, Resubmitted, Multiple and Duplicate Proposals" in 2015. This section includes restrictions on submissions.
- Section V, Suborbital-Class Investigations, was reorganized in ROSES-2015 to remove redundancy and it retains the form that it took last year.
- The Planetary Science Division Research Program was restructured in 2014 and the ROSES-2014 structure has been maintained into ROSES-2016, as can be seen in the Table of Contents for Appendix C. Unless otherwise specified, program elements in Appendix C will continue to use a two-step submission process that requires submission of a Step-1 proposal by the institution. See Section IV(b)vii of this *Summary of Solicitation*, Section 2 of Appendix C.1, and the individual program elements for details.
- The Cross-Division Program supported by the Astrophysics and Planetary Science Divisions, formerly known as "Origins of Solar Systems," was changed to the Exoplanets Research Program in 2014. See Appendix E.3 for details
- In accordance with restrictions in Appropriation Acts, NASA cannot support bilateral participation, collaboration, or coordination with China or any Chinese-owned company or entity, whether funded or performed under a no-exchange-of-funds arrangement. See Section III (c) on restrictions involving China.
- Unsolicited proposals for topical workshops, symposia, conferences, and other scientific/technical meetings will not be accepted. Proposals for such events should be submitted to the few program elements that include it or in response to the Topical Workshops, Symposia, and Conferences program element found in Appendix E.2.
- Note in Section VII (c) that NASA funded projects that receive assistance from the U.S. Antarctic Program (USAP) should explicitly acknowledge USAP.

Proposers may also refer to the ROSES FAQ at <http://science.nasa.gov/researchers/sara/faqs/>. In addition to the listed significant changes, this NRA and the *NASA Guidebook for Proposers Responding to a NASA Research Announcement or Cooperative Agreements Notice* (hereafter referred to as the *NASA Guidebook for Proposers* or simply the *Guidebook*) incorporate a large number of additional changes, including both policy changes and changes to proposal submission requirements. Many sections of both documents have been clarified since last year. All proposers are urged to carefully read this NRA and the latest edition of the *NASA Guidebook for Proposers*, since all proposals must comply with their requirements, constraints, and guidelines.

#### (d) NASA-Provided High-End Computing (HEC) Resources

SMD provides a specialized computational infrastructure to support its research community, managed on its behalf by NASA's High-End Computing (HEC) program (see the HEC website at <http://www.hec.nasa.gov/>). Two major computing facilities are offered, namely, the NASA Center for Climate Simulation (NCCS) at the Goddard Space Flight Center (GSFC), and the NASA Advanced Supercomputing (NAS) facility at the Ames Research Center (ARC).

The HEC program facilities maintain a range of computing systems with significant data storage resources. These offerings are summarized at <http://www.hec.nasa.gov/about/overview.html>. Augmentation and refreshment of these central systems occur on a periodic basis. The HEC program also provides assistance in code porting, performance tuning, scientific data visualization, and data transfer.

Any need for computing time and other HEC program resources for the proposed research must be explicitly justified, using the template described below, in no more than one page, which will not be counted toward the maximum page limit for a proposal. At a minimum, this justification must include how the computational resources would support the investigation and a multi-year resource-phasing plan, in annual increments, identifying the computing time and data storage requirements and the preferred location (facility) where the computational project will be accomplished for the duration of the proposed award period.

A template for populating the multi-year phasing plan is available on the HEC Website at [http://www.hec.nasa.gov/request/science\\_call.html](http://www.hec.nasa.gov/request/science_call.html). The completed template should be converted to PDF and submitted as a separate appendix document. For proposals submitted via NSPIRES, the document should be uploaded using the "Appendix" document type. For proposals submitted via [Grants.gov](http://Grants.gov) it should be attached as an appendix to any appropriate form location. Note that this requirement for a separate document supersedes the general rule in IV(b)(i) for provision of only a single PDF file. Note, computing time must be described in the plan using Standard Billing Units (SBUs), a common unit of measurement employed by the HEC program for allocating and tracking computing usage across its various architectures. SBU Conversion Factors are available at <http://www.hec.nasa.gov/user/policies/sbus.html>. Proposers may also contact HEC support staff for further assistance calculating SBUs; contact information can be found at [http://www.nas.nasa.gov/hecc/support/user\\_support.html](http://www.nas.nasa.gov/hecc/support/user_support.html) for NAS User Support, and <https://www.nccs.nasa.gov/index.html> for NCCS User Services Group.

In addition, proposers must indicate on the NSPIRES Cover Page that a request for computing resources is included in the proposal.

As they review the intrinsic merit of the proposed investigation, science peer review panels will be asked to consider the realism and reasonableness of the computing time request and whether it is an appropriate utilization of the highly constrained resources dedicated for each program element under this NRA. Negotiations may be necessary to allow adjustments to computing time requests given resource constraints.

Allocation of HEC resources will be awarded based on the multi-year phasing plan confirmed during the selection process. Principal Investigators (PIs) have the opportunity to submit requests for minor modifications to their plan (e.g., allocation of additional HEC resources) on a semi-annual basis. The HEC website provides the mechanism for PIs to formally request modifications to computing time allocations as identified in their funded proposals. Visit [http://www.hec.nasa.gov/request/science\\_call.html](http://www.hec.nasa.gov/request/science_call.html) for process details. Requests for modifications cannot be guaranteed, but SMD will make every attempt to satisfy the needs in the context of the overall set of requirements, resource constraints, and science priorities.

To expedite initiation of new projects where PI and/or users are foreign nationals (whose accounts will require additional documentation and longer processing), the HEC program will consider providing a minimal allocation to such projects which have been notified of pending funding soon after the PI submits an allocation request in e-Books (accessed through the HEC website). PIs should identify this foreign national status in their request abstract.

For further information about NASA provided High-End Computing resources contact:

Tsengdar J. Lee  
Earth Science Division  
Science Mission Directorate  
NASA Headquarters  
Washington, DC 20546-0001  
E-mail: [Tsengdar.J.Lee@nasa.gov](mailto:Tsengdar.J.Lee@nasa.gov)  
Telephone: 202-358-0860

(e) Opportunities for Education and Communications

SMD strives to foster broad involvement of the Earth and Space science communities in Education and Communications (E&C). Some individual program elements within ROSES (See Appendix C) may include some E&C associated with the proposed research activities, but in general they do not. Regarding Education, SMD has awarded [Science Education Cooperative Agreements](#) that will cover this work. ROSES participants are encouraged to work with the science education providers, as appropriate. Questions and/or comments and suggestions about the SMD E&C program may be directed to: Kristen Erickson at [kristen.erickson@nasa.gov](mailto:kristen.erickson@nasa.gov).

(f) Availability of Funds for Awards

Prospective proposers to this NRA are advised that funds are not in general available for awards for all of its solicited program elements at the time of its release. The Government's obligation to make awards is contingent upon the availability of sufficient appropriated funds from which payment can be made and the receipt of proposals that NASA determines are acceptable for award under this NRA.

(g) Successor, Resubmitted, Multiple and Duplicate Proposals

PIs holding awards under any program element of any prior NRA are welcome to submit "successor" proposals that seek to continue a previously funded line of research. However, as

described in the [NASA Guidebook for Proposers](#) (Section 1.5 Successor Proposals) such successor proposals will be considered with neither advantage nor disadvantage along with new proposals that are submitted for that same program.

Generally, proposers are welcome to resubmit proposals (or tasks) that were not funded under a prior solicitation. Such submissions will be peer reviewed and considered with neither advantage nor disadvantage along with new proposals that are received by NASA. However, some Appendices and program elements in ROSES may limit submissions in a couple of ways.

The first limitation on submission prevents "multiple" proposals to a given program element. Some program elements in Appendix B (Heliophysics) will not allow a particular individual to be the PI on more than one proposal to those program elements. The first proposal identifying a particular PI will be evaluated, but any subsequent proposal to the same program element that identifies the same PI will not be evaluated or considered.

The second limitation bars submission of "duplicate" proposals. Planetary Science will not accept duplicate (the same or essentially the same) proposals submitted to any of its program elements (Appendix C, or its parts of cross-division programs in Appendix E). See C.1 for more information.

In either case, the order of receipt of the proposals will be determined by the time stamp generated automatically by the proposal submission system. Please carefully read the program elements and propose to Heliophysics and Planetary Science with this in mind.

(h) Order of Precedence: The Guidebook vs. ROSES vs. Program Elements

Any inconsistency among authorities or agency instructions stated in or referenced in this solicitation shall be resolved by giving precedence in the following order:

Statutes and regulations

Program elements

The Summary of Solicitation of the ROSES NRA (i.e., this document)

Guidebook for Proposers Responding to a NASA Funding Announcement

There may be cases when the instructions in more than one of these documents are contradictory. In cases of contradictions between texts, individual Program Elements take precedence over this *Summary of Solicitation*, and this *Summary of Solicitation* takes precedence over the *Guidebook*.

An example of a case where individual Program Elements occasionally contradict and supersede the *Guidebook* is letters of endorsement. Section 2.3.9 of the *Guidebook* states that letters that endorse the value or merit of a proposal will not be considered in the evaluation of the proposal, but a few individual Program Element in ROSES do allow letters of affirmation, see Table 1.

An example of a case where this *Summary of Solicitation* contradicts and supersedes the *Guidebook* is in the location of the Table of Personnel and Work Effort. Section 2.3 of the *Guidebook* places the Table of Personnel and Work Effort after the budget and special notifications, but this *ROSES Summary of Solicitation* emphasizes this table by moving it further up, right after Biographical Sketches/Curriculum Vitae.

Moreover, this *Summary of Solicitation* may include instructions that are more specific or detailed than the *Guidebook*, and Program Elements often include instructions that are more specific or detailed than this *Summary of Solicitation* or the *Guidebook*.

An example of a case where individual Program Element differs with this *Summary of Solicitation* is in how Relevance is evaluated. Section VI (a) lays out a general approach to evaluating relevance, but a few individual program elements in Appendix C require explicit statements of relevance through mandatory text boxes on the NSPIRES cover pages.

Finally, answers to questions may appear in FAQs. The FAQ for the ROSES NRA appears at <http://science.nasa.gov/researchers/sara/faqs/>. Any FAQs for individual program elements will appear under "other documents" on the NSPIRES web page for the program element. FAQs merely present clarification, they do not contradict instructions in the *Guidebook*, ROSES or Program Elements.

Questions about a difference between ROSES and *the Guidebook* should be directed to [sara@nasa.gov](mailto:sara@nasa.gov) and questions about a difference between either of those and an individual Program Elements, should be directed to the point of contact for the particular program element and cc [sara@nasa.gov](mailto:sara@nasa.gov).

(i) Access to NASA Facilities/Systems

For any awards where individuals need access to NASA facilities and/or systems, all award recipients must work with NASA program staff to ensure proper credentialing. Such individuals include U.S. citizens, lawful permanent residents ("green card" holders), and foreign nationals (those who are neither U.S. citizens nor permanent residents).

## II. AWARD INFORMATION

(a) Funding and Award Policies

NASA may support an award as outlined in the proposal budget, or may offer to fund only selected tasks, or all tasks for a shorter duration (e.g., a one year pilot study), or a combination. Awards may depend on acceptable revised versions of budgets, statements of work, data management plans, or other elements of proposals described in ROSES or in the [NASA Guidebook for Proposers](#).

The amount of funds expected to be available for new awards for proposals submitted in response to this NRA is given in the Summary Table of Key Information at the end of each program element in the appendices. An estimate of the number of awards that might be made for each program element is also given in this Table, contingent on budget allocation to that program element and availability of funding and presuming the submission of sufficient highly rated proposals.

In all cases, NASA's goal is to initiate new awards as rapidly as possible after the selection of proposals is announced for each program element. However, the workload experienced by NASA, the availability of appropriated funds, and any necessary postselection negotiations with the proposing organization(s) needed for the award(s) in question can all cause delays. Regarding this last item, every proposer is especially encouraged to submit full and detailed explanations of the requested budget (see Section 2.3.10 of the [NASA Guidebook for Proposers](#)) to help expedite the processing of the award, should their proposal be selected.

Subject to limitations in particular program elements, ROSES allows the full range of award types: grants, cooperative agreements, contracts, and intra- or interagency transfers. The budget narrative need not state the type of award instrument that is anticipated. A NASA awards officer will determine the appropriate award instrument for the selections resulting from this solicitation,

see Section 3 "Choice of Award Instrument" from the *Grants and Cooperative Agreement Manual (GCAM)*<sup>1</sup> and Appendix D of the [NASA Guidebook for Proposers](#). In the case of any conflict, the *GCAM* takes precedence. Contract awards will be subject to the provisions of the Federal Acquisition Regulations (FAR) and the NASA FAR Supplement (see [http://prod.nais.nasa.gov/cgi-bin/nais/nasa\\_ref.cgi](http://prod.nais.nasa.gov/cgi-bin/nais/nasa_ref.cgi)).

