

NNH12ZDA0060
SECOND STAND ALONE MISSIONS OF OPPORTUNITY NOTICE (SALMON-2)
NNH12ZDA0060-APEXMO2
PROGRAM ELEMENT APPENDIX (PEA) N:
ASTROPHYSICS EXPLORER MISSION OF OPPORTUNITY

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1 BACKGROUND

1.1 Programmatic Overview

The National Aeronautics and Space Administration (NASA) issues this Second Stand Alone Missions of Opportunity Notice (SALMON-2) Program Element Appendix (PEA) for the purpose of soliciting proposals for Astrophysics Mission of Opportunity (MO) science investigations to be implemented through its Explorers Program.

Three Mission of Opportunity types may be proposed in response to this PEA: (1) Partner Missions of Opportunity (PMOs), (2) New Missions using Existing Spacecraft (NMESs), and (3) Small Complete Missions (SCMs). SCMs include investigations on the International Space Station (ISS), suborbital-class missions (investigations requiring flight on high-altitude scientific balloon platforms, on suborbital Reusable Launch Vehicles (sRLVs), or using CubeSats – see Section 4.4.1 and Requirement N-6), investigations launched as secondary payloads, or investigations launched as hosted payloads. A fourth type of investigation, U.S. Participating Investigators (USPIs), may be proposed in response to Appendix D.12, Astrophysics Explorer U.S. Participating Investigators, of the NASA Research Announcement, Research Opportunities in Space and Earth Sciences 2014 (ROSES-2014), which is being released simultaneously with this PEA.

Investigations may target any astrophysics scientific investigation that advances the objectives outlined in Section 2.1 of this PEA. Investigations that address NASA goals in other areas, such as heliophysics, Earth science, or planetary science, are not solicited.

1.2 Explorers Program Background

The Explorers Program is the oldest continuous program in NASA. It is comprised of a longstanding series of space science missions that are independent, but share a common funding and NASA oversight/insight management structure. Initiated with the Explorer 1 launch in 1958 and including the Nobel Prize recognized Cosmic Background Explorer (COBE) mission, the Explorers Program has launched over 90 missions.

Though historically not always this way, the program currently administers only Principal Investigator (PI)-led science investigations for the Heliophysics and Astrophysics Divisions of NASA's Science Mission Directorate (SMD). Competitive selection by peer review ensures that the best and most current science affordable within the cost cap will be accomplished.

Since the early 1990s, the Explorers Program has provided several types of flight opportunities for addressing astrophysics science objectives. These mission types are defined by their cost caps

and are designed to increase the number of flight opportunities in response to recommendations from the scientific community. The Explorers Program currently consists of two types: larger stand-alone “full missions,” for which NASA offers a dedicated launch vehicle, and smaller investigations called “missions of opportunity.”

An Explorer MO is an investigation generally characterized by being part of a host space mission other than a strategic SMD mission, or by being a small complete mission with its own identified access to space, or by being a new science investigation utilizing an existing operating spacecraft that has completed its prime mission. For each Explorer AO, full mission or MO, the budget available varies, as do the types of investigations that may be proposed.

Explorer MOs are solicited through the SALMON-2 AO (NNH12ZDA006O) by amending it with a specific Program Element Appendix. This solicitation for Astrophysics Explorer Mission of Opportunity is one such PEA.

1.3 Overview of this Program Element Appendix

The SALMON-2 AO is an omnibus solicitation that provides the overall structure, guidelines and requirements for several types of MO solicitations. Each new opportunity is announced through a PEA that details the solicitation and may include additional guidelines and requirements. This document is one such PEA. The SALMON-2 AO (NNH12ZDA006O) can be found in the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) at <http://nspires.nasaprs.com/> or at <http://go.nasa.gov/SALMON2-AO>.

NASA issues this PEA as an appendix of the SALMON-2 AO for the purpose of soliciting proposals for Astrophysics Explorer MO investigations to be managed under the NASA Explorers Program. All investigations proposed in response to this solicitation must support NASA’s astrophysics science goals (Section 2.1 of this PEA) and the goals and objectives of the Explorers Program (Section 2.2 of this PEA), must be implemented by Principal Investigator (PI)-led investigation teams (Sections 4.2.4 and 5.4.1 of the SALMON-2 AO), and must result in the provision of complete space investigations (Section 5.3.2 of the SALMON-2 AO).

Proposals submitted in response to this PEA will be selected for flight nominally through a two-step competitive process. Proposals submitted in response to this PEA will undergo the first step evaluation. As the outcome of the first step evaluation, NASA intends to fund one or more MO investigations to proceed to an 11 month Phase A concept study. In the second step, NASA will conduct an evaluation of the Phase A concept study reports. From this evaluation, NASA expects to select up to two MOs to proceed into Phase B and subsequent mission phases.

The SALMON-2 AO and this PEA, particularly Section 4, present the requirements and constraints that apply to proposals that are to be submitted. Appendix B of the SALMON-2 AO contains additional requirements on the format and content of the proposals. Documents available through the Astrophysics Explorer Mission of Opportunity Program Library at <http://explorers.larc.nasa.gov/APSMEX/MO/programlibrary.html> (hereafter referred to as the Program Library) are intended to provide guidance for investigations selected; they are specifically not intended to impose requirements on proposals.

1.4 NASA Online Document Information System

NASA Policy Directives (NPD) and NASA Procedural Requirements (NPR) documents are available through the NASA On-line Document Information System (NODIS) at <http://nodis3.gsfc.nasa.gov/>.

2 SCIENCE AND PROGRAM OBJECTIVES

2.1 NASA Astrophysics Science Objective and Goals

One of NASA's strategic objectives is to discover how the universe works, explore how it began and evolved, and search for life on planets around other stars. Further information on NASA's strategic goals may be found in NASA Policy Directive (NPD) 1001.0B, *NASA 2014 Strategic Plan*, available through the Program Library (Appendix D).

NASA SMD addresses this strategic objective by conducting astrophysics investigations designed to address the following science goals:

- Probe the origin and destiny of our universe, including the nature of black holes, dark energy, dark matter and gravity;
- Explore the origin and evolution of the galaxies, stars and planets that make up our universe;
- Discover and study planets around other stars, and explore whether they could harbor life.

Further information on the goals and objectives of NASA's Astrophysics programs may be found in the *NASA 2014 Science Plan* and in *Enduring Quests Daring Visions, NASA Astrophysics in the Next Three Decades*, available through the Program Library.

2.2 Explorers Program Goals and Objectives

The goal of NASA's Explorers Program is to provide frequent flight opportunities for high quality, high value, focused astrophysics science investigations that can be accomplished under a not-to-exceed cost cap and that can be developed relatively quickly, generally in 36 months or less, and executed on-orbit in less than three years.