Several program elements exclude contracts because it does not seem appropriate for the nature of the work solicited. If contracts are excluded, the program element will indicate that explicitly. At the time of this writing, some of the program elements that exclude contracts include most of Appendix C and A.15, A.26, A.39, B.2, and B.4. If a prospective proposer to a program element that excludes contracts thinks that their work should be a contract, they should communicate with the point of contact for that program element.

(b) Award Period of Performance

The maximum period of performance (duration) for new awards for proposals submitted in response to this NRA is given in the Summary of Key Information that concludes each program element description in the appendices. The usual maximum period of performance ranges from one year for activities of limited scope to five years for extensive, comprehensive studies. Award durations may be longer in special cases, such as teams of long duration space missions. Whatever the proposed period of performance it must be justified in the proposal. The appropriateness of the proposed period of performance will be evaluated by peer review. NASA may offer to support an award of shorter duration than was proposed.

(c) Increasing Access to the Results of Federally Funded Research

In keeping with the [NASA Plan for Increasing Access to Results of Federally Funded Research](#), new terms and conditions about making manuscripts and data publically accessible may be attached to awards that derive from ROSES. Most proposals to ROSES will be required to provide a data management plan (DMP) or an explanation of why one is not necessary given the nature of the work proposed. In most cases the data management plan will be collected on the NSPIRES web cover pages and limited to 8000 characters. Any program element that doesn't require a DMP via the cover pages will say so explicitly. Even where DMPs are not required with the proposal, if those awards do result in peer reviewed publications, grantees must still meet the mandatory minimum requirement that the data behind figures and tables be available electronically at the time of publication, ideally in supplementary material with the article. The kind of proposal that requires a data management plan is described in the [SARA FAQs on this subject](#). The appendices and individual program elements of ROSES may specify preferred archives and may require more than is outlined here for all proposers or just those that generate certain kinds of data. Please read the individual program elements carefully, especially Appendix C, which has its own instructions and FAQs. Proposers that include a plan to archive data should allocate suitable time for this task. Unless otherwise stated, this requirement obviates the need for the data sharing plan mentioned in the [NASA Guidebook for Proposers](#). For information about data rights, and other aspects of intellectual property such as invention rights resulting from awards see the file entitled "Award and Intellectual Property Information" under the section

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<sup>1</sup> The *NASA Grants and Cooperative Agreement Manual*, hereafter referred to as the GCAM, is at [https://prod.nais.nasa.gov/pub/pub\\_library/Grant\\_and\\_CooperativeAgreementManual.doc](https://prod.nais.nasa.gov/pub/pub_library/Grant_and_CooperativeAgreementManual.doc)

called "Grant and Cooperative Agreement Guidance" at [https://prod.nais.nasa.gov/pub/pub\\_library/srba/](https://prod.nais.nasa.gov/pub/pub_library/srba/).

#### (d) Rephrasing of Award Budgets

Occasionally the schedule for a research project changes, and this will change the phasing of the funding requirement. "Rephrasing" funding may be initiated either at the request of the PI or NASA.

In keeping with NASA's practice, SMD will accommodate all reasonable requests from the PI or Authorized Organization Representative (AOR) to rephrase ROSES awards to accommodate a PI's need to care for family and health (e.g., for family or medical leave), as long as it does not compromise previously agreed upon project goals, timelines, or deliverables associated with a NASA requirement described in the contract (grants are not used for NASA requirements). This is consistent with NASA's policy that allows grantee initiated first time no-cost extensions of up to 12 months. See <https://www.nssc.nasa.gov/nocostextension> for more information.

To facilitate the reduction of funds from one fiscal year remaining unspent in the next fiscal year (uncosted carryover), SMD program officers engage in active grant management after appropriate communication with the grantees. Program Officers assess the uncosted carryover in the awards in their portfolios. While some uncosted carryover is necessary, those awards that are both (a) carrying a year (or more) of funding and (b) carrying a total carryover of \$100K or more will be considered for rephrasing. Program Officers take into account the history of funding and costing on a grant-by-grant basis.

In those cases where funds for a year or more are being carried over, Program Officers will inform the PI of their intentions regarding fund disbursement/rephrasing and give the PI an opportunity to respond. The total funds disbursed would not change, only the fiscal year (FY) in which they arrive.

SMD policy is that work on continuing awards should not be deferred because of a delay in receipt of funds. If an award is rephased, NASA will make every reasonable effort to provide the next fiscal year funding in a timely manner. Honoring commitments and ensuring the continuation of existing projects is a high priority of SMD.

### III. ELIGIBILITY INFORMATION

#### (a) Eligibility of Applicants

Prospective investigators from any category of organizations or institutions, U.S or non-U.S., are welcome to respond to this solicitation. Specific categories of organizations and institutions that are welcome to respond include, but are not limited to, educational, industrial, and not-for-profit organizations, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), NASA Centers, the Jet Propulsion Laboratory (JPL), and other Government agencies. Historically Black Colleges and Universities (HBCUs), Other Minority Universities (OMUs), small disadvantaged businesses (SDBs), veteran-owned small businesses, service disabled veteran-owned small businesses, HUBZone small businesses, and women-owned small businesses (WOSBs) are encouraged to apply.

"Citizen science" activities, in which the public contributes to the scientific process, can advance science investigations through activities that include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new

discoveries, developing technologies and applications, and solving complex problems. Proposers to any ROSES program element are invited to incorporate citizen science and crowdsourcing methodologies into their submissions, where such methodologies will advance the objectives of the proposed investigation. Proposers considering the use of these methodologies should be aware of the Federal Citizen Science and [Crowdsourcing Toolkit](#), which gives prospective citizen science project developers tips for designing, carrying out, and sustaining their projects. Such activities are, like the rest of the proposal, subject to the announced evaluation factors, including relevance and merit.

Participation by non-U.S. organizations in this program is welcome, but subject to NASA's policy of no exchange of funds, in which each government supports its own national participants and associated costs (further information on foreign participation is provided in Section 1.6 of the [NASA Guidebook for Proposers](#)). NASA does not normally fund foreign research proposals or foreign research efforts that are part of U.S. research proposals. Rather, cooperative research efforts are implemented via international agreements between NASA and the sponsoring foreign agency or funding/sponsoring institution under which the parties agree to each bear the cost of discharging their respective responsibilities. NASA funding may not be used for subcontracted foreign research efforts, including travel. The direct purchase of supplies and/or services, which do not constitute research, from non-U.S. sources by U.S. award recipients is permitted.

#### (b) Number of Proposals and Teaming Arrangements

There is no restriction on the number of proposals that an organization may submit to this solicitation, or on the teaming arrangements for any one proposal, including teaming with employees of NASA's Centers and the Jet Propulsion Laboratory. However, some Appendixes limit the number of proposals that may be submitted by an individual PI to a program element or bar duplicate proposals, see Section I(g). Moreover, each proposal must be a separate, stand-alone, complete document for evaluation purposes.

#### (c) Restrictions Involving China

Proposals must not include bilateral participation, collaboration, or coordination with China or any Chinese-owned company or entity, whether funded or performed under a no exchange of funds arrangement.

In accordance with restrictions in Appropriation Acts, NASA is prohibited from funding any work that involves the bilateral participation, collaboration, or coordination with China or any Chinese-owned company or entity, whether funded or performed under a no exchange of funds arrangement.

Proposals involving bilateral participation, collaboration, or coordination in any way with China or any Chinese-owned company, whether funded or performed under a no-exchange-of-funds arrangement, may be ineligible for award.

For more information please see the ROSES FAQ on the SARA web page at <http://science.nasa.gov/researchers/sara/faqs/prc-faq-roses/>

As stated in 2 CFR 1800 Appendix A, NASA requires Certifications, Assurances, and Representations, including Certifications and Assurances to implement restrictions in Appropriation Acts, that are applicable to all awards. By submission of a proposal, proposers are certifying that the proposing organization has read and is in compliance with all the Certifications, Assurances, and Representations, including that they are not China or a Chinese-

owned company, and that they will not participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level or at any subrecipient level, whether the bilateral involvement is funded or performed under a no exchange of funds arrangement.

An Assurance of Compliance with restrictions in Appropriation Acts herein after referred to as "the Acts" whereas:

(1) NASA is restricted from using funds appropriated in the Acts to enter into or fund any grant or cooperative agreement of any kind to participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level and at all subrecipient levels, whether the bilateral involvement is funded or performed under a no exchange of funds arrangement.

(2) Definition: "China or Chinese-owned Company" means the People's Republic of China, any company owned by the People's Republic of China, or any company incorporated under the laws of the People's Republic of China.

(3) The restrictions in the Acts do not apply to commercial items of supply needed to perform a grant or cooperative agreement.

(4) By submission of its proposal, the proposer represents that the proposer is not China or a Chinese-owned company, and that the proposer will not participate, collaborate, or coordinate bilaterally with China or any Chinese-owned company, at the prime recipient level or at any subrecipient level, whether the bilateral involvement is funded or performed under a no exchange of funds arrangement.

#### (d) Cost Sharing or Matching

If an institution of higher education or other not-for-profit organization wants to receive a grant or cooperative agreement, cost sharing is not required, although NASA can accept cost sharing if it is voluntarily offered (see 2 CFR 200.306, 2 CFR 1800.306, *GCAM 5.6 Funding*). If a commercial organization wants to receive a grant or cooperative agreement, cost sharing is required unless the commercial organization can demonstrate that it does not expect to receive substantial compensating benefits for performance of the work. If this demonstration is made, cost sharing is not required, but may be offered voluntarily (see references in parenthesis above and [14 CFR](#) §1274.204, "Costs and Payments"). See also Section VI(a) "Evaluation Criteria" below.

Each proposal must include a Summary of Proposal Personnel and Work Effort with names and planned work of all personnel necessary to perform the proposed effort, regardless of whether that work effort requires funding or not. The *NASA Guidebook for Proposers* notes that any work planned that is not funded by NASA listed in the Summary of Proposal Personnel and Work Effort is not considered cost sharing as defined in 2 CFR § 200.29. This allows all proposers to accurately reflect the actual time they will devote, whether or not it is paid for by NASA. Level of effort estimates for unfunded team members are not intended to represent voluntary committed cost sharing. Collaborators should be listed on the table, but their level of effort may be simply given as "de minimis."

#### IV. PROPOSAL AND SUBMISSION INFORMATION

##### (a) Proposal Instructions and Requirements

All information needed to apply to this solicitation is contained in this ROSES NRA and in the companion document, the *NASA Guidebook for Proposers*, located at <http://www.hq.nasa.gov/office/procurement/nraguidebook>. By reference, the latest edition of the *NASA Guidebook for Proposers* is incorporated into this NRA. We also include 48 CFR 1852.235-72 by reference and it appears in Appendix B of the *NASA Guidebook for Proposers*. Proposers are responsible for understanding and complying with its procedures for the successful, timely preparation and submission of their proposals. Proposals that do not conform to its standards may be declared noncompliant and rejected without review.

Questions regarding this NRA or its program elements should be directed to the cognizant Program Officer identified in the Summary Table of Key Information at the end of each program element or on the [list of program officers](#) on the SARA web page. Any clarifications or questions and answers that are published will be posted on the relevant program element's index page in NSPIRES.

The introductory material, as well as the appendices, of the *NASA Guidebook for Proposers* provides additional information about the entire NRA process, including NASA policies for the solicitation of proposals, guidelines for writing complete and effective proposals, and NASA's general policies and procedures for the review and selection of proposals and for issuing and managing the awards to the institutions that submitted selected proposals. A group of Frequently Asked Questions (FAQs) provides additional miscellaneous information about a variety of the NASA proposal and award processes, policies, and procedures.

Comments and suggestions of any nature about the *NASA Guidebook for Proposers* are encouraged and welcome and may be directed at any time to the point of contact identified in Section VIII below.

##### (b) Content and Form of the Proposal Submission

###### (i) Electronic Proposal Submission

All proposals submitted in response to this ROSES NRA must be submitted in a fully electronic form. No hard copy of the proposal is required or permitted. Electronic proposals must be submitted by one of the officials at the PI's organization who is authorized to make such a submission; electronic submission by the authorized organization representative (AOR) serves for the proposal as the required original signature by an authorized official of the proposing organization.

Proposers may opt to submit proposals in response to this ROSES NRA via either of two different electronic proposal submission systems: either via the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) (<http://nspires.nasaprs.com>; see Section IV(b)(iv) below) or via Grants.gov (<http://www.grants.gov>; see Section IV(b)(v) below).

Note carefully the following requirements for submission of an electronic proposal, regardless of the intent to submit via NSPIRES or Grants.gov.

- Every organization that intends to submit a proposal to NASA in response to this NRA, including educational institutions, industry, not-for-profit institutions, the Jet Propulsion Laboratory, NASA Centers, and other U.S. Government agencies, must be registered in

NSPIRES. This applies equally for proposals submitted via Grants.gov, as well as for proposals submitted via NSPIRES. Every organization that intends to submit a proposal through Grants.gov must also be registered in Grants.gov, as well as in NSPIRES. Registration for either proposal data system must be performed by an organization's electronic business point-of-contact (EBPOC) in the System for Award Management (<http://www.sam.gov>).

- Any organization requesting NASA funds through the proposed investigation must be listed on the Proposal Cover Page. NASA will not fund organizations that do not appear on the Proposal Cover Page.
- Each individual team member (e.g., PI, Co-Investigators, etc.), including all personnel named on the proposal's electronic cover page, must be individually registered in NSPIRES. This applies equally for proposals submitted via Grants.gov, as well as for proposals submitted via NSPIRES.
- Unless specifically allowed by an individual program element appendix, multiple PIs (as described in Section 1.4.2 of the *NASA Guidebook for Proposers*) are not permitted. The use of other categories of participation described in Section 1.4.2 of the *NASA Guidebook for Proposers*, including Science PI, Institutional PI, and Co-PI (from a non-U.S. organization under specific circumstances), remain permitted.
- Each individual team member (e.g., PI, co-investigators, etc.), including all personnel named on the proposal's electronic cover page, must confirm their participation on that proposal (indicating team member role) and specify an organizational affiliation. For proposals submitted via NSPIRES, this confirmation is via NSPIRES (see Section IV(b)(iv), below). For proposals submitted via Grants.gov, this confirmation is via "Letters of Commitment" included within the proposal. The organizational affiliation specified on the cover page must be the organization through which the team member would work and receive funding while participating in the proposed investigation. If the individual has multiple affiliations, then this organization may be different from the individual's primary employer or preferred mailing address. Team members are asked to ensure that their contact information in NSPIRES is up to date. Changes can be made using the "Account Management" link on the "NSPIRES Options" page.

Generically, an electronic proposal consists of electronic forms and one or more attachments. The electronic forms contain data that will appear on a proposal's cover pages and will be stored with the proposal in the NSPIRES database. A proposal submitted in response to this NRA must have only a single attachment (unless there is an accompanying HEC request; see Section I (d) above). The single attachment contains all sections of the proposal, including the Science/Technical/Management section, the budget narrative, and all required and allowed appendices; see Section IV(b)(ii) below for further requirements.

Submission of proposals via either NSPIRES or Grants.gov is a two-part process. When the PI has completed entry of the data requested in the required electronic forms and attachment of the allowed PDF attachments, including the Science/Technical/Management section, an official at the PI's organization who is authorized to make such a submission, referred to as the Authorized Organizational Representative (AOR), must submit the electronic proposal (forms plus attachments). Coordination between the PI and his/her AOR on the final editing and submission

of the proposal materials is facilitated through their respective accounts in NSPIRES and/or Grants.gov.

(ii) Proposal Format and Contents

All proposals submitted in response to this NRA must include any specified required electronic forms available through either of two proposal submission systems, NSPIRES or Grants.gov. Submission via NSPIRES requires responding to questions on the NSPIRES submission page.

The Science/Technical/Management section and other required sections of the proposal must be submitted as a single, searchable, unlocked PDF file that is attached to the electronic submission using one of the proposal submission systems. Proposers must comply with all format requirements specified in this NRA (see Table 1 for a summary) and in the *NASA Guidebook for Proposers* (e.g., Section 2.3). Only appendices that are specifically requested in the *NASA Guidebook for Proposers* and allowed by this NRA or a program element will be permitted; proposals containing unsolicited appendices may be declared noncompliant. Section 2 of the *NASA Guidebook for Proposers* provides detailed discussions of the content and organization of proposals suitable for all program elements in this NRA, as well as the default page limits of a proposal's constituent parts.

Note that some of the program element descriptions in Appendices A through E of this NRA may specify different page limits for the main body of the proposal; if so, these page limits will be prominently given in the Summary of Key Information subsection that concludes each program element description. In the event the information in this NRA is different from or contradictory to the information in the *NASA Guidebook for Proposers*, the information in this NRA takes precedence.

Proposals submitted in response to ROSES must follow the *Guidebook* rules for formatting: body text and captions maybe up to 15 characters per inch, typical of font Times New Roman 12, though text within figures and tables may be smaller if still judged by the reviewers to be readable. See Table 1 for details.

Important note on creating PDF files for upload: It is essential that all PDF files generated and submitted meet NASA requirements. This will ensure that the submitted files can be ingested by NSPIRES regardless of whether the proposal is submitted via NSPIRES or Grants.gov. At a minimum, it is the responsibility of the proposer to: (1) ensure that all PDF files are unlocked and that edit permission is enabled – this is necessary to allow NSPIRES to concatenate submitted files into a single PDF document; and (2) ensure that all fonts are embedded in the PDF file and that only Type 1 or TrueType fonts are used. In addition, any proposer who creates files using TeX or LaTeX is required to first create a DVI file and then convert the DVI file to Postscript and then to PDF. See [http://nspires.nasaprs.com/tutorials/PDF\\_Guidelines.pdf](http://nspires.nasaprs.com/tutorials/PDF_Guidelines.pdf) for more information on creating PDF documents that are compliant with NSPIRES. PDF files that do not meet NASA requirements cannot be ingested by the NSPIRES system; such files may be declared noncompliant and not submitted to peer review for evaluation.

There is a 20 MB size limit for proposals (Section 2.3(c) of the *NASA Guidebook for Proposers*). Large file sizes can impact the time it takes for NASA and peer reviewers to download and access the proposal. In order to increase the ease in reviewing the proposal, the proposer should crop and compress any embedded photos and graphic files to an appropriate size and resolution.

(iii) New Budget Rules: Redaction of All Salaries and Indirect Costs

What is included in the budgets has changed this year, so please read this section carefully. Often, peer reviewers evaluate cost reasonableness of ROSES proposals, see Section VI (a), but they do not need salaries or overhead rates to do so. In an attempt to balance NASA's need to have all budget details, while having peer reviewers evaluate only work effort, all proposers, even NASA civil servants, must list all costs, including salaries and indirect rates, in the web cover page budgets. Subawards that include salary and overhead belong in Section F (Other Direct Costs) rows 5, 8, and 9. These rows will be automatically hidden from peer reviewers.

The budget justification in the proposal document must rationalize all costs other than salaries and overhead, which may not be mentioned. Proposals submitted in response to this ROSES NRA must include the Summary of Work effort (see Table 1) which, along with any rationale of the time provided in the budget justification, will allow peer reviewers to evaluate whether the level of effort is appropriate.

~~As in prior years, a detailed budget is recommended, the only difference this year is that no salary or indirect rate information should be included in the detailed budget in the main body of the proposal. Since NASA funding sent to NASA Centers must be obligated in the same fiscal year (FY) in which they are received, proposals submitted by NASA Centers (but not including JPL) should begin the budget section of the proposal with a breakdown of funding by NASA Center and by fiscal year, assuming the start date given in the Summary of Key Information table at the end of the program element (the default is six months after proposal submission). Thus, a ROSES 2016 proposal for a two-year award that starts in mid FY 2017 could phase the funds for a half year of funding in FY 2017, a full year in FY 2018, and a half a year in FY 2019.~~

**No salary or indirect rate information may be included in the detailed budget, or anywhere else in the proposal document. All ROSES program elements are set up to allow proposers to separately upload a "Total Budget" PDF to the same ROSES program element NSPIRES "response structure" to which the proposal is submitted. This Total Budget PDF will not be seen by peer reviewers. Unless otherwise specified in the ROSES program element, all proposers are required to include the complete detailed budget in this separate Total Budget PDF. Where more than one organization is involved, the total that was simply given as a single number in row 5, 8, or 9 of Section F should be broken out in the separately uploaded Total Budget PDF. That is, the Total Budget PDF must lay out clearly how much is going to each organization, indicating whether the funds are passing through the proposing organization and which are not. See [Section IV. \(d\)](#). Where the funds are passing through the proposing organization, the Total Budget PDF must specify any overhead. Since ROSES funding for NASA Civil Servant salaries must be obligated in the same fiscal year (FY), proposals that include NASA Civil Servant salaries may need to phase the funds for NASA Centers by fiscal year. Proposers from non-Governmental organizations with NASA Civil Servant Co-Investigators need to get this information from their NASA Civil Servant Co-Investigators. For examples see the SARA Frequently Asked Questions at <http://science.nasa.gov/researchers/sara/how-to-guide/nspires-CSlabor/> [Added March 24, 2016].**

Proposers from JPL should not include the JPL award fee in the total requested amount, nor should the budgets of JPL Co-Investigators on proposals from other institutions include the JPL award fee in their total requested amount. The total requested amount is that which appears on

the NSPIRES online (cover page) budget form or the Grants.gov standard budget form. JPL award fees are paid for and accounted for by a different mechanism than the mechanism used to fund research investigations.

(iv) Submission of Proposals via NSPIRES, the NASA Proposal Data System

Proposals may be submitted electronically via NASA's master proposal data base system, the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES). The only exceptions are occasional joint calls with the National Science Foundation (NSF) that use FastLane and the Swift and Fermi Guest Investigator and NuSTAR Guest Observer programs in Astrophysics (Program Elements D.5 Swift Guest Investigator – Cycle 13, D.6 Fermi Guest Investigator – Cycle 10, and D.10 NuSTAR Guest Observer – Cycle 3), see those program elements for details. In order to submit a proposal via NSPIRES, this NRA requires that the proposer register key data concerning the intended submission with NSPIRES at <http://nspires.nasaprs.com>. Potential applicants are urged to access this site well in advance of the Notice of Intent (NOI) and proposal due dates of interest to familiarize themselves with its structure and enter the requested identifier information.

It is especially important to note that every individual named on the proposal's electronic Cover Page form (see below) as a proposing team member in any role, including co-investigators and collaborators, must be individually registered in NSPIRES and that such individuals must perform this registration themselves; no one may register a second party, even the PI of a proposal in which that person is committed to participate. It is also important to note that every named individual must be identified with the organization through which they are participating in the proposal, regardless of their place of permanent employment or preferred mailing address. This data site is secure and all information entered is strictly for NASA's use only.

Every individual identified on the NSPIRES proposal cover page as a team member must indicate their commitment to the proposed investigation through NSPIRES prior to proposal cover page submission. Team members must additionally confirm the organization through which they are participating on this proposal. A team member will receive an E-mail from NSPIRES indicating that he/she has been added to the proposal and should log in to NSPIRES.

- Once logged in, the team member should follow the link in the "Reminders and Notifications" section of his NSPIRES homepage, titled "Need <role> confirmation for proposal <title> for Solicitation <<solicitation number>>." On the "Team Member Participation Confirmation" page, the proposal team member should read language about the Organizational Relationship, then click the "Continue" button.
- If the contact information then displayed on the "Team Member Profile" screen is out of date, the proposal team member should update this information later using the "Account Mgmt" link in the NSPIRES navigation bar across the top. Prior to making that update, however, the team member should follow the on-screen prompts to identify the organization through which he/she is participating on this proposal. Click the "Link Relationship" button to the right side of the "Organizational Relationship" banner. Select the organization from the "Link Proposal to an Association" part of the page. If the correct organization is not displayed here, try using the "Add Association" button to add the organization to this list. Then click the "Save" button at the bottom of the page. If the team member cannot find the organization when searching in the "Add Association" area (i.e., the organization is not registered), type in the formal name in the space provided (or select "Self," if appropriate). Once the

organization is selected and the "Save" button is clicked, there is a confirmation page that allows the team member to edit that relationship if it was chosen incorrectly. Click "Continue".

- Note that the organization through which the proposal team member is participating in the proposal might not be the proposal team member's primary employer or primary mailing address. If the address information is accurate (or once it has been edited to be accurate), the proposal team member may log out of NSPIRES.
- NSPIRES will send an E-mail to both the team member and the PI confirming that the commitment was made and the organization was identified. The PI may additionally monitor the status of proposal team member commitments by examining the "Relationship Confirmed" column on the Team Member page of the NSPIRES proposal cover page record. Note that the proposal cannot be submitted until all identified team members have confirmed their participating organizations.

All proposals submitted via NSPIRES in response to this NRA must include a required electronic Cover Page form that is accessed at <http://nspires.nasaprs.com/>. This form is comprised of several distinct sections: a Cover Page that contains the identifier information for the proposing institution and personnel; a Proposal Summary that provides an overview of the proposed investigation that is suitable for release through a publicly accessible archive should the proposal be selected; Business Data that provides the proposed start and end dates, as well as other proposal characteristics; a Budget form that contains a budget summary of the proposed research effort; Program Specific Data that includes required questions specific to ROSES and that particular program element; and Proposal Team that provides the co-investigators and other participants in the proposal. This Cover Page form is available for access and submission well in advance of the proposal due dates given in Tables 2 and 3 of this NRA and remains open until the proposal due date for each program element. Unless specified in the program element description itself, no other forms are required for proposal submission via NSPIRES. See the *NASA Guidebook for Proposers*, Sections 2 and 3, for further details.