The Explorers Program accomplishes these world-class space science investigations utilizing efficient management approaches to contain mission cost through commitment to, and control of, design, development, and operations costs. The Program also seeks to enhance public awareness of and appreciation for space science by incorporating educational and public outreach activities as integral parts of the investigations.

The Explorers Program provides an effective means of timely achievement of strategic goals. By conducting a rapid series of science investigations, NASA is responsive to new knowledge, technology, and science priorities. Pressing questions in astrophysics science are addressed, permitting a steady improvement in our understanding of astronomical systems and the processes that affect them. The frequent, steady nature of the investigations ensures a continuing stream of fresh scientific data to the broader science community, thus maintaining the excellence of the U.S. space science program and the inspiration of a new generation of investigators.

The Explorers Program strives to:

- advance scientific knowledge of astrophysics processes and systems;
- add scientific data and other knowledge-based products to data archives for all scientists to access;
- lead to scientific progress and the publishing of results in the peer-reviewed literature to encourage, to the maximum extent possible, the fullest commercial use of the knowledge gained;
- implement technology advancements prepared in related programs; and
- announce scientific progress and results in popular media, scholastic curricula, and materials that can be used to inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.

2.3 NASA Management of the Explorers Program

The selected investigation(s) will be managed by the Explorers Program. The Associate Administrator for SMD has established the Explorers Program Office at the NASA Goddard Space Flight Center (GSFC) to be responsible for project oversight. The Explorers Program Manager at NASA GSFC reports to the Astrophysics Division Deputy Director at NASA Headquarters. Additional details about the program office staffing, structure, and goals can be found in the *Explorers Program Plan*, available through the Program Library. There are appropriate protective firewalls between the Explorers Program Office and the rest of NASA GSFC, allowing investigators from GSFC to propose in response to this PEA. The Explorers Program Office will manage the Astrophysics Explorer Mission of Opportunity investigations under the requirements of NPR 7120.5E, *NASA Space Flight Program and Project Management Requirements*, as described in Section 4.1.2 of the SALMON-2 AO. Safety, reliability, and mission assurance requirements for Astrophysics Explorer Mission of Opportunity investigations will be consistent with the *Standard Mission Assurance Requirements* document found in the Program Library.

All references to NPR 7120.5D NID in SALMON-2 should be interpreted as referencing NPR 7120.5E.

3 PROPOSAL OPPORTUNITY PERIOD AND SCHEDULE

The following schedule applies to this PEA.

- A Preproposal Workshop will take place in association with this solicitation. Further information will be available at the Astrophysics Explorer Mission of Opportunity Acquisition website (<http://explorers.larc.nasa.gov/APSMEX/MO/index.html>) prior to the Preproposal Workshop.
- Questions concerning any portion of this PEA should be addressed to the Point of Contact given in Section 7 of this PEA. The period for questions will close two weeks before the proposal due date.
- A Notice of Intent (NOI) to propose to this announcement is extremely valuable to NASA for purposes of planning the proposal evaluation and peer reviews, and, therefore, is strongly encouraged. NOIs are due no later than 11:59 p.m. Eastern Time on the date given in Section 7 of this PEA. Section 6.1.2 of the SALMON-2 AO provides information on electronic NOI submission through NSPIRES.

- All proposals are due no later than 11:59 p.m. Eastern Time on the date given in Section 7 of this PEA. Proposals must be fully electronic and must be submitted through NSPIRES. Proposal submission requirements are outlined in Section 5 of this PEA.
- Evaluation and selection for flight will be done using a two-step selection process.
- NASA funded Phase A activities will be conducted by the investigation team(s) selected as a result of the first step of this solicitation.
- NASA funding for selected proposals will begin as soon as appropriate funding vehicles can be put in place, usually within four weeks following receipt of the Statement of Work, as set forth in Section 6.3.2 of this PEA.

4 REQUIREMENTS AND CONSTRAINTS

4.1 Eligibility to Participate in this Proposal Opportunity

Refer to Section 4.2 of the SALMON-2 AO for the policies on participation policy. For this particular PEA, NASA will place full or partial limitations (as described in the SALMON-2 AO) on organizations that will be involved in the evaluation process. Cornell Technical Services LLC is subject to the “Full Limitation” as described in Section 4.2.1 of the SALMON-2 AO. There is no limitation on the Aerospace Corporation.

4.2 Types of Mission of Opportunity

Three Mission of Opportunity types may be proposed in response to this solicitation: (1) Partner Missions of Opportunity (PMOs), (2) New Missions using Existing Spacecraft (NMESs), and (3) Small Complete Missions (SCMs). SCMs include investigations on the International Space Station (ISS), suborbital-class missions (investigations requiring flight on high-altitude scientific balloon platforms, on suborbital Reusable Launch Vehicles (sRLVs), or using CubeSats), investigations launched as secondary payloads, or investigations launched as hosted payloads. See Section 5.1 of the SALMON-2 AO for complete descriptions of these types of MOs as well as constraints and requirements for proposals.

A fourth type of investigation, U.S. Participating Investigators (USPIs), may be proposed in response to ROSES-14 Appendix D.12. A USPI proposes to participate as a Co-I for an instrument, experiment, or technology demonstration that is being built and flown by a sponsor agency other than NASA. NASA has released simultaneously with this PEA a solicitation for Astrophysics Explorer U.S. Participating Investigators through the ROSES-2014 NASA Research Announcement (NRA) (NNH14ZDA001N). The Explorer USPI program element appendix of the ROSES NRA is available at <http://nspires.nasaprs.com/> or at <http://go.nasa.gov/ROSES14>. USPI proposals submitted to that solicitation will be due at the same time as the Astrophysics Explorer MOs. USPI NOIs and proposals will be submitted in response to the ROSES-2014 amendment, will be subject to the proposal guidelines specified in ROSES-2014, will be subject to the constraints (cost, schedule, technical) and requirements specified in ROSES-2014, and will be reviewed and selected using the proposal criteria specified in ROSES-2014.

4.3 Science Requirements and Constraints

The science objectives are described in Section 2 of this PEA. Any appropriate science question relevant to NASA's astrophysics objectives and goals may be addressed with the proposed investigations. Section 2 of this PEA provides the basis for the evaluation of intrinsic science merit as described in Section 7.2.2 of the SALMON-2 AO. Investigations addressing areas of science outside astrophysics science objectives, as described in Section 2 of this PEA, are not solicited.

Requirement N-1. Proposals shall address appropriate science questions relevant to the NASA astrophysics science objectives and goals described in Section 2 of this PEA.

Requirements for documentation in the proposal of the flow-down of requirements from the proposed science goals and objectives are described in Section 5.2.2 of the SALMON-2 AO.