Although NSPIRES has the ability to accept many, separate proposal documents, the required elements of any proposal submitted in response to this NRA must be submitted as a single, searchable, unlocked PDF document that contains the complete proposal, including the Science/Technical/Management section and budget justification, assembled in the order provided in the *NASA Guidebook for Proposers* (see Section 2.3) and uploaded as a single attachment using the tools in NSPIRES. The proposer is responsible for assembling the complete proposal document for peer review. All required and permitted appendices must be included in the PDF file and should not be uploaded as separate attachments, unless specified otherwise in the program element description in the appendices to this NRA or in Section I (d), if an HEC request is being made. Including any part of the proposal twice creates an additional burden on the peer reviewers. Documents such as team member biographical sketches, letters of commitment, and current and pending support should not be uploaded to NSPIRES as separate files.

NSPIRES generates error and warning messages as part of the element check concerning possibly missing data. An error (designated by a red X) will preclude proposal submission to NASA by the AOR. A warning (indicated by a ! on a yellow field) is an indication that data may be missing; a warning can be ignored after verifying that the material is included in the single attachment containing the complete proposal. Any actions taken because of warnings are at the PI's discretion.

In addition, it is unnecessary to download the Proposal Cover Page and incorporate it into the Proposal Document. NSPIRES will automatically route the two parts of the proposal (Cover Page form, proposal document) to the reviewers.

Proposers are encouraged to begin their submission process early. Tutorials and other NSPIRES help topics may be accessed through the NSPIRES online help site at <http://nspires.nasaprs.com/external/help.do>. For any questions that cannot be resolved with the available online help menus, requests for assistance may be directed by E-mail to [nspires-help@nasaprs.com](mailto:nspires-help@nasaprs.com) or by telephone to (202) 479-9376, Monday through Friday, 8:00 a.m. – 6:00 p.m. Eastern Time.

(v) Submission of Proposals via Grants.gov

Grants.gov may be used in place of NSPIRES to submit proposals in response to this ROSES NRA. Grants.gov requires that the PI download an application package and an instruction package from Grants.gov. Identifying the appropriate application package requires the funding opportunity number for that program element; the funding opportunity number may be found in the Summary of Key Information subsection that concludes each program element description in the appendices of this NRA. Proposals submitted via Grants.gov must be submitted by the AOR.

Submitting a proposal via Grants.gov requires the following steps:

- Grant researchers (PIs) do not need to register with Grants.gov. However, every individual named in the proposal as a proposing team member in any role, including PI, Co-Investigators, and collaborators, must be registered in NSPIRES (<http://nspires.nasaprs.com>) and such individuals must perform this registration themselves; no one may register a second party, even the PI of a proposal in which that person is committed to participate. This data site is secure and all information entered is strictly for NASA's use only.
- Follow Grants.gov instructions provided at the website to download any software tools or applications required to submit via Grants.gov.
- Download the application package from Grants.gov by selecting "Select package" under "Package" for the specific Funding Opportunity at <http://www.grants.gov>. Each program element described in an appendix of ROSES requires a different application package and has a different Funding Opportunity Number; the Funding Opportunity Number may be found in the Summary of Key Information at the end of the program element description in each appendix of ROSES. Enter the appropriate Funding Opportunity Number to retrieve the desired application package. All ROSES application packages may be found by searching on CFDA Number 43.001.
- Note that Grants.gov proposers must additionally download the "Instructions" document, in addition to the "Package" as this includes the Program Specific Data form that contains the mandatory data management plan as well as important questions about, for example, China and ITAR.
- Complete the required Grants.gov forms, including the Standard Form 424 Application for Federal Assistance, research and research-related (R&R) Other Project Information, R&R Senior/Key Person Profile, and R&R Budget. Every named individual must be identified

with the organization through which they are participating in the proposal, regardless of their place of permanent employment or preferred mailing address.

- Complete the required NASA specific forms including NASA Other Project Information, NASA PI and Authorized Representative Supplemental Data Sheet, and NASA Senior/Key Person Supplemental Data Sheet (this form is only required if there are Senior/Key Persons other than the PI).
- Complete any NASA program-specific form that is required for the specific program element. This form, which is usually required for all ROSES program element submissions, is included as a PDF form within the proposal instruction package downloaded from Grants.gov. The form, once completed, is attached to the NASA Other Project Information form.
- Create a proposal in PDF, including the Science/Technical/Management section and all other required proposal sections (see Section 2 of the *NASA Guidebook for Proposers*). Attach sections as separate PDF documents as prompted by Grants.gov. Do not duplicate materials; if a document must be provided as a separate attachment, do not also include it as part of the proposal narrative PDF file.
- Because Grants.gov does not support the electronic commitment of team members, statements of commitment from all team members must be provided as letters attached to the proposal application at the place(s) specified by Grants.gov. This statement must include confirmation of both the team member role in the proposed effort (e.g., Co-Investigator, collaborator) and the identification of the organization through which the team member will be participating.

Here is an example of a statement of commitment: "I acknowledge that I am identified by name as <<role>> to the investigation, entitled <<name of proposal>>, that is submitted by <<name of Principal Investigator>> to the NASA Research Announcement <<alpha-numeric identifier>>, and that I intend to carry out all responsibilities identified for me in this proposal. I understand that the extent and justification of my participation as stated in this proposal will be considered during peer review in determining in part the merits of this proposal. I have read the entire proposal, including the management plan and budget, and I agree that the proposal correctly describes my commitment to the proposed investigation. For the purposes of conducting work for this investigation, my participating organization is <<insert name of organization>>."

- Submit the proposal via the Authorized Organization Representative (AOR); the PI may not submit the application to Grants.gov unless he/she is an AOR.

Potential applicants are urged to access Grants.gov site well in advance of the proposal due date(s) of interest to familiarize themselves with its structure and download the appropriate application packages and tools.

Additional instructions for formatting and submitting proposals via Grants.gov may be found in Sections 2 and 3 of the *NASA Guidebook for Proposers*. Instructions for the use of Grants.gov may be found in the Grants.gov Applicant User Guide at <http://www.grants.gov/web/grants/applicants/applicant-resources.html>. Instructions for NASA-specific forms and NASA program-specific forms may be found in the application. For any questions that cannot be resolved with the available online help menus and documentation,

requests for assistance may be directed by E-mail to [support@grants.gov](mailto:support@grants.gov) or by telephone to (800) 518-4726 twenty-four hours a day, seven days a week, except Federal holidays when the support center is closed.

(vi) Notice of Intent to Propose

For most of the program elements in Earth Science (Appendix A) and Astrophysics (Appendix D), a brief Notice of Intent (NOI) to propose is encouraged, but not required, for the submission of proposals to this solicitation. The information contained in an NOI is used to help expedite the proposal review activities and, therefore, is of considerable value to both NASA and the proposer. To be of maximum value, NOIs should be submitted by the PI via NSPIRES (located at <http://nspires.nasaprs.com>) by the dates given in Tables 2 or 3 of this NRA. Note that NOIs may be submitted within NSPIRES directly by the PI; no action by an organization's AOR is required to submit an NOI.

Grants.gov does not provide NOI capability; therefore, when possible NOIs should be submitted via NSPIRES, whether or not the proposal will be submitted via NSPIRES or Grants.gov. Interested proposers must register with NSPIRES before it can be accessed for use. NSPIRES is open for the submission of NOIs for typically 30 days, starting about 90 days in advance of the due date for the proposals themselves. Since NOIs submitted after these deadlines may still be useful to NASA, late NOIs may be submitted by E-mail to the main point of contact given in the Summary Table of Key Information at the end of the individual program element.

(vii) The Two-Step Proposal Process

Some ROSES program elements require that proposals be submitted using a two-step process in which the NOI is replaced by a required Step-1 proposal. This Step-1 proposal is an abbreviated presentation of the intended research and, as a proposal, it must be submitted by the Step-1 due date given in Tables 2 and 3 of this NRA by the organization Authorized Organizational Representative (AOR). The Step-1 proposal is a prerequisite for submission of a full Step-2 proposal, but it does not obligate the offerors to submit a Step-2 (full) proposal later.

For some program elements, the purpose of the Step-1 proposal is simply to avoid conflicts in the assembly of the review panel and no response will be provided to proposers. For other program elements, the Step-1 proposal may be evaluated to determine if the anticipated research project exhibits sufficient programmatic relevance and responsiveness to the program element to permit or encourage submission of a full Step-2 proposal. The two-step process can be structured in two ways: 1) Nonbinding two-step process in which a Step-2 proposal may be submitted even if the preceding Step-1 was discouraged or 2) A binding two-step process in which a Step-2 proposal cannot be submitted if it was not invited after the evaluation of the preceding Step-1. In any case those who submitted Step-1 proposals will be informed no later than four weeks prior to the Step-2 due date whether they are, or are not, encouraged or invited to submit a full Step-2 proposal.

The required Step-1 proposal is sometimes just the contents of the 4000 character limited Proposal Summary field in the cover pages but sometimes also requires a PDF document upload. The required contents for the Step-1 proposal will be specified in the program element description. In some cases, the investigation team is not considered binding for Step-1 (i.e., it can be adjusted between the Step-1 and Step-2 proposal), but in other cases, the Step-1 team is binding.

Some program elements limit the number of Step-2 proposals on which an individual may be PI. Please read the program element carefully. Budget data will not be requested as part of the Step-1 proposal. Unlike a Notice of Intent, which may be submitted by an individual, the Step-1 proposal must be submitted by an Authorized Organizational Representative of the proposing organization. Step-2 proposals are to be submitted in full compliance with the *NASA Guidebook for Proposers* discussed in Section IV(a) above. Proposers are encouraged to read the instructions document on Submitting Step-1 proposals that appears under "Other Documents" on the NSPIRES web page of any program element that requires a Step-1 proposal.

At the time of release of this ROSES-2016 NRA, the program elements that solicit proposals using a two-step process include: A.2 Land-Cover/Land-Use Change, A.37 Water Resources, all of the Heliophysics program elements (Appendix B), most program elements in Planetary Science (Appendix C), the K2 Guest Observer call in Appendix D, and E.3, the Cross-Division Exoplanets Research Program and E.4 the Cross-Division Habitable Worlds Program. This year Program Element B.2 Heliophysics Supporting Research will employ a "binding" two-step proposal submission process; only those proposals that are "invited" can be submitted as Step-2 proposals.

#### (viii) The Two-Phase Proposal Process

On occasion, NASA will solicit proposals using a two-phase proposal process for which Phase-1 is a request for an observation to be performed by a NASA space observatory as part of a NASA guest investigator/guest observer program element. Phase-2 is a proposal for funding. An NOI may or may not be requested, and the Phase-1 observing request must be submitted to the observatory web page by the proposal due date in Tables 2 and 3 of this NRA.

At the time of release, this ROSES-2016 NRA contains four guest investigator/guest observer program elements using the two-phase proposal process: Swift Guest Investigator (D.5), Fermi Guest Investigator (D.6), NuSTAR Guest Observer (D.10) and ASTRO-H Guest Observer – Cycle 1 (D.11).

Phase-1 observing requests for these programs cannot be submitted via either NSPIRES or Grants.gov. They must be submitted via the URL given in the Summary Table of Key Information given at the end of program element description. The Phase-2 proposal for funding must be submitted via NSPIRES by a proposal due date that will be announced when NASA announces the disposition of the Phase-1 observing requests. The process and requirements for the submission of Phase-1 observing requests and Phase-2 proposals may differ for each program element; proposers should read carefully the relevant program element Appendix to this ROSES NRA.

#### (c) Proposal Submission Due Dates and Deadlines

For each program element in Appendices A through E of this NRA, the electronic proposal must be submitted in its entirety by an Authorized Organizational Representative (AOR) no later than the proposal deadline on the appropriate proposal due date given in Tables 2 or 3 of this NRA. Unless stated otherwise in the relevant appendix to this NRA, the proposal deadline is 11:59 p.m. Eastern Time. Unless otherwise specified, all proposals must be submitted electronically using either NSPIRES or Grants.gov (see Sections IV(b)(i–iii) above).

Proposals submitted after the proposal due date and deadline will be considered "late." Proposals that are late will be handled in accordance with the [SMD Policy on Late Proposals](#). Proposals

received after the due date may be rejected without review. If a late proposal is rejected, it is entirely at the discretion of the proposer whether or not to resubmit it in response to a subsequent appropriate solicitation. It is not possible to submit a late proposal electronically via NSPIRES unless the electronic *Cover Page* was initially created prior to the proposal due date.

(d) Proposal Funding Restrictions

In addition to the funding restrictions and requirements given in the [NASA Guidebook for Proposers](#) and the *NASA GCAM*, the following restrictions are applicable to this ROSES NRA.