Requirement N-2. Each proposal shall clearly define its science question or questions, shall demonstrate how the science questions map into high-level science requirements, and shall show how the science requirements subsequently map into measurement, data, instrument, and mission requirements.

Baseline and threshold investigations are defined in Section 5.2.4 of the SALMON-2 AO.

Requirement N-3. Each proposal shall clearly state the baseline and threshold requirements for the mission and the baseline and threshold mission lifetime.

NASA expects each proposal to fully describe the requirements for calibration and validation of the instruments and the data returned. Other data policies and requirements are given in Section 4.4 of the SALMON-2 AO and Section 4.5.6 of this PEA.

Requirement N-4. Each proposal shall fully describe the requirements for calibration and validation of the instruments and the data returned.

4.4 Cost and Schedule Requirements and Constraints

4.4.1 Cost Requirements and Constraints

The PI-Managed Mission Cost is defined in Section 4.3.1 of the SALMON-2 AO. Except for suborbital-class missions (high-altitude scientific balloon missions, missions on sRLVs, and CubeSats), the PI-managed Mission Cost cap for an Astrophysics Explorer Mission of Opportunity, including all mission phases and the cost of accommodation on and/or delivery to the host mission, if applicable, is \$65 million in Fiscal Year (FY) 2015 dollars. The PI-managed Mission Cost cap is \$35 million in FY 2015 dollars for suborbital-class missions.

NASA expects to select one or two Astrophysics Explorer Missions of Opportunity. If multiple selectable missions are proposed with combined costs within the available funding, anticipated to be approximately \$65 million, NASA may select more than one proposed investigation.

Requirement N-5. Proposals shall be for complete investigations including Phases A-F.

Requirement N-6. The proposed PI-Managed Mission Cost for the Astrophysics Explorer Missions of Opportunity shall be no more than \$65 million in FY 2015 dollars, except for suborbital-class missions (defined as (a) high-altitude scientific balloon missions, (b) missions on sRLVs, and (c) CubeSats), for which it shall be no more than \$35 million in FY 2015 dollars.

Requirement N-7. Proposals shall include detailed plans and budgets for Phases A-F for costs that are within the PI-Managed Mission Cost.

4.4.2 Schedule Requirements and Constraints

For Partner MOs, the proposing PI must provide evidence that the sponsoring organization intends to fund the primary host mission and that the NASA commitment for U.S. participation is required by the sponsoring organization prior to December 31, 2018. The launch date itself for a Partner MO is not constrained.

For Small Complete Mission (SCM) MOs, proposers must specify the launch date in the proposal, which is to be no later than December 31, 2020. Explorer SCM MO investigations with an anticipated launch date requirement later than the end of calendar year 2020 should be proposed in response to a subsequent opportunity.

Proposers should be aware that it may be necessary for NASA to adjust the launch date and definition phasing of selected investigations from that proposed in order to conform to the available Explorers Program budget profile and/or NASA's ability to negotiate a launch opportunity to the International Space Station, for a high-altitude scientific balloon mission, for launch opportunities on reusable launch vehicles, or for CubeSat launches; therefore, the degree of launch date flexibility must be indicated in the proposal.

It is intended that proposed investigations be evaluated and selected through a two-step competitive process. Step 1 is the solicitation, submission, evaluation, and selection of proposals prepared in response to this PEA. The Step 1 evaluation and selection process is described in section 7 of the SALMON-2 AO. As the outcome of Step 1, one or more Step 1 proposals may be selected for Phase A study and evaluation if their perceived value to the Explorers Program is significant. NASA will issue awards (provide funding to NASA Centers and the Jet Propulsion Laboratory (JPL), award contracts to non-NASA institutions, or utilize other funding mechanisms, as applicable) to the selected proposers to conduct Phase A concept studies and submit Concept Study Reports to NASA. Step 2 is the preparation, submission, evaluation, and continuation decision (downselection) of the Concept Study Reports. As the outcome of Step 2, NASA may continue one or more investigations into the subsequent phases of mission development for flight and operations.

Proposers selected through this AO will be awarded a contract to conduct a Phase A concept study with duration of approximately 11 months and capped at \$250,000 Real Year (RY) dollars.

A proposal may be selected for development without first completing a Phase A concept study. The proposal must make the case that it is not only necessary, but also that it is also technically feasible for the project to be selected for development without a competitive Phase A concept study. The proposer must recognize that NASA would only make such a decision without a Phase A competition if the MO proposal were especially compelling.

Requirement N-8. Proposals shall include a detailed development schedule (including integration plans) and an associated planning budget that for a SCM secures the launch before December 31, 2020, or for PMOs and NMESs is consistent with the documented launch and operations schedule of the primary host mission.

4.4.3 Access to Space Cost Requirements

The following classes of platforms are provided by NASA for access to space, or near space, at no cost to the PI-managed Mission Cost (see Section 4.5.3 of this PEA for additional information).

- Access to space will be provided by NASA for missions on the International Space Station (ISS).
- NASA will provide balloon vehicles and balloon launch services for missions on high-altitude scientific balloons.
- Platforms are provided by NASA to host payloads on sRLVs.
- NASA will provide launch and deployment services for missions on CubeSats.

For all other proposals, including small complete missions launched as secondary or hosted payloads, any costs for access to space must be included in the PI-managed Mission Cost.

Requirement N-9. With the exception of small complete missions to the International Space Station or suborbital-class missions, any costs for access to space must be included in the PI-managed Mission Cost.

4.4.4 Full Cost Accounting for NASA Facilities and Personnel

This Section supersedes Section 5.5.5 of the SALMON-2 AO.

For the purpose of calculating the full cost of NASA-provided services, proposal budgets from NASA Centers, whether as the proposing organization or as a supporting organization, are to include within the PI-Managed Mission Cost all costs normally funded by an SMD Project under NASA's full cost accounting practices, including civil servant labor (salaries and benefits), civil service travel, and procurements. All of these costs must be clearly identified by year within the budget justification section of the proposal.

Estimated NASA Center Management and Operations (CM&O) overhead costs must also be included within the cost cap, to enable a level playing field for all proposers. Per HQ policy guidance signed in June 2010 by the Associate Administrator, Mission Support Directorate and by the Agency Chief Financial Officer, all Centers shall use an identical CM&O burden rate of \$43K (RY) per "equivalent head." For years after FY2015, this number must be inflated. Per Agency policy, this rate must be applied as a "cost per equivalent head" to all Civil Service FTEs plus on/near site contractor WYEs associated with the proposal. The estimated FTEs and WYEs

per fiscal year, and the resulting CM&O burden, must be identified in a separate table within the budget justification section of the proposal.

The CM&O burden costs must be clearly denoted in all budget tables. These costs may not be included or rolled into any other budget lines in such a way that they become unidentifiable.

Do not include within the cost proposal, or within the PI-Managed Mission Cost, any estimate for Agency Management and Operations (AM&O, a.k.a. NASA Headquarters overhead).

Table 1: Cost Elements for NASA Center Budget Proposals in response to SMD AOs

	Identify in proposal?	Include in PI-managed mission cost?	Funding source	Comments
Civil Service Labor	Yes	Yes	SMD Program	Includes salaries and benefits
Civil Service Travel	Yes	Yes	SMD Program	
Other Direct/Procurements	Yes	Yes	SMD Program	Includes procurements as typically identified by flight projects in the NASA N2 budget database
CM&O	Yes	Yes	CASP	Applied to NASA provided labor, including Center civil servants and on-site contractors
AM&O	No	No	CASP	
NASA Contributed Costs	Yes	No	Identify	Must be non-SMD
Non-NASA Federal Government (funding requested from NASA)	Yes	Yes	SMD Program	If NASA funding is requested for the non-NASA Federal Government agency
Contributions	Yes	No	Identify	Includes all non-NASA contributions

Requirement N-10. Proposals including costs for NASA Centers shall conform to the full cost policy stated in this Section. Each of the elements of the NASA Center costs (direct labor, travel, procurements) shall be separately identified by year.

If any NASA funded item(s) or services are to be considered as contributed costs, then the contributed item(s) must be separately funded by a non-SMD effort complementary to the proposed investigation, the value of the contribution(s) must be estimated, and the funding source(s) must be identified.

Requirement N-11. If any NASA funded item(s) or services are considered as contributed costs, then the proposal shall estimate the value of the contribution(s) and shall identify the funding source(s).

Any non-NASA Federal Government costs must follow the appropriate agency accounting standards for full cost. If no standards are in effect, the proposers must follow the *Managerial Cost Accounting Concepts and Standards for the Federal Government*, as recommended by the Federal Accounting Standards Advisory Board and available in the Program Library.

Proposals including costs for non-NASA Federal Government agencies shall follow the applicable accounting standards.

4.5 Technical Requirements and Constraints

4.5.1 New Technologies/Advanced Engineering Development

This Section intends to clarify the requirement for New Technologies and/or Advanced Engineering Developments and supersedes Section 5.3.4 of the SALMON-2 AO.

This PEA solicits PMOs, NMESs, and SCMs for flight missions, not technology or advanced engineering development projects. Proposed investigations are generally expected to have mature technologies, with systems at a Technology Readiness Level (TRL) of 6 or higher. For the purpose of TRL assessment, systems are defined as level 3 WBS payload developments (i.e., individual instruments) and level 3 WBS spacecraft elements (e.g., electrical power system); see Figure 3-7 of the *NASA WBS Handbook*, NASA/SP-2010-3404, which can be found in the Program Library. TRLs are defined in NPR 7123.1B *NASA Systems Engineering Processes and Requirements*, Appendix E, which can be found in the Program Library.

Proposals with a limited number of less mature technologies and/or advanced engineering developments are permitted as long as they contain a plan for maturing systems to TRL 6 (see NASA/SP-2007-6105 Rev 1, *NASA Systems Engineering Handbook*) by no later than Preliminary Design Review (PDR) and adequate backup plans that will provide mitigation in the event that the systems cannot be matured as planned. The TRL state of systems will be validated by an independent team at PDR.

Requirement N-12. Proposals that use systems currently at less than TRL 6 shall include a plan for system maturation to TRL 6 by no later than PDR and a backup plan in the event that the proposed systems cannot be matured as planned (see Section 5.1 of this PEA, for additional detail).

4.5.2 Additional Requirements for Partner Mission of Opportunity Investigations

The following requirements are in addition to those given in Section 5.1.1 of the SALMON-2 AO.

Requirement N-13. In addition to the requirements given in the SALMON-2 AO, all proposed PMO investigations must also demonstrate: (1) their formal relationship with the sponsoring agency's host mission (e.g., already selected contribution, invited

contribution, or proposed contribution); and (2) the status of the host mission within the sponsoring agency (i.e., Pre-Phase A, Phase A, or Phase B), including the level of commitment that the sponsoring agency has made to complete the mission.

Requirement N-14. In addition to the requirements given in the SALMON-2 AO, all proposed PMO investigations requiring flight on the ISS must also provide a Letter of Acknowledgement from the NASA Space Station Payload Office. This Letter of Acknowledgement must contain: (1) a description of the formal relationship with the sponsoring agency's host mission for access and accommodation at the space station, (2) identification of known challenges and/or conditional provisions for access or accommodation of the host mission, and (3) a description of the level of technical interchange and negotiation required to mature the host mission's provisions for access and accommodation.

PMOs may be proposed for participation in nonstrategic NASA missions. A PMO may be proposed for participation in a PI-led NASA mission from a program other than Explorer (an Explorer MO may not be proposed for an Explorer mission).

Requirement N-15. A proposal for a PMO hosted by a PI-led mission from a program other than the Explorers Program must satisfy the following requirements: (1) The proposal must include a Letter of Commitment from the PI of the host mission endorsing the partnership and (2) the feasibility assessment of the host mission, i.e., the technical, management, and cost (TMC) evaluation in Step 1 and Step 2, must include the accommodations for the proposed PMO instrument.

4.5.3 Additional Requirements for Small Complete Mission of Opportunity Investigations

The following requirements are in addition to those given in Section 5.1.3 of the SALMON-2 AO.

Requirement N-16. In addition to the requirements given in the SALMON-2 AO, all proposed SCM investigations, with the exception of investigations requiring flight on the ISS or suborbital-class missions, must also provide a Letter of Commitment from the program or agency providing access to space. This Letter of Commitment must contain: (1) a detailed description of the proposed provisions for access to space (e. g., launch to orbit provided by industrial or non-U.S. partner, secondary ride on another U.S. sponsored mission, etc.), and (2) the status of those proposed flight provisions within the sponsoring program or agency (i.e., conditional, confirmed, conceptual, etc.) including the level of commitment that the sponsoring program/agency has made to support that flight opportunity.

4.5.3.1 Investigations Hosted on the ISS

SCMs may be proposed for the ISS. Investigations requiring flight on the ISS must provide a Letter of Feasibility from the NASA Space Station Payloads Office.

Requirement N-17. In addition to the requirements given in the SALMON-2 AO, all SCM investigations requiring flight on the ISS must also provide a Letter of Feasibility from

the NASA Space Station Payload Office demonstrating that the proposed payload to be flown aboard the ISS can meet the access and accommodation requirements for ISS payloads. This Letter of Feasibility must contain: (1) a preliminary assessment of the feasibility of proposed provisions for access to and accommodation on the ISS, (2) identification of known challenges and/or conditional provisions for access or accommodation, and (3) a description of the level of technical interchange and negotiation required to mature the proposed provisions for access and accommodation.