- The estimated funding and number of proposals anticipated to be funded, as shown in the Summary of Key Information at the end of each program element, are subject to the availability of appropriated funds, as well as the submission of a sufficient number of proposals of adequate merit.
- Other than the special cases discussed in Section 2.3.10(c)(ii) of the *NASA Guidebook for Proposers*, and unless specifically noted otherwise in the specific ROSES Appendix and or program element, the proposing PI organization must subaward the funding of all proposed Co-Is who reside at other non-Government organizations, even though this may result in a higher proposal cost because of subawarding fees. Potential exceptions to this rule include, but are not limited to, the awards that stem from the Suborbital-Class Platforms (see Section V). Other rare exceptions will be considered on a case by case basis when requested in the proposal and found to be in the interest of the Government and consistent with appropriate law, regulation, policy, and practice.
- Unless otherwise noted in the solicitation, SMD will send funds directly to Co-Is at NASA centers and other Government laboratories, including JPL. Thus, if a proposal submitted by a university has a Government Co-I, the funds will not pass through the university, so the university (or other institution that receives a grant) should not include overhead or any other pass through charges on those funds. Funds for Co-Is who do not work for the Government would pass through the university and those charges may be applied. Regardless of whether a Co-I will be funded through a subaward via the proposing institution or funded directly by NASA, the cover page budget for the proposal must include all funding requested from NASA for the proposed investigation, including salaries for NASA civil servants, see Section IV(b)(iii). Time for Co-Is and costs of procurements (not labor or overhead) at NASA centers and other Government laboratories should be justified in the proposal's Budget Narrative. No indirect burden from non-governmental organizations should be applied to funds for Co-Is at NASA centers and other Government laboratories. (See Section 2.3.10(c)(ii) of the *NASA Guidebook for Proposers*).
- Allowable costs are governed by 2 CFR Part 200. In general, the construction of facilities is not an allowed activity for any of the program elements solicited in this NRA. As described in the GCAM Section 4 (Limitations), facilities are different and distinct from equipment, which may be an allowable expense.
- Travel, including foreign travel, is allowed as may be necessary for the meaningful completion of the proposed investigation, as well as for publicizing its results at appropriate professional meetings. Proposers from NASA Centers should consult the latest NASA policy document regarding restrictions on travel funding. Note that selection of a proposal and approval of a proposed budget that includes travel for civil servants does not guarantee that a

NASA Center has sufficient travel authority to approve the proposed travel under NASA's reduced travel budget.

- In general, proposals for sponsorship of topical conferences, workshops, consortia, or symposia meeting certain criteria are solicited through the ROSES program element Topical Workshops, Symposia, and Conferences (Appendix E.2).
- Regardless of whether a conference is sponsored by NASA, individual conference travel by grantees is permitted and proposers from universities may include a budget for travel to conferences and workshops. Proposers from NASA Centers should consult their Center implementing policy on the latest NASA guidance on conference spending and reporting requirements. Note that selection of a proposal and approval of a proposed budget that includes travel for civil servant does not guarantee that a NASA Center has sufficient travel authority under NASA's reduced travel budget to approve the proposed travel.
- Profit for commercial organizations is not allowable under grant or cooperative agreement awards, but is allowable under contract awards. Costs for managing the project may be allowed. These costs, whether direct charges or part of the indirect cost agreement, must be consistent with 2 CFR 200 Subpart E.
- NASA funding may not be used for subcontracted foreign research efforts. U.S. research award recipients may directly purchase supplies and/or services from non-U.S. sources that do not constitute research, but award funds may not be used to fund research carried out by non-U.S. organizations. However, a foreign national may receive remuneration through a NASA award for the conduct of research while employed either full- or part-time by a U.S. organization (see Section 1.6 of the *NASA Guidebook for Proposers*; see also Appendix B, part (c)(8)(iv)). Special restrictions apply to collaboration with China, see Section III(c).
- Travel by a participant in the research investigation, whether for the purpose of conducting the research, for collaboration, or for attending a conference, is considered to be a research expense. NASA conducts its collaborations with foreign institutions on a no-exchange-of-funds basis. NASA funding may not be used for research efforts by foreign organizations at any level. Therefore, NASA funding may not be used for travel expenses by any team member who is not participating as a member of a U.S. organization (see Section 1.6 of the *NASA Guidebook for Proposers*; see also Appendix B, part (c)(8)(iv)).
- As noted in the *NASA Guidebook for Proposers*, costs of preparing, publishing, and disseminating the results of NASA funded research (e.g., page charges, open access fees, etc.) may be included in research proposals and are allowable charges against the grant, as long as the charges are levied impartially on all research papers published by the journal.
- Non-NASA U.S. Government organizations should propose based on full-cost accounting, unless no such standards are in effect; in that case such proposers should follow the Managerial Cost Accounting Standards for the Federal Government as recommended by the Federal Accounting Standards Advisory Board (for further information, see <http://www.hq.nasa.gov/fullcost>). Proposal budgets must include all costs that will be paid out of the resulting award.
- Regardless of whether functioning as a team lead or as a team member, personnel from NASA Centers must propose budgets consistent with the current NASA accounting

implementation for the requested year of performance. All NSPIRES cover page budgets must include all costs that will be paid out of the resulting award, including salaries and overhead for NASA civil servants. Costs that will not be paid out of the resulting award, but are paid from a separate NASA budget (e.g., center management and overhead; CM&O) and are not based on the success of this specific proposal, should not be included in the proposal budget. For example, CM&O should not be included in the proposal budget while other direct charges (including procurements and labor) to the proposed research task should be included. NASA civil servant Co-Is must provide their costs to the proposing organization so that the proposing organization may complete the cover page budgets in NSPIRES.

## V. SUBORBITAL-CLASS INVESTIGATIONS

### (a) Overview of Suborbital-Class Platforms

In each SMD Research Program (Earth Science, Heliophysics, Planetary Science, Astrophysics), flight investigations that require access to space or near-space are solicited. Flight investigations solicited through ROSES generally have modest costs and reduced mission assurance requirements appropriate for the research program, and these investigations are referred to as suborbital-class investigations. Platforms for suborbital-class investigations include aircraft, balloons, sounding rockets, suborbital reusable launch vehicles, CubeSats, and small International Space Station (ISS) payloads. General requirements for proposals to use any of these platforms, with the exception of aircraft, are discussed in this section of ROSES. Requirements for proposals using aircraft are discussed within the description of the Earth Science Research Program found in Appendix A.

Generally speaking, proposals for investigations that are carried out through development, launch, and operation of a short duration orbital experiment, such as one on a CubeSat or ISS-based project, are permitted in any ROSES program element that solicits investigations for use on suborbital-class platforms. In this sense, a CubeSat or an ISS-based investigation is a "suborbital class" investigation, even though it will be placed into orbit. CubeSat or ISS-based "suborbital class" investigations are subject to the same cost constraints to which traditional suborbital investigations are subject. Proposals for life and microgravity science investigations are not solicited through ROSES. Life and microgravity science investigations are solicited by the Human Exploration and Operations Mission Directorate. For further information contact David Tomko, Human Research Program and Fundamental Space Biology, NASA Headquarters, Washington, DC 20546; Tel.: 202-358-2211; E-mail: [dtomko@nasa.gov](mailto:dtomko@nasa.gov).

### (b) Points of Contact for Suborbital-Class Platforms

NASA provides different avenues for procurement of suborbital launch vehicle services, including: sounding rockets provided by the NASA Sounding Rockets Program Office (SRPO) at the NASA Goddard Space Flight Center/Wallops Flight Facility (NASA/GSFC/WFF), balloons provided by the NASA Balloon Program Office (BPO) at the NASA/GSFC/WFF, and suborbital reusable launch vehicle (sRLV) services provided by the NASA Space Technology Mission Directorate's (STMD) Flight Opportunities Program (FOP). SMD also solicits investigations as CubeSats and as small International Space Station payloads. Regardless of which launch vehicle service is anticipated, all prospective PIs are required to demonstrate the capacity, availability, and commitment of the suborbital-class platform to support their investigation. PIs are strongly urged to discuss prospective investigations with NASA program

personnel (see below) prior to submitting their proposal to ensure that probable operational costs are properly anticipated.

(i) NASA-provided Sounding Rocket Services

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

The nominal U.S. launch sites for sounding rockets are White Sands Missile Range (WSMR) in New Mexico, Wallops Island in Virginia, Poker Flat Rocket Range (PFRR) in Alaska, and Reagan Test Site (RTS) in the Kwajalein Atoll. The SRPO also conducts launches from the established non-U.S. launch sites at Andoya, Norway; Kiruna, Sweden (Esrangle); or Woomera, Australia; subject to science community requirements and the availability of SRPO operations funding to conduct the campaign.

Investigators proposing payloads to be flown on sounding rockets should answer the program-specific questions on the NSPIRES proposal cover pages. This information is needed by the SRPO to generate a rough order of magnitude cost estimate for the operational requirements associated with a proposed investigation and is used for planning purposes. The required information includes the envisioned vehicle type, payload mass, trajectory requirements, launch site, telemetry requirements, attitude control, or pointing requirements, and any plans for payload recovery and reuse.

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

Philip Eberspaker  
Sounding Rockets Program Office  
Code 810  
GSFC/Wallops Flight Facility  
National Aeronautics and Space Administration  
Wallops Island, VA 23337  
Telephone: (757) 824-2202  
E-mail: [Philip.J.Eberspaker@nasa.gov](mailto:Philip.J.Eberspaker@nasa.gov)

(ii) NASA-provided Balloon Services

Information on the capabilities of current available balloon vehicles is available at <http://sites.wff.nasa.gov/code820/operations.html> and at <http://www.csbf.nasa.gov/balloons.html>. Proposers are encouraged to consider these capabilities in designing their investigations, but the Balloon Program Office (BPO) has the final authority in the choice of which vehicles to be used.

The nominal U.S. launch sites for Balloons are Fort Sumner, New Mexico, and at the Columbia Scientific Balloon Facility in Palestine, Texas. The BPO also conducts launches from established non-U.S. launch sites at McMurdo, Antarctica; Alice Springs, Australia; Kiruna, Sweden (Esrangle); or Wanaka, New Zealand, subject to science community requirements and the availability of BPO operations funding to conduct the campaign.

Proposers needing investigation unique engineering, flight support systems, and/or technical support services from NASA, such as the Wallops Arc-Second Pointing System (WASP), should contact the BPO directly for an estimate of the Government Furnished Equipment (GFE) cost of the desired support.

Investigators proposing balloon payloads should contact the BPO to obtain technical information related to BPO balloon capabilities, services, and the latest planned campaign schedules.

Questions concerning balloons may be addressed to:

Debora Fairbrother  
Balloon Program Office  
Code 820  
GSFC/Wallops Flight Facility  
National Aeronautics and Space Administration  
Wallops Island, VA 23337  
Telephone: (757) 824-1453  
E-mail: [debora.a.fairbrother@nasa.gov](mailto:debora.a.fairbrother@nasa.gov)

### (iii) Suborbital Reusable Launch Vehicles

Suborbital Reusable Launch Vehicles (sRLV) offer newly developed commercial capabilities for the conduct of NASA scientific research, education, and technology advancement. The NASA STMD's Flight Opportunities Program (FOP) has issued commercial contracts to several sRLV flight service providers. Information on sRLV vehicles, including general vehicle capabilities and contact information for some vendors, is available at <http://flightopportunities.nasa.gov/platforms>. Until NASA establishes a policy to sponsor spaceflight participants onboard sRLVs, the FOP will not sponsor participants to fly on commercial balloon or suborbital reusable launch vehicles. The payloads to be flown on sRLV flights must either be automated or remotely operated. The remote operation capability should be confirmed with the flight operator.

Proposals for investigations using sRLVs as platforms must be for complete investigations, and must describe a complete suborbital science investigation, including payload construction, vehicle integration, launch and flight operations, data analysis, and publication of results. Proposers interested in using sRLVs as platforms to conduct an Earth or space science investigation must identify a vehicle that can provide the technical capabilities required to conduct the proposed investigation.

Proposals for investigations using sRLVs as platforms must specify the technical requirements that their investigation places on the vehicle. The proposal must include a Letter of Endorsement from a commercial vendor that (i) describes how that vendor's vehicle will meet the investigation requirements and provides technical information on how the vehicle will meet the investigation requirements, (ii) states that the vehicle will be available for use at the time proposed for flight and provides information showing a plan for getting from the current vehicle status to flight status, and (iii) provides a quoted cost for the flight and all other services that are required from the vehicle vendor to enable and conduct the proposed investigation.

Proposals for investigations using sRLVs as platforms must provide a description of the instrument; its current status; a clear assessment of what it will take to develop, modify, and

integrate the instrument onto the sRLV; and include a plan to provide calibrated, research grade data.

The cost to SMD for the flight and all other services provided by the sRLV vendor must be clearly stated in the proposal but not in the proposed investigation budget. All other costs for conducting the investigation must be included in the PI's proposed investigation budget. Upon final selection for flight, the flight and all other services provided by the sRLV vendor will be procured directly by the FOP and will not be funded through the PI's award.