Proposers requiring an ISS Letter of Feasibility should contact:

Sharon C. Conover
ISS Research Integration Office/Mail Stop OZ
Johnson Space Center
National Aeronautics and Space Administration
Houston, TX 77058
Telephone: 281-244-8518
E-mail: sharon.c.conover@nasa.gov

Additional information is found through the International Space Station Capabilities and Payload Accommodations Document link in the Program Library. For any selected investigations, flight commitment to the ISS will be negotiated with NASA's Human Exploration and Operations Mission Directorate during Phase A. Selection of any investigation to be flown aboard the ISS is conditional until negotiations for ISS access and accommodation are successfully completed.

An Astrophysics Explorer MO investigation that is a SCM to the International Space Station should plan to complete its primary mission investigations by the end of FY 2024. NASA currently plans to operate ISS thru FY 2024, and while the agency is taking no action that would preclude operation beyond FY 2024, no commitment has yet been made either way.

4.5.3.2 Investigations on High-Altitude Scientific Balloons

SCMs may be proposed for flight on high-altitude scientific balloons. SCMs on high-altitude scientific balloons must be proposed for flight on Long Duration Balloons (LDBs) or Ultra Long Duration Balloons (ULDBs).

Requirement N-18. Proposals for SCM investigations on high-altitude scientific balloons must be proposed for flight on Long Duration Balloons (LDBs) or Ultra Long Duration Balloons (ULDBs).

Investigations requiring flight on LDBs or ULDBs must provide a Letter of Feasibility from the NASA Balloon Program Office.

Requirement N-19. In addition to the requirements given in the SALMON-2 AO, all SCM investigations requiring flight on high-altitude scientific balloons must also provide a Letter of Feasibility from the NASA Balloon Program Office demonstrating that the proposed payload to be flown aboard LDBs or ULDBs can meet the access and accommodation requirements for balloon payloads. This Letter of Feasibility must contain: (1) a preliminary assessment of the feasibility of proposed provisions for access

to and accommodation on LDBs or ULDBs, (2) identification of known challenges and/or conditional provisions for access or accommodation, and (3) a description of the level of technical interchange and negotiation required to mature the proposed provisions for access and accommodation.

Proposers requiring a NASA Balloon Program Office Letter of Feasibility should contact
Debora Fairbrother
National Aeronautics and Space Administration
Balloon Program Office/Code 820
Wallops Flight Facility
Wallops Island, VA 23337
Telephone: 757-824-1453
E-mail: debora.a.fairbrother@nasa.gov

Additional information is found through the *Scientific Balloon Missions of Opportunity* document link in the Program Library. For any selected investigations, flight commitment to LDBs or ULDBs will be negotiated with the NASA Balloon Program Office during Phase A. Selection of any investigation to be flown aboard LDBs or ULDBs is conditional until negotiations for access and accommodation are successfully completed.

4.5.3.3 *Investigations Hosted on CubeSats*

SCMs may be proposed for flight on CubeSats. NASA provides launch opportunities for CubeSats as secondary payloads on U.S. Government missions. The CubeSat Launch Initiative is managed by the NASA Human Exploration and Operations Mission Directorate. See http://www.nasa.gov/directorates/heo/home/CubeSats_initiative.html.

For CubeSat proposals, all instruments/small satellites are recommended to comply with Cal Poly CubeSat Developer's specifications, found at <http://cubesat.calpoly.edu/index.php/documents/developers>. Concepts that do not comply with the Cal Poly CubeSat and Poly Picosat Orbital Deployer (P-POD) standards should clearly describe how their designs are packaged and deployed. NASA Launch Services Program has issued a *Program Level Dispenser and CubeSat Requirements Document* with requirements for CubeSats sized up to 6U (2U x 3U). All proposals for CubeSats sized up to 6U shall be compliant with these requirements. Both of these documents can also be found in the Program Library. No CubeSat form factors larger than 6U will be considered under the present call. Qualifying CubeSat form factors (size) include 1U, 1.5U, 2U, 3U and 6U with a mass not to exceed 1.33 kg per U.

Requirement N-20. All proposals involving sizes 1U through 6U CubeSats shall be compliant with the requirements in the NASA Launch Services Program *Program Level Dispenser and CubeSat Requirements Document*. No CubeSat form factors larger than 6U will be considered under the present call. Qualifying CubeSat form factors (size) include 1U, 1.5U, 2U, 3U and 6U with a mass not to exceed 1.33 kg per U.

For further information, please contact:

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

or

Jason C Crusan,
Director, Advanced Exploration Systems
Phone: 202-358-0635,
E-mail: jason.crusan@nasa.gov

4.5.3.4 *Investigations on suborbital Reusable Launch Vehicles*

SCMs may be proposed for flight on suborbital Reusable Launch Vehicles (sRLVs). Access to sRLV platforms is managed by the Flight Opportunities Program within the Space Technology Mission Directorate. Information about sRLVs is available from the Flight Opportunities Program website at <http://flightopportunities.nasa.gov>. Additional information on sRLV vehicles, including general vehicle capabilities and contact information for some vendors, is available at <http://flightopportunities.nasa.gov/platforms>. The Flight Opportunities Program may advise proposers on the use of sRLV platforms, including the potential integration, safety and mission assurance, and operational costs. Proposers interested in using sRLVs must identify a vehicle that can provide the technical capabilities required to conduct the proposed investigation. SCMs to be flown on sRLVs must either be automated or remotely operated. Remote operation capability must be confirmed with the flight operator.

Requirement N-21. 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) 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. Note that the Flight Opportunities Program is available to assist with (i) – (iii).

Questions concerning potential sRLV investigations may be addressed to:

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

4.5.4 Risk Classification

This opportunity solicits proposals for science investigations requiring the development and operation of space-based investigations. The projects are designated as Category 3 as defined in NPR 7120.5E, *NASA Space Flight Program and Project Management Requirements*. The payloads are designated as Class D as defined in NPR 8705.4, Risk Classification for NASA Payloads, except for PMOs, which depend on host mission's risk classification requirements.

Requirement N-22. If any requirements to the proposed hardware that are more stringent than Class D (as appropriate) are needed, they must be clearly described in the proposal.

4.5.5 End-of-Mission Spacecraft Disposal

Section 5.3.10 of the SALMON-2 AO discusses the requirements related to end-of-mission spacecraft disposal for PMOs and hosted payloads where the PI is not responsible for the host mission. For these proposals, information shall be included regarding the plan for instrument passivation at the end of operations or in preparation for end-of-mission disposal. In addition, information shall be provided identifying instrument system components expected to survive Earth reentry if this is the postmission disposal method. This will allow NASA to remain in compliance with NPR 8715.6A, NASA Procedural Requirements for Limiting Orbital Debris, and NASA-STD-8719.14A, Process for Limiting Orbital Debris.

Requirement N-23. Proposals shall describe the instrument passivation plan at end of mission. In addition, proposals shall identify instrument components anticipated to survive Earth reentry if this is the disposal method. This supersedes Requirement 39 in the SALMON-2 AO.

4.5.6 Science Data Policy

4.5.6.1 Data Analysis

The PI will be responsible for analysis of the investigation data necessary to complete the proposed science objectives, for archiving the data in the relevant NASA astrophysics data archive for public use, and for timely publication of initial scientific results in refereed scientific journals, as part of their mission operations (Phase E) or postmission (Phase F) activities. Proposals must allocate sufficient resources for this data analysis and archiving. Science studies with the archived data sets beyond the PI-led teams proposed science investigation will be solicited and selected by NASA in subsequent NASA solicitations through ROSES NRAs.

Requirement N-24. Proposals shall clearly identify the standard products from the investigation and describe the complete data processing flow leading to archived data products, including the time required to complete the initial and final on-orbit calibration and validation of the measurements. In accordance with the SMD requirement for open data and related software, any specialized software and algorithms required for basic data analysis and processing will be made available by the PI to the science community and public.

Requirement N-25. Proposals shall clearly present a plan for analysis of the mission data leading to completion of the proposed science investigation and achieving the identified

investigation goals and objectives. Proposals shall show that adequate resources, including funding, schedule, and personnel, are identified to complete the proposed science investigation.

4.5.6.2 *Data Rights*

By NASA policy, all science data returned from NASA investigations led by a NASA-funded PI are made available immediately in the public domain. Following a postflight checkout period, all data will be made available to the user community. There shall be no period of exclusive access. The principal investigator will propose the data product latency period for standard products listed in the proposal, and a justification for it must be demonstrated. Barring exceptional circumstances, data product latency may not exceed six months.

Requirement N-26. Proposals shall include a clear commitment to minimizing the latency for data products. Proposals shall specify the minimum necessary data latency period and shall provide a justification for that data latency period.

4.5.6.3 *Delivery of Data to Archive*

Mission data will be made fully available to the public by the investigator team in usable form, in the minimum time necessary and, in any case, within the proposed data latency period not to exceed six months following data receipt from the spacecraft. The PI will be responsible for collecting the scientific, engineering, and ancillary information necessary to validate and calibrate the data prior to making it fully available. By the investigation closeout, the investigation will deliver to the appropriate astrophysics data center all final data products, along with the scientific algorithm software, coefficients, ancillary data used to generate these products, and the algorithm and calibration documentation.

Archival data products will include low-level (raw) data, high-level (processed) data, and derived data products such as maps, ancillary data, calibration data (ground and in flight), documentation, related software, and/or other tools or parameters that are necessary to interpret the data. The PI will be responsible for generating data products that are documented, validated, and calibrated in physical units that are usable by the scientific community at large and provided within the proposed data latency period not to exceed six months following data receipt from the spacecraft.

NASA data archives have budgets to support core activities, including the basic ingestion and review of new data. Proposed mission data archiving plans and budgets must be consistent with the policies and practices of the appropriate NASA data archive.

Proposals may include funding for up to one year after end-of-operations for the generation and archiving of derived data products. This funding must be included in the capped PI-Managed Investigation Cost.

Requirement N-27. A schedule-based end-to-end data management plan, including approaches for data retrieval, validation, preliminary analysis, and archiving shall be described. The science products (*e.g.*, flight data, ancillary or calibration data, theoretical calculations, higher order analytical or data products, laboratory data, etc.) shall be

identified, including a list of the specific data products and the individual team members responsible for the data products. The plan shall identify the formats and standards to be used. It shall include an estimate of the raw data volume and a schedule for the submission to the data archive of raw and reduced data in physical units accessible to the science community.

4.5.6.4 *Sharing of Data from Partner Mission of Opportunity Investigations*

The data that are returned from Partner Mission of Opportunity investigations, at least from those aspects of the mission in which NASA is involved, shall be made available to the U.S. scientific community in a timely manner.

Requirement N-28. In addition to the requirements given in the SALMON-2 AO, all proposed PMO investigations must also provide: (1) a detailed description of the proposed provisions for sharing of science data, plans for returned scientific data, at least from those aspects of the mission in which NASA is involved, shall be made available to the U.S. scientific community in a timely manner, and the status of the host mission sponsoring agency's commitment to enter into an appropriate agreement with NASA for data sharing; and (2) a detailed explanation of how the U.S. astrophysics science community benefits from the proposed investigation.

4.6 SALMON-2 Required Specifications for PEAs

The SALMON-2 AO requires that PEAs make certain specifications.

- Section 2.4 of the SALMON-2 AO states that the PEA will specify the specific goals and objectives of the sponsoring Mission Directorate for that proposal opportunity. For this PEA, those goals and objectives are referenced in Section 2.
- Section 2.4 of the SALMON-2 AO states that the PEA will specify the funding available for selected investigations. For this PEA, the available funding is specified in Section 4.4.
- Section 3 of the SALMON-2 AO states that each PEA will specify a due date for proposals, as well as requirements and constraints for that specific solicitation, including the sponsoring NASA Headquarters (HQ) mission directorate and division, the type of MO, the cost cap, and any launch-by or commitment-by dates. For this PEA, the due date is specified in Section 7, requirements and constraints are specified in Section 4, the sponsoring mission directorate and division is specified in Section 1, the type of MO is specified in Section 4.2, the cost cap is specified in Section 4.4.1, and the schedule constraint is specified in Section 4.4.2.
- Section 4.1.2 of the SALMON-2 AO states that each PEA will specify the designated NASA Center for program office and any program-specific safety, reliability, and quality assurance document. For this PEA, the NASA Center for program office and the safety, reliability, and quality assurance document applicable to selected investigations are specified in Section 2.3.
- Section 4.1.4 of the SALMON-2 AO states that each PEA will specify the mission category and the payload risk classification that will be applied to selected investigations. For this PEA the payload risk classification is specified in Section 4.5.4.