SMD will conduct an sRLV continuing investigation review (CIR) for all sRLV-based projects. The CIR will take place following maturity of the sRLV-based project to the equivalent of a Phase A concept study report or a systems requirement review. The CIR will include payload description, flight performance assessment, proposed payload configuration and interfaces, mission success criteria, requirements matrix, operational requirements, launch vehicle, and project schedule. Once the sRLV-based project reaches that level of design maturity, the CIR will be held at NASA Headquarters. The SMD Associate Administrator (or designee) is the decision authority for approval to proceed beyond the CIR. It is expected that sRLV-based projects will spend no more than approximately \$100K prior to CIR approval. A proposal for a sRLV-based project must describe the proposed schedule for CIR and the proposed funding required to reach CIR.

Proposals for sRLV-based investigations must be submitted to the appropriate ROSES program element, depending on the science addressed by the proposed investigation. The proposed sRLV-based investigation must meet the constraints of the program element to which it is being proposed. This explicitly includes any constraints on the areas of science that are solicited, on the available funding, and on the requirement for a complete science investigation.

All proposals will be evaluated with respect to the criteria specified in Section C.2 of the *NASA Guidebook for Proposers*. In addition to the factors specified in the *Guidebook*, the intrinsic merit of a proposal shall include the following additional factors:

- The extent that the proposed sRLV offers an advantage (e.g., scientific, technical, or cost) over other suborbital-class platforms (including sounding rockets, balloons, and aircraft);
- The likelihood that the proposed vehicle will be available at the proposed time for flight and that it will be capable of providing the required technical capabilities;
- The feasibility of the proposed technical investigation, including the concept for conduct of the experiment during the suborbital flight and the plans for calibrating and analyzing the data obtained to accomplish the proposed science objectives; and
- The quality of the plans for completing the preliminary design prior to the investigation confirmation review;

In addition to the factors specified in the *Guidebook*, the cost realism and reasonableness of a proposal shall include:

- The affordability to SMD of the proposed vehicle vendor cost for the flight and other required services.

Note that the Flight Opportunities Program is available to assist the PI with this process. Investigators proposing sRLV payloads are strongly urged to discuss prospective investigations

with operations personnel in the Flight Opportunities Program and/or a potential vendor to ensure that probable integration, safety and mission assurance, and operational costs are properly anticipated.

Questions concerning potential sRLV investigations may be addressed to:

LK Kubendran  
Flight Opportunities Program  
Space Technology Mission Directorate  
NASA Headquarters  
Washington, DC 20546  
Telephone: (202) 358-2528  
E-mail: [lk@nasa.gov](mailto:lk@nasa.gov)

(iv) Research Investigations utilizing the International Space Station

NASA has determined that there may be payload opportunities for small, suborbital-class space and Earth science research investigations, including both science and technology development, that utilize the International Space Station (ISS). Available external attach points include both zenith and nadir pointing locations and internal attach points, including nadir pointing locations. NASA has available annual external launch opportunities after 2016 on the Japanese HTV launch vehicle and the SpaceX vehicle. NASA also has regular opportunities on a suite of vehicles to launch pressurized cargo for use in the Window Observational Research Facility (WORF). Information on the opportunities and constraints for ISS attached payloads may be found at [http://www.nasa.gov/mission\\_pages/station/research/research\\_information.html](http://www.nasa.gov/mission_pages/station/research/research_information.html).

Proposals seeking use of the ISS must take advantage of the Station's unique capabilities. In order to be compliant, a proposal must include a clear and convincing scientific and/or technical argument that use of the ISS is required to produce the needed results in ways that could not be accomplished through the use of other platforms. Investigations that make use of the ISS may be proposed for periods of performance of up to five years.

Proposers interested in using the ISS to conduct an Earth or space science investigation must identify a specific accommodation location that can provide the technical capabilities required to conduct the proposed investigation. The proposal must include a letter of feasibility from the NASA Space Station Payload Office. This letter of feasibility must contain: (1) a preliminary assessment of the feasibility for proposed provisions for access to and accommodation at the Space Station, (2) identification of any significant challenges or conditional provisions for access and accommodation, and (3) a description of the level of technical interchange or negotiation required to mature the proposed provisions for access and accommodation. Transportation and accommodation will be provided by NASA at no cost to the proposed research investigation, and costs for transportation to and accommodation on the ISS should not be included in the proposed budget. However, the PI's cost for all accommodation, safety, and other reviews that are conducted and supported by the PI must be included in the PI's proposed investigation budget.

In addition to proposal requirements specified in the appropriate ROSES program element, proposals for investigations utilizing the ISS must provide a description of the instrument; its current status; a clear assessment of what it will take to develop, modify, and integrate the instrument onto the ISS; and include a plan to provide calibrated, research grade data in SI

traceable units. Proposals must be for complete investigations that include payload construction, ISS integration, launch and flight operations, data analysis, and publication of results.

The ISS Customer Integration Office will provide integration services, launch services, on-orbit operations and services, as well as safety and mission assurance reviews for all ISS investigations.

Proposals must be submitted to the appropriate ROSES program element depending upon the science addressed by the proposed investigation. The proposed investigation must meet the constraints of the program element to which it is being proposed. This explicitly includes any constraints on the areas of science that are solicited, on the available funding, and on the requirement for a complete science investigation.

Investigations proposed for the ISS will be approved for the first year only. During the first year, in addition to beginning the proposed investigation, a detailed transportation and accommodation study will be undertaken with the ISS Customer Integration Office. Approval for continued funding beyond the first year will be contingent on the ISS Program making a firm commitment for transportation and accommodation on the ISS that is compatible with the requirements of the proposed investigation.

All proposals will be evaluated with respect to the criteria specified in Section C.2 of the *NASA Guidebook for Proposers*. In addition to the factors specified in the *Guidebook*, the intrinsic merit of a proposal shall include the following additional factors:

- The extent that the advantages (e.g., scientific, technical, or cost) of the International Space Station's capabilities and location will be utilized; and
- The feasibility of the proposed technical investigation, including the concept for conduct of the experiment during the flight and the plans for calibrating and analyzing the data obtained to accomplish the proposed science objectives.

External accommodations for payloads include Express Logistics Carriers (ELCs) mounted to the ISS truss structure, the Japanese Experiment Module-Exposed Facility (JEM-EF), and the Columbus Orbiting Facility-Exposed Facility (COF-EF). Internal accommodations are also available in the pressurized environment via the Window Observational Research Facility (WORF). More detailed information can be found at [http://www.nasa.gov/pdf/462947main\\_2010\\_June\\_Jones\\_ISS%20Accomodations1.2a.pdf](http://www.nasa.gov/pdf/462947main_2010_June_Jones_ISS%20Accomodations1.2a.pdf).

Attached payloads must be certified for transportation and use in a human tended vehicle. External payloads would be required to complete PDR approximately 36 months before launch, CDR approximately 24 months before launch, and be delivered for certification and integration approximately nine months before launch. Pressurized cargo for the WORF would be required to complete PDR approximately 12 months before launch, CDR approximately nine months before launch, and be delivered for certification and integration approximately four months before launch.

Investigators proposing ISS payloads are strongly urged to discuss International Space Station payload constraints, launch opportunities, and other technical matters with the ISS Research Integration Office.

For further information, please contact:

Sharon C Conover  
ISS Research Integration Office/OZ  
Johnson Space Center  
National Aeronautics and Space Administration  
Houston, TX 77058  
Telephone: 281.244.8518  
E-mail: [sharon.c.conover@nasa.gov](mailto:sharon.c.conover@nasa.gov)

(v) Use of Short Duration Orbital Platforms, including CubeSats

Short duration orbital platforms, such as CubeSats (built in increments of 10 centimeter cubes), have historically been used as teaching tools and technology demonstrations, and now may offer newly developed capabilities for the conduct of NASA scientific research and technology advancement. CubeSats can be built as a single unit (1U), weighing less than 1.33 kg, or combined in units of two, three or six.

CubeSats: Proposals for science investigations utilizing short duration orbital platforms, such as CubeSats, must be for complete investigations, and must describe a complete science investigation, including CubeSat construction, payload integration and test, launch vehicle integration, communications, mission operations, data analysis, and publication of results.

Launch: Launch services will be provided under the NASA/HEOMD CubeSat Launch Initiative (CSLI) at no cost to the investigation. The CubeSat Launch Initiative (CSLI) program regularly provides launch opportunities for small satellites to fly as secondary (auxiliary) payloads on rockets planned for upcoming U.S. Government missions. Under the CSLI process, an Agency-wide selection recommendation committee considers candidate CubeSats for selection from among those proposed from organizations both internal and external to NASA. At an appropriate time following selection, SMD will provide direction for being considered for manifest on a launch vehicle going to an appropriate orbit.

CubeSats are typically launched as secondary payloads to low-Earth orbit or from the International Space Station. Further, additional commercial opportunities to leave Earth orbit as a secondary payload may arise on future mission launches. Information on the EM-1 stand-alone CubeSat opportunity, can be found by contacting the CubeSat points of contact listed below.

For more information about the CSLI, including previously-selected respondents, see [http://www.nasa.gov/directorates/heo/home/CubeSats\\_initiative.html](http://www.nasa.gov/directorates/heo/home/CubeSats_initiative.html).

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

NASA's CubeSats are deployed from a Poly-Picosatellite Orbital Deployer, or P-POD. CubeSats must be compliant with the NASA/KSC Launch Services Program (LSP) Program Level Poly-

Picosatellite Orbital Deployer (PPOD) and CubeSat Requirements Document and the Compliance and Reference Documents referenced therein. That document may be found at:

[http://www.nasa.gov/pdf/627972main\\_LSP-REQ-317\\_01A.pdf](http://www.nasa.gov/pdf/627972main_LSP-REQ-317_01A.pdf)

Investigators proposing CubeSats in response to this solicitation are expected to comply with the requirements of NASA Procedural Requirement (NPR) 7120.8, NASA Research and Technology Program and Project Management Requirements, and should appropriately tailor these requirements, depending on the project size, complexity, and scope.

Proposals for CubeSat investigations should note the following:

- The proposed CubeSat investigation must meet the constraints of the program element to which it is being proposed. This explicitly includes any constraints on the areas of science that are solicited, on the available funding, and on the requirement for a complete science investigation.
- Proposals will be evaluated with respect to the criteria specified in Section C.2 of the *NASA Guidebook for Proposers*. In addition to the factors specified in the *Guidebook*, the proposal will be evaluated against any additional factors called out in the program element to which it is being proposed.
- Proposals for investigations using CubeSats must satisfy the constraints for a standard CubeSat (one "Cube" or "1U" defined above) and the NASA CubeSat deployer.
- Proposals must specify any constraints placed on the required orbit and orbital lifetime. The likely availability of NASA launches satisfying any constraints in the time period contemplated will be a consideration for the ROSES evaluation. The less stringent the orbital constraints, the more probable it will be that NASA can manifest the CubeSat investigation for launch.
- Proposals must demonstrate knowledge of the requirements for limiting orbital debris and must address how the mission will meet the requirements of NPR8715.6 NASA Procedural Requirement for Limiting Orbital Debris.
- Proposals must address the approach to downlink and uplink communications licensing, frequency band selection, and frequency coordination for operations between space and ground within the RF spectrum.
- All costs for preparing and delivering the CubeSat for launch must be included in the proposal. No launch service charges should be included in the proposal cost request.
- Proposals for short duration orbital experiments other than CubeSats must include provisions for access to space as part of the proposal.

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

For further information on SMD CubeSats, please contact:

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

For further information on CSLI, please contact:

Anne E Sweet,  
Launch Services Program Executive,  
Phone: 202-358-3784,  
E-mail: [anne.sweet-1@nasa.gov](mailto:anne.sweet-1@nasa.gov)

or

Jason C Crusan,  
Director, Advanced Exploration Systems,  
Phone: 202-358-0635,  
E-mail: [jason.c.crusan@nasa.gov](mailto:jason.c.crusan@nasa.gov)

### (c) General Guidelines for Suborbital-Class Investigation Proposals

ROSES supports science investigations and/or technology development utilizing payloads flown on suborbital-class platforms, as defined in Section I(b), or as flights of opportunity. Suborbital-class payloads may be recovered, refurbished, and reflown, in order to complete an investigation. A discussion of the plans for management and for reduction and analysis of the data must be given in the proposal. Although most awards are for three or four years' duration, a five-year proposal may be accepted to develop a completely new, highly meritorious investigation through its first flight.