- Section 4.2.1 of the SALMON-2 AO states that each PEA will specify whether there are any additional restrictions on participation by Aerospace in proposals. For this PEA, Section 4.1 states that there are no additional restrictions on participation by Aerospace in proposals.
- Sections 4.3.1, 4.3.2, and 4.3.3 of the SALMON-2 AO state that each PEA will specify additional costs to be included in, and any cap on, the PI-Managed Mission Cost, the Total Mission Cost, and the Enhanced Mission Cost. For this PEA, that information is specified in Section 4.4.1. Only the PI-Managed Mission Cost is capped.
- Section 4.3.4 of the SALMON-2 AO states that each PEA will specify any constraints on funding profile, selection date, and launch readiness date. For this PEA, those constraints are found in Sections 4.4.1 and 4.4.2.
- Section 4.6 of the SALMON-2 AO states that each PEA will identify any NASA-provided launch services. For this PEA, NASA plans for access to space are discussed in Section 4.4.3.
- Section 5.2.5 of the SALMON-2 AO describes Science Enhancement Options (SEOs) for proposed investigations. SEOs are permitted for proposals in response to the PEA, and any SEO proposal must meet the requirements in Section 5.2.5 of the SALMON-2 AO.
- Section 5.3.1 of the SALMON-2 AO states that each PEA will provide a determination as to whether a two-step competitive process will be used. This PEA states in Sections 1.3 and 3 that a two-step competitive process is being used.
- Section 5.3.4 of the SALMON-2 AO states that the PEA may specify that it solicits science or exploration investigations, not technology development projects. This PEA so states in Section 1.1.
- Section 5.7.1 of the SALMON-2 AO states that the PEA will specify whether an Education and Public Outreach program that is consistent with SMD policy is required. This PEA does not require an Education and Public Outreach program; therefore Requirements 69 and 70 of the SALMON-2 AO do not apply to this PEA. However, NASA may impose E/PO requirements during or subsequent to the Phase A concept study phase.
- Section 5.7.2 of the SALMON-2 AO states that the PEA may state that proposals may define a Student Collaboration (SC) that is a separate part of the proposed investigation. This PEA so states, and Requirements 71 and 72 of the SALMON-2 AO apply to this PEA.
- Section 5.8 of the SALMON-2 AO states that the PEA may specify unallowable sources of contributions. This PEA is sponsored by SMD and it does not permit contributions of funding from SMD programs other than the funding offered through this PEA.
- Section 7.1 of the SALMON-2 AO states that the PEA will identify the Selection Official. This PEA identifies the Selection Official in Section 6.2.

4.7 Exceptions to General SALMON-2 Requirements

This PEA contains the following exceptions to the SALMON-2 proposal preparation and submission requirements described in the SALMON-2 AO.

- Proposals or portions of proposals requesting NASA funding shall report proposal costs in FY 2015 dollars as well in Real Year (RY) dollars. The former is for determining compliance with the PI-Managed Mission Cost cap requirement. The latter is for NASA SMD budget planning. This instruction supersedes the request for costs only in RY dollars described in Appendix B of the SALMON-2 AO including Table B-3.

- Section 4.5.6 of this PEA provides data policies and requirements that supersede those in Section 4.4 of the SALMON-2 AO.
- Section 4.5.5 provides End-of Mission requirements that supersede those in Section 5.3.10 of the SALMON-2 AO.
- This PEA does not require an Education and Public Outreach program.

5 PROPOSAL PREPARATION AND SUBMISSION

5.1 Proposal Content Requirements

Requirement N-29. Proposal content must conform to the guidelines set forth in Appendix B of the SALMON-2 AO.

It is unnecessary to download the NSPIRES-generated 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 appropriate peer or NASA reviewers.

The key data associated with the electronic submission of proposals (see Section 6.2 of the SALMON-2 AO) includes questions indicating whether or not a proposal contains export-controlled information (see Sections 5.9.4 and 5.10.2 of the SALMON-2 AO). All proposers must answer these questions YES or NO when completing the electronic submission; these questions shall not be left unanswered.

All proposals must identify any export-controlled material in the proposal as instructed in Sections 5.9.4 and 5.10.2 of the SALMON-2 AO. To the extent possible, ITAR sensitive material should be organized into separate clearly marked sections.

Requirement N-30. All proposals must identify any export-controlled material in the proposal as instructed in Sections 5.9.4 and 5.10.2 of the SALMON-2 AO.

The following Requirement supersedes Requirement B-15 of the SALMON-2 AO. It clarifies the information requested on the traceability of the proposed investigation, e.g., instrument performance requirements. A modified template is available on the Explorer Astrophysics 2014 Library to assist proposers on presentation of the investigation traceability.

Requirement N-31. Traceability from science goals to measurement requirements to instrument functional and performance requirements and to top-level mission requirements shall be provided in tabular form and supported by narrative discussion. Instrument projected performance shall be compared to the instrument performance requirements.

The following Requirement supersedes Requirement B-23 of the SALMON-2 AO and clarifies the information requested on instrument resource margins.

Requirement N-32. Instrument Contingencies and Margins: This section shall summarize contingencies and margins of all instrument resources. It shall provide estimates of implementation design margins with respect to the required performance or allocations

for mass, power, data storage, telemetry, and any other resource requirements. Discuss the allocation of contingency and margin to the instrument and/or suite (see SALMON-2 AO for definitions of contingency and margin).

The following Requirement supersedes Requirement B-24 of the SALMON-2 AO and clarifies the information requested on instrument performance margins.

Requirement N-33. Performance Margins: For each instrument performance, this section shall provide estimates of performance margin with respect to the performance requirements as compared to projected performance estimates and shall justify that these performance margins are appropriate.

The following Requirement supersedes requirement B-27 of the SALMON-2 AO and clarifies the information requested on new technologies and/or advanced engineering development.

Requirement N-34. This section shall describe any proposed new technologies and/or advanced engineering developments and the approaches that will be taken to reduce associated risks. Descriptions shall address, at a minimum, the following topics:

- Identification and justification of the TRL for each proposed system (level 3 WBS payload developments and level 3 WBS spacecraft elements) incorporating new technology and/or advanced engineering development at the time the proposal is submitted (for *TRL definitions*, see NPR 7123.1B, *NASA Systems Engineering Processes and Requirements*, Appendix E, in the Program Library);
- Rationale for combining the TRL values of components and subsystems to derive each full system TRL as proposed, appropriately considering TRL states of integration (see NASA/SP-2007-6105 Rev 1, *NASA Systems Engineering Handbook*);
- Rationale for the stated TRL value of an element that is an adaptation of an existing element of known TRL;
- The approach for maturing each of the proposed systems to a minimum of TRL 6 by PDR:
 - Demonstration (testing) in a relevant environment can be accomplished at the system level or at lower level(s);
 - If applicable, justify what demonstration(s) in a relevant environment at lower level(s) (subsystem and/or subsystem-to-subsystem) would be sufficient to meet system level TRL 6, considering (i) where any new technology is to be inserted, (ii) the magnitude of engineering development to integrate elements, (iii) any inherent interdependencies between elements (e.g., critical alignments), and/or (iv) the complexity of interfaces – see the Program Library for examples;
 - Include discussion of simulations, prototyping, demonstration in a relevant environment, life testing, etc., as appropriate;
- An estimate of the resources (manpower, cost, and schedule) required to complete the technology and/or advanced engineering development; and
- Approaches to fallbacks/alternatives that exist and are planned, a description of the cost, decision date(s) for fallbacks/alternatives, relevant development schedules, and performance liens they impose on the baseline design, and the decision milestones for their implementation.

If no new technologies or advanced engineering development is required, system TRL 6 or above at the time of proposal submission shall be clearly demonstrated.

5.2 Proposal Submission Requirements

Requirement N-35. Proposals must be submitted electronically via NASA's master proposal data base system, the NASA Solicitation and Proposal Integrated Review and Evaluation System, at <http://nspires.nasaprs.com/>. This data site is secure and all information entered is strictly for NASA's use only.

Proposal submission instructions and requirements are provided in Section 6.2 of the SALMON-2 AO.

Requirement N-36. The proposal must be received no later than the time deadline on the proposal due date given in Section 7 of this PEA.

5.3 Questions

In order to make sure that all proposers receive the same information, all questions concerning the content provided in this PEA, or in the documents available through the Explorers Program Library, should be sent to the E-mail address for questions listed in Section 7 of this PEA. Responses that are helpful and informative to proposers will be posted on the website listed in Section 7 of this PEA.

The deadline for receipt of questions is two weeks before the proposal due date listed in Section 7 of this PEA.

6 PROPOSAL EVALUATION, SELECTION, AND IMPLEMENTATION

6.1 Scientific/Technical Evaluation Factors

Proposals will be evaluated according to the evaluation criteria set forth in Section 7.2 of the SALMON-2 AO.

6.2 Selection Process

After the review by the SMD AO Steering Committee, the evaluation results will be presented to the Associate Administrator for the Science Mission Directorate, who will make the final selection(s). As the Selection Official, the SMD Associate Administrator may consult with senior members of SMD and the Agency, including the Director of the Astrophysics Division, concerning the selections.

As stated in Section 7.3 of the SALMON-2 AO, the Selection Official may take into account a wide range of programmatic factors in deciding whether or not to select any proposals and in selecting among top-rated proposals, including, but not limited to, planning and policy considerations, available funding, programmatic merit and risk of any proposed partnerships, and maintaining a programmatic balance across the mission directorate(s).

6.3 Implementation Activities

Proposal selection and award will be implemented according to the guidelines set forth in Section 7.4 of the SALMON-2 AO with the following amendments.

6.3.1 Principal Investigator-led Team Masters Forum

One step toward successful execution of PI-led missions is to ensure that PI-led mission management teams receive the instruction necessary to enable them to better execute their missions for NASA. SMD, in conjunction with the NASA Academy of Program, Project, and Systems Engineering Leadership (APPEL), has established a 2.5 day PI-led Team Masters Forum for newly selected PI-led mission management teams. The purpose of the PI-led Team Masters Forum is to facilitate knowledge sharing in areas that are deemed necessary to successfully execute PI-led SMD science missions. Course attendance by the leaders of newly selected PI-led mission management teams (PI, Project Manager, Project Scientist, and Project Systems Engineer) and the NASA Headquarters Program Scientist and Program Executive (where assigned) is required as soon as practical after proposal selection.

6.3.2 Award Administration and Funding of Investigations

Oversight management responsibilities have been assigned to the Explorers Program Office at the NASA Goddard Space Flight Center. The Explorers Program Office will authorize the release of funding to each selected investigation. The initiation of the investigation's award of the contract will take place as soon as possible after notification of selection. In order for contracts to be awarded, Statements of Work (SOWs) and updated cost and pricing data are required. If more than one contractual arrangement between NASA and the proposing team is required, separate SOWs and updated cost and pricing data are required for each contractual arrangement. NASA Centers will receive funding via intra-agency funding mechanisms.

Proposals are not required to include SOWs and cost and pricing data. These will be required only for investigations that are selected for award. For those investigations that are selected, it will be in the best interest of the PI-led investigation management teams to provide SOWs, cost and pricing data, and small business subcontracting plans in as timely a manner as possible. The process of awarding contracts cannot begin until final SOWs, cost and pricing data, and small business subcontracting plans have been received, and funds cannot be provided to the implementing organizations until this process has been completed.

SOWs will be required for selected investigations, regardless of whether a proposing organization is Governmental or non-Governmental. SOWs will include the following as a minimum: Scope of Work, Deliverables (including science data), and Government Responsibilities (as applicable). For contracts that exceed \$700K, the contractor will be required to provide cost and pricing data to support the cost estimate and to certify the cost proposed for the contract in accordance with FAR 15.406-2. Selected proposers should contact the Explorers Program Office at NASA Goddard Space Flight Center at Tel: 301-286-8212 as soon as possible after award regarding all SOW requirements.

For each selection, and unless otherwise stated in the selection letter, the selected investigation's cost cap will be set at the proposal's proposed cost.

NASA Centers shall follow their standard operation procedure for selecting teaming partners to facilitate the rapid implementation of their proposal, if selected, and this shall be documented in Appendix 6 of the proposal (see Appendix B, Section J.6, of the SALMON-2 AO).

6.3.3 *International Agreements*

Should a non-U.S. proposal, or a U.S. proposal with non-U.S. participation, be selected by NASA, the Science Division of NASA's Office of International and Interagency Relations will arrange with the non-U.S. sponsoring agency for the proposed participation to go ahead on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging their respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail an exchange of letters between NASA and the sponsoring governmental agency or a formal Agency-to-Agency MOU. For additional policies and requirements, see Section 5.9 of the SALMON-2 AO.

7 SUMMARY OF KEY INFORMATION

Funding available	See Section 4.4.1 of this PEA
Community Announcement	November 2013
Release of Draft PEA Date	July 14, 2014
Comments Due on Draft PEA	August 4, 2014
Final PEA Release Date	September 17, 2014
Date for Preproposal Conference	October 7, 2014
Due Date for NOI (notice of intent to propose)	October 15, 2014
Due Date for Proposals	December 18, 2014
Selection Date for Competitive Phase A Studies	Summer 2015
Concept Study Reports Due	Summer 2016
Down-Selection Date	Early 2017
Web site for additional information for the Astrophysics Explorer MO PEA	http://explorers.larc.nasa.gov/APSMEX/MO/index.html
Program Library for the Astrophysics Explorer PEA	http://explorers.larc.nasa.gov/APSMEX/MO/program_library.html
Submission Medium	Electronic copies only; see Section 5.2 of this PEA
Web site for submission of electronic proposal via NSPIRES	http://nspires.nasaprs.com/ (help desk available at 202-479-9376 or nspires-help@nasaprs.com)

NASA point of contact	Dr. Wilton Sanders Astrophysics Explorers Program Scientist Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Tel: 202-358-1319 E-mail: wilton.t.sanders@nasa.gov
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