Budgets are expected to cover complete investigations, including payload development and construction, instrument calibration, launch, data analysis, and publication of results. The number of investigations that can be supported is limited and heavily dependent on the funds available to the relevant research program. Note that NASA does not carry reserves to accommodate any cost overrun incurred by a particular investigation, including the damage and/or loss of the payload owing to a suborbital-class platform system failure. Therefore, failure to achieve the proposed goals within the proposed time and budget could require either descoping the initially proposed investigation, delaying it, canceling a particular launch date opportunity, or canceling the investigation altogether. Unlike most other ROSES investigations where the proposing PI organization must subcontract funding to non-Government investigators, suborbital-class investigations will sometimes be split into multiple awards, depending on circumstances. Please read the individual ROSES Appendix and consult with the POC.

## VI. PROPOSAL REVIEW INFORMATION

### (a) Evaluation Criteria

As stated in the [NASA Guidebook for Proposers](#), proposals ordinarily are evaluated on three criteria: intrinsic merit, relevance, and cost realism and reasonableness. [NASA Guidebook for Proposers](#) Section 1.2.3 Proposal Review and Selection indicates that peer review will be used to determine merit, and that "NASA peer review members may also participate in determining the relevance...and cost realism and reasonableness", but that the evaluation of cost and relevance may be done by NASA. Consistent with this, ROSES proposals may be scored by peer reviewers for all three criteria, or may be scored for only merit, with comments provided for relevance and cost, or the peer review panel may not be asked to comment on relevance and cost at all. NASA may return a proposal without peer review if it is not relevant. Note the following specific points:

- Some of the program elements discussed in Appendices A through E will give specific factors, based on the solicited research objectives, which will be considered when evaluating a proposal's science and/or technical merits and/or its relevance to program objectives.
- Unless otherwise stated, relevance will be judged by whether the proposal addresses goals and objectives for that ROSES Appendix and/or specific program element, rather than NASA's broader goals. This focus on relevance to the program element supersedes the instructions in the [NASA Guidebook for Proposers](#). Unless otherwise stated in the program element, relevance of the proposed work is judged based on whether the work proposed is deemed to be relevant, independent of whether or not it includes an overt, clear and direct statement of relevance. That is, unless otherwise stated in the program element, no proposal will be returned as noncompliant for lack of a relevance section or statement, and inclusion of a relevance section or statement is no guarantee that the proposal will be judged relevant. Please read the program elements carefully. See also Section I(h).
- Cost data for U.S. proposals may be evaluated both by peer review (for cost realism and cost reasonableness) and by NASA program personnel. Proposers must follow the budget requirements in Section IV (b) iii and Table 1 of this document. When evaluating the cost reasonableness of the proposals, reviewers will assess whether the proposed level of effort (i.e., labor FTEs) and the proposed other direct costs (i.e., supplies, equipment, travel) are commensurate with those required to accomplish the goals of the investigation. Salary levels, fringe benefit rates, and overhead rates are not part of that evaluation, and will be hidden from peer reviewers.
- Except in rare instances where it is explicitly acknowledged in the program element, neither the existence of proposed voluntary cost sharing nor the lack thereof or the magnitude of such cost sharing will be used as evaluation criteria or as a precondition for award. If voluntary cost sharing is proposed, the proposer should describe, in detail, any proposed cost sharing arrangements (see Section III(d) above). Please note that the Summary of Proposal Personnel and Work Effort is no longer in the budget section and the *Guidebook* explicitly notes that any planned work commitment not funded by NASA is not considered cost sharing as defined in 2 CFR § 200.29.
- Prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold (currently \$150,000), NASA is required to review and consider any information about the applicant that is in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System—FAPIIS) accessible through the System for Award Management (SAM, <https://www.sam.gov>) (see 41 U.S.C. 2313). An applicant, at its option, may review information in FAPIIS and comment on any information about itself that NASA previously entered and is currently in FAPIIS. NASA will consider any comments by the applicant, in addition to the other information in FAPIIS, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 2 CFR 200.205 Federal awarding agency review of risk posed by applicants.

(b) Review and Selection Processes

Review of proposals submitted to this NRA will be consistent with the general policies and provisions given in Sections C.1 through C.4 of Appendix C of the *Guidebook*, and selection

procedures will be consistent with the provisions of Section C.5 of that document. In this NRA, the desire to achieve a balance of efforts across the solicited program objectives may play a role in the selections.

Unless otherwise specified, the SMD Division Director responsible for a research program element (or his/her delegate) is its Selection Official.

(c) Selection Announcement and Award Dates

SMD's goal is to announce selections within 150 days of the proposal due date and within 60 days after the conclusion of the peer review. Selections are typically announced between 150 days and 220 days after the proposal due date. Although there are many reasons why selections are not announced earlier, the most common are the uncertainty in the NASA budget at the time selection decisions could be made and the time required to conduct an appropriate peer review and selection process. NASA does not usually announce new selections until the funds needed for those awards are approved through the Federal budget process. Therefore, a delay in the budget process for NASA usually results in a delay of the selection announcement date. After 150 days have passed since the proposal due date, proposers may contact the responsible Program Officer listed at the conclusion of that program element and on the [SARA web page](#) (see Section VIII). If the program officer does not respond proposers may send an inquiry to [SARA@nasa.gov](mailto:SARA@nasa.gov)

In order to announce selection decisions as soon as is practical, even in the presence of budget uncertainties, the Selection Official may make and announce selection decisions about some proposals and defer decisions on others. If a Selection Official uses this option, then proposers may be told that a proposal has been "selected," "declined," or that a decision has not yet been made. If a decision has not yet been made then those proposals remain "selectable" and will be considered for a supplemental selection when circumstances allow. Eventually proposers will be notified whether their proposal is selected or is no longer being considered for selection. All proposers will be notified via NSPIRES and provided with a written review (usually the panel evaluation) of the proposal. Proposers may contact the Program Officer for a "debriefing," e.g., to clarify something that is unclear in the evaluation or for an explanation of whether there were factors other than the peer review that played a role in the decision.

(d) Processes for Appeals

(i) Reconsideration by SMD

SMD has a process for requesting reconsideration of the declination of a proposal submitted in response to an SMD NASA Research Announcement. Reconsideration may be requested if the PI believes that the proposal was not handled correctly. This process may be found at in the [SMD Reconsideration Policy](#) document available in the Library section of the [SARA website](#) at <http://nasascience.nasa.gov/researchers/sara/library-and-useful-links> (the SARA website is at <http://sara.nasa.gov>).

(ii) Ombudsman Program

The NASA Procurement Ombudsman Program is available under this NRA as a procedure for addressing concerns and disagreements. The clause at NASA FAR Supplement (NFS) 1852.215-84 ("Ombudsman") is incorporated into this NRA.

The cognizant ombudsman is

Director, Contract and Grant Policy Division  
Office of Procurement  
NASA Headquarters  
Washington, DC 20546-0001  
Telephone: 202-358-4483  
E-mail: [agency-procurementombudsman@nasa.gov](mailto:agency-procurementombudsman@nasa.gov)

(iii) Protests

Only contract awards are subject to bid protest, either at the Government Accountability Office (GAO) or with the Agency, as defined in FAR 33.101. The provisions at FAR 52.233-2 (Service of Protest) and NFS 1852.233-70 (Protests to NASA) are incorporated into this NRA. Under both of these provisions, the designated official for receipt of protests to the Agency and copies of protests filed with the GAO is

Assistant Administrator for Procurement  
Office of Procurement  
NASA Headquarters  
Washington, DC 20546-0001  
Telephone: 202-358-2090

(e) Service as a Peer Reviewer

The success of NASA's research program rests on the quality of peer review. NASA will contact expert investigators and ask them to serve as peer reviewers. Since those whose proposals were selected in prior competitions are highly qualified and may not be submitting a proposal to the current competition, they are highly encouraged to serve on SMD peer review panels. Potential reviewers are encouraged to volunteer to be reviewers by filling out one of the review forms at <http://science.nasa.gov/researchers/volunteer-review-panels/> or by sending an E-mail to one of the [program officers](mailto:program_officers) or to [sara@nasa.gov](mailto:sara@nasa.gov). It is good experience for early-career scientists, and the influx of new reviewers is healthy for the process.

## VII. AWARD ADMINISTRATION INFORMATION

(a) Notice of Award

All proposers will be officially notified via NSPIRES from which they will be able to retrieve their official decision letter and evaluation. If a proposal is selected, the business office of the offeror will be contacted by a NASA Grants Officer from the NASA Shared Services Center ([NSSC](#)), who is the only official authorized to obligate the Government. Any costs incurred by the offeror in anticipation of an award will be subject to 2 CFR Section 1800.209 Preaward costs. NASA waives the approval requirement for preaward costs of 90 days or less.

(b) Administrative and National Policy Requirements

This solicitation does not invoke any special administrative or national policy requirements: 2 CFR 1800, 14 CFR 1274, and the Grants and Cooperative Agreement Manual will apply to any awards that derive from this NRA, as applicable. All award requirements are posted at [https://prod.nais.nasa.gov/pub/pub\\_library/grantnotices/GrantNotices.html](https://prod.nais.nasa.gov/pub/pub_library/grantnotices/GrantNotices.html).

### (c) Award Reporting Requirements

The reporting requirements for awards made through this NRA will be consistent with 2 CFR 1800.902.

Award recipients may also be subject to reporting requirements under the NASA Plan for Increasing Access to Results of Federally Funded Research. Any such requirements will be identified in the Notice of Award.

If the Federal share of any award issued under this NRA is more than \$500,000 over the period of performance, additional reporting requirements will apply. [See 2 CFR 200 Appendix XII—Award Term and Condition for Recipient Integrity and Performance Matters.](#)

For science projects that receive assistance from the U.S. Antarctic Program, the acknowledgement should include: "Logistical support for this project in Antarctica was provided by the U.S. National Science Foundation through the U.S. Antarctic Program."

Any additional requirements will be specified in the program element description.

### VIII. POINTS OF CONTACT FOR FURTHER INFORMATION

General questions and comments about the policies of this NRA may be directed to:

Max Bernstein  
SMD Lead for Research  
Science Mission Directorate  
National Aeronautics and Space Administration  
Washington, DC 20546-0001  
E-mail: [sara@nasa.gov](mailto:sara@nasa.gov) (preferred)  
Telephone: (202) 358-0879

Note: Proposals must not be submitted to this address. Proposals must be submitted electronically, as described in Section IV above.

Specific questions about a given program element in this NRA should be directed to the Program Officer(s) listed in the Summary Table of Key Information at the end of each program element appendix. Up-to-date contact information for program officers can also be found online at the SARA web page's Program Officers List at <http://nasascience.nasa.gov/researchers/sara/program-officers-list>.

Inquiries about accessing or using the NASA proposal submission web interface located at <http://nspires.nasaprs.com> should be directed by an E-mail that includes a telephone number to [nspires-help@nasaprs.com](mailto:nspires-help@nasaprs.com) or by calling (202) 479-9376. This help center is staffed Monday through Friday, 8:00 a.m. – 6:00 p.m. Eastern Time.

Inquiries about accessing or using Grants.gov located at <http://www.grants.gov> should be directed by an E-mail to [support@grants.gov](mailto:support@grants.gov) or by calling (800) 518-4726 twenty-four hours a day, seven days a week, except Federal holidays when the center is closed.

## IX. ANCILLARY INFORMATION

### (a) Announcement of Updates/Amendments to Solicitation

Because this NRA is released far in advance of many of the deadlines given in Tables 2 and 3, additional programmatic information for any of its programs may develop before their proposal due dates. If so, such information will be added as a formal amendment to this NRA no later than 30 days before the proposal due date, or, if that is not possible, the proposal due date will be extended to allow 30 days for proposal submission from the date of the amendment. All amendments are posted on the main ROSES webpage at <http://solicitation.nasaprs.com/ROSES2016> (or by going to <http://solicitation.nasaprs.com/open> and selecting "NNH16ZDA001N"). Also, an RSS feed for amendments, clarifications, and corrections to ROSES can be found in one place (and there is an RSS feed) at <http://nasascience.nasa.gov/researchers/sara/grant-solicitations/roses-2016/>. NASA SMD will also send an electronic notification of any such amendments to all subscribers of its electronic notification system (see Section IX(c) below), it is the responsibility of the prospective proposer to check this NRA's homepage for updates concerning the program(s) of interest.

Any clarifications or questions and answers that are published will be posted on the relevant program element's web page, which can be found as described above.

### (b) Electronic Submission of Proposal Information

On-time electronic submission over the Internet is required for every proposal. While every effort is made to ensure the reliability and accessibility of the electronic proposal submission systems (NSPIRES and Grants.gov) and to maintain help centers via E-mail and telephone, difficulty may arise at any point, including the user's own equipment. Therefore, prospective proposers are urged to familiarize themselves with the submission system(s) and to submit the required proposal materials well in advance of the deadline of the program of interest. Difficulty in registering with or using a proposal submission system is not, in and of itself, a sufficient reason for NASA to consider a proposal that is submitted after the proposal due date (see Section IV(c) above). After submission via NSPIRES, proposers can verify proposal delivery by logging into NSPIRES and selecting "proposals" and "Submitted Proposals/NOIs."

### (c) Electronic Notification of SMD Research Solicitations

SMD maintains an electronic notification system to alert interested researchers of its research program announcements. Subscription to this service is free to all registered users of the NASA proposal database system at <http://nspires.nasaprs.com>. To add or change a subscription to the electronic notification system, users should login to the database system and select "Account Management" then "E-mail Subscriptions." Owing to the increasingly multidisciplinary nature of SMD programs, this E-mail service will notify all subscribers of (i) all NASA SMD research program solicitations regardless of their type or science objectives; (ii) amendments to all SMD solicitations that have been released for which the proposal due dates have not passed; and (iii) special information that SMD wishes to communicate to those interested in proposing to its sponsored research programs. Altogether, a subscriber may receive 50–75 notifications per year. SMD maintains this subscription list in confidence and does not attempt to discern the identity of its subscribers. Regardless of whether or not this service is used, all SMD research announcements may be accessed at <http://solicitation.nasaprs.com/open> by selecting

"NNH16ZDA001N" as soon as they are posted (typically by ~9:00 a.m. Eastern Time on their release date).

Note: Automated spam filtering software may identify SMD's electronic notifications as spam or junk mail. Subscribers are advised to ensure that E-mail received from "[NSPIRES-help@nasaprs.com](mailto:NSPIRES-help@nasaprs.com)" or "[nspires@nasaprs.com](mailto:nspires@nasaprs.com)" are not identified by any automated E-mail filtering system as unwanted E-mail.

NRA's issued by SMD are synopsisized on Grants.gov (<http://www.grants.gov>) at the time they are released. This ROSES NRA will be synopsisized upon its release. Amendments to this NRA that create new proposal opportunities will also be synopsisized on Grants.gov at the time of their release.

(d) Further Information on SMD Research and Analysis Programs

SMD maintains a website for improving communication with the research community. This site is maintained by the SMD Research Lead, is referred to as the SARA website, and is located at <http://sara.nasa.gov>. The SARA website contains information related to NASA's Science Research Programs, including the solicitations, selections, an RSS feed for changes to ROSES, and contact information for program officers.

(e) Archives of Past Selections

For more information about the types of research supported by the program elements solicited in previous editions of this NRA and other predecessor NRAs, the titles and abstracts of all investigations selected through previous solicitations (issued after January 1, 2005) are available by solicitation by year at <http://nspires.nasaprs.com>: click "Solicitations" and then "Closed/Past Solicitations and Selections," choose the year from the pop-down menu, and click the find button to see the abstracts in a PDF file. One can search the grants (only) that resulted from all NASA programs at <http://www.research.gov/> by selecting "[Search awards](#)" and then using the "[Advanced Search](#)" to search for NASA awards only. One can also search the grants (only) that resulted from all NASA programs, but not abstracts at <https://www.nssc.nasa.gov/grantstatus>.

(f) Meeting Geospatial Standards

NASA pioneered the development of metadata and the accessibility and interoperability of space and Earth science data. When grants result in the development of data that NASA both identifies as geospatial and intends to distribute, then NASA awards will require that documentation (metadata) meet Federal Geographic Data Committee standards. NASA will assure that this documentation is electronically accessible to the Clearinghouse network (<http://www.fgdc.gov/dataandservices/>) and discoverable through Geospatial One Stop (<http://geo.data.gov/>).

X. CONCLUDING STATEMENT

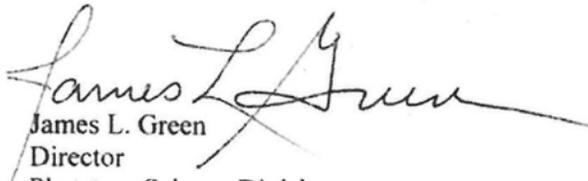
Through this ROSES NRA, NASA encourages the participation of the space and Earth science communities in its Science Mission Directorate research and technology programs. These programs, while quite diverse in objectives and types, in fact form the foundation of both the basic and applied research that allows NASA's space and Earth science programs to be properly planned and carried through to the successful interpretation of data and its application to the needs of end users. Comments about this NRA are welcome and may be directed to the point of contact for general questions and comments identified in Section VIII above.



Michael H. Freilich  
Director  
Earth Science Division



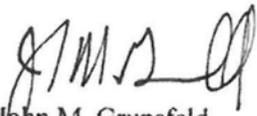
Steven W. Clarke  
Director  
Heliophysics Division



James L. Green  
Director  
Planetary Science Division



Paul L. Hertz  
Director  
Astrophysics Division



John M. Grunsfeld  
Associate Administrator  
Science Mission Directorate

Table 1: Checklist for ROSES-2016 Proposals

<p>This list does not apply to Step-1 proposals. Many items on this checklist may be superseded by the program element and, if there is a difference, the text in the program element takes precedence. See Also the 2016 version of the NASA <a href="#">Guidebook for Proposers</a>.</p>		
<p>Cover pages: Table 1 lists the few aspects that most commonly cause difficulties to proposers. There are many required parts to the cover pages, see the NSPIRES instructions.</p>		
	Team	Investigators must indicate participation via NSPIRES, except proposals submitted via grants.gov. If any team member doesn't confirm their participation the AOR will get an error that prevents submission.
	Team	Paid team members may not be collaborators, they should be Co-Is.
	Team	A critical partner with a sustained, continuing role is a Co-I, not a collaborator, even if unpaid.
	Project Summary	Project Summary (abstract) must be in the text box in the cover pages, not main body of the proposal. It has a built in 4000-character limit
	DMP	For most programs, the Data Management Plan (DMP) or explanation of why it is not needed must be provided in the 4000 character text boxes in the cover pages, unless otherwise stated in the program element. See Section II(c) and the <a href="#">ROSES FAQ</a> for important information.
	Budget	List all costs. Include all salary and indirect costs in the NSPIRES cover page budgets.
	Submission	Both the author must "release" the proposal and the AOR must "submit" prior to the due date.
	Other	There are cover page questions that must be answered and there may be other required content, e.g., some program elements in Appendix C collect a relevance statement here, see VI (a).
<p>Proposal document</p>		
	Table of contents	First required component of proposal. One page only
	Scientific/Technical /Management Section	Second required component and the main part of the proposal. The sequence for science content here is recommended, but proposers may order the elements as they prefer.
	Length restriction	Typically 15 pages (except for a Step-1 proposal) and more may be permitted for some (e.g., suborbital) programs and less for others (e.g., Planetary Major Equipment). Please read the program element and refer to the summary table of key information.
	Format	8.5" x 11.0" page size
	Format	Single spaced, single column text (unless otherwise specified).
	Format	One-inch margins on all four sides. No reviewable content in margins.
	Format	No more than 5.5 lines per inch
	Format	No more than 15 characters per inch
	Format	Times New Roman Font size 12 is always safe
	Figure Format	Text and content on/in figures must be easily legible without magnification.

Table 1 Continued: Checklist for ROSES-2016 Proposals

	Captions Format	Figure captions follow the same font restrictions as body of proposal. Don't put anything crucial only in the captions.
	Table Format	Text and content on/in Tables must be easily legible without magnification.
	Content	Discuss objectives and their significance.
	Content	Discuss perceived impact of the work.
	Content	Discuss relevance of the work to the solicitation. See VI (a)
	Content	Explain the technical approach and methodology.
	Content	Discuss potential sources of uncertainty
	Content	Present mitigation strategy or alternate approach given obstacles
	Content	Present roles of all team members so its clear what they are doing
	Content	Present a work plan, with milestones, management structure
	Content	Present a data sharing and/or archiving plan here in the text only if it is required by program element.
	Special Content	Provide other special requirements of program element, e.g., special statements for participating scientists, team leads, etc.
References: Third component of proposal		
	Length	No page limit
	Excluded	No references to documents (e.g., unpublished manuscripts) unavailable to reviewers. No links to personal websites.
Biographical sketches/Curriculum Vitae (CVs): fourth component of proposal		
	Required	One for the PI and each Co-I
	Length restriction	CV for PI - two pages or fewer, unless otherwise specified, such as Early Career Fellowship, which allows three pages
	Length restriction	CVs for anyone other than the PI are limited to one page
	Not required	CVs for collaborators are typically not needed, but may be included
Summary of work effort: This is a new fifth section of the proposal. Note, location differs from and supersedes that given in <i>Guidebook</i> .		
	General	Note this table has been moved from the budget Section. Where names are not known, include the position, such as postdoctoral fellow or technician.
	Required	Names and/or titles of all personnel to perform the proposed effort
	Required	Planned work commitment (e.g., in fractions of a work year) to be funded by NASA
	Required	Planned work commitment (e.g., in fractions of a work year) that will not be funded by NASA, if any. Note: time commitment included here that is not funded by NASA is not considered cost sharing, as defined in 2 CFR § 200.29.
Current and Pending Support: Sixth part of the proposal, not page limited.		
	Required	Required for the PI. Also required for funded team members who are proposed to devote $\geq 10\%$ of their time to the proposed work.

Table 1 Continued: Checklist for ROSES-2016 Proposals

	Required	For each current project or pending proposal list the level of effort for
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		that one team member (only) per year. Award values are not required.
	Excluded	Do not include Current and Pending for collaborators.
	Discouraged	Current and Pending for students is discouraged.
	Discouraged	Current and Pending for Foreign Co-Is is discouraged.
	Excluded	Do not self-reference this proposal in the current and pending
Statements of Commitment and Letters of Support, feasibility and Endorsement		
	General	Statements of Commitment by team members have been replaced by an indication of participation via the NSPIRES web interface.
	Statements of Commitment	Statements of Commitment must be included for proposals that were submitted via grants.gov since web confirmation is not possible
	Letter of Endorsement – only permitted under special circumstances.	In general, not permitted. Special cases include 1) Foreign Co-Is must include letters of endorsement from their government agency or funding/sponsoring institution in their country and 2) Letters from commercial vendor are required for proposals for investigations using sRLVs as platforms.
	Letter of Support	A letter of support is required from the owner of any facility or resource that is not under the PI's direct control, acknowledging that the facility or resource is available for the proposed use during the proposed period. See Section 2.3.9 of the <a href="#">Guidebook for Proposers</a>
	Letter of feasibility	A letter of feasibility from the NASA Space Station Payload Office must be included with proposals to use ISS.
	Letter of affirmation	In general, letters of affirmation are not permitted for normal research proposals, but letters from the community may be included only where explicitly allowed, e.g., for C.17 PME and E.2 TWSC.
Budget Justification: The eighth part of the proposal, no page limit overall.		
	General	Please explain in words what is being purchased and why it is reasonable. See the <a href="#">Guidebook for Proposers</a>
	Required	Budget Narrative: justify each proposed component of cost, including subcontracts/subawards, consultants, other direct costs (including travel), and facilities and equipment. Give the "basis of estimate;" quotes need not be provided, but the proposal should indicate that the cost was based upon a quote, prior experience, etc.
	Excluded	Do not include <b>any values for salary, fringe, or overhead.</b>
	Optional	Proposers need not specify anticipated award type (i.e., grant vs. contract), see <a href="#">II (a)</a>
Facilities and Equipment: The ninth part of the proposal, no page limit.		
	Length restriction	None, as needed
	Excluded content	Does not add scientific or technical information beyond a description of the facilities and equipment, i.e., don't add here what should be in the page-limited Scientific/technical Section.

Table 1 Continued: Checklist for ROSES-2016 Proposals

**[Separate Documents Section of the table was reformatted for clarity August 18, 2016]**

Detailed Budget: The tenth and final part of the proposal <b>document</b> .		
	Strongly	Detailed budget, itemizing expenses.

	Recommended	
	Strongly Recommended	Separate detailed budget from each subaward organization.
	Excluded	Do not include <b>any values for salary, fringe, or overhead</b> . This is reported only in the cover page budget and "Total" budget.
<b>Separate PDF documents from proposal document</b>		
	<b>"Total" Budget Document (separate PDF file attached as document type "Total Budget")</b>	
	<b>Required</b>	<b>Separately uploaded "Total" Budget PDF file see <a href="#">Section IV(b)(iii)</a>. [Added March 24, 2016]</b>
	HEC Appendix Document (separate PDF file <b>attached as document type "Appendix"</b> )	
	If necessary	If the Program Specific Data Question about the use of HEC was answered in the affirmative, a required appendix document must be provided. See Section I (d) for information about this new requirement

[TABLE 2: SOLICITED RESEARCH PROGRAMS \(IN ORDER OF PROPOSAL DUE DATES\)](#)

[TABLE 3: SOLICITED RESEARCH PROGRAMS \(IN ORDER OF APPENDICES A–E\)](#)

[Table 2](#) and [Table 3](#) of this NRA are posted as separate documents on the web and can be reached either by following the hypertext links above embedded in the electronic version of this document or by going to <http://solicitation.nasaprs.com/ROSES2016> or to <http://solicitation.nasaprs.com/open> and selecting "NNH16ZDA001N".