



2018 Heliophysics Mission of Opportunity (MO) Pre-Proposal Conference

Overview of the 2018 Heliophysics MO Solicitations

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Conference Goals

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NASA has released two solicitations for new investigations to achieve heliophysics science goals in the form of Program Element Appendices (PEAs) for NASA's Third Stand Alone Missions of Opportunity Notice (SALMON-3) NNH17ZDA004O:

- PEA L: 2018 Heliophysics Technology Demonstration (TechDemo) Mission of Opportunity
 - **NNH17ZDA004O-HPTDMO**
- PEA M: 2018 Heliophysics Science Mission of Opportunity
 - **NNH17ZDA004O-HPSMO**

Goals today are to:

- Provide an overview of the two PEAs
- Provide an overview of the evaluation, categorization, and selection process
- Address questions



Agenda

**2018 Heliophysics
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8:45	Welcome and Introductions	Peg Luce, NASA HQ
9:00	Overview of the 2018 Heliophysics MO Solicitations	Dan Moses, NASA HQ
9:20	Overview of the Evaluation, Categorization, Selection Process	Dan Moses, NASA HQ
9:40	Technology Demonstration MO Scientific and Technological Evaluation	Roshanak Hakimzadeh, NASA HQ
10:00	Technology Demonstration MO Technical, Management, and Cost Evaluation	Andrea Salas, NASA LaRC
10:20	Break and Questions	All
10:40	Science MO Science Evaluation	Dan Moses, NASA HQ
11:00	Science MO Technical, Management, and Cost Evaluation	James Florance, NASA LaRC
11:20	Break and Questions	All
11:40	Program Requirements	Mike Delmont, NASA GSFC
12:00	Break and Lunch	All
12:30	International Participation	Jake Parsley, NASA HQ
12:45	Export Control	Ken Hodgdon, NASA HQ
1:00	Mission Operations and Communication Services	John Hudiburg, NASA HQ
1:20	Heliophysics IMAP Rideshare Approach	Alan Zide, NASA HQ
1:30	IMAP ESPA Grande Accommodations	Garrett Skrobot, NASA KSC/LSP
2:00	CubeSat Investigations	Anne Sweet, NASA HQ/LSO
2:20	International Space Station Investigations	Kenol Jules, NASA JSC (presented by Dan Moses)
2:40	Balloon Investigations	Debora Fairbrother, NASA WFF
3:00	Wrap-Up	All



Questions

- Answers to questions received prior to the Workshop are included in presentations and/or being addressed on the Q&A web site.
- Questions submitted today will be addressed as time permits and as appropriate answers can be generated.
- Please submit your questions in writing so that we may best understand your intent.
- WebEx users, please submit questions via the WebEx chat lines.
- Questions may also be sent to:
 - HQ-TechDemo <hq-techdemo@mail.nasa.gov>
 - HQ-HPDMO <hq-hpdmo@mail.nasa.gov>
- Questions may be submitted until 14 days before the proposal due date. Questions and answers will be posted at the 2018 Heliophysics Mission of Opportunity Acquisition sites:
 - <https://soma.larc.nasa.gov/STP/tdmo/index.html>
 - <https://soma.larc.nasa.gov/2018HelioMO/>



Mission of Opportunities: Leveraging Explorers *and* Strategic Missions

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- The lengthy (5 year) gap between the 2011 and the 2016 Explorers AOs demonstrated that the Heliophysics science community needed more frequent opportunities for space flight investigations.
- This need was recognized in the 2013 NRC Decadal Strategy for Solar and Space Physics with a high priority call for accomplishing high-payoff, timely science goals with a revitalized Explorers program, including leveraged Missions of Opportunity (MOs)
- In addition to the MOs achieved through the Explorers program, the HPD committed to leveraging each strategic primary mission with an MO.
 - High-payoff science
 - Technology advancement enabling future missions
 - Significant technology development during Phase A of strategic missions is high risk
 - No technology development during strategic mission potentially limits the science advances of these missions
- The 2018 Heliophysics Mission of Opportunity Solicitations include both science and technology advancement as well as leveraging the Solar & Terrestrial Probes Program and Explorers Program.



2018 Mission of Opportunity Leveraged Programs

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- The Solar & Terrestrial Probes #5 (STP-5) / Interstellar Mapping and Acceleration Probe (IMAP) Announcement of Opportunity:
 - released 31 July 2017 as NNH17ZDA007O
 - included notification of NASA's intent to solicit "ride-along" Mission of Opportunity (MO) investigations in a future SALMON PEA
 - specified these MO investigations would
 - aid in addressing Heliophysics science objectives and
 - serve the needs of technology demonstrations
 - stated this ride share flight opportunity would be achieved via an Evolved Expendable Launch Vehicle Secondary Payload Adapter (ESPA) in the IMAP payload stack.



2018 Mission of Opportunity Leveraged Programs

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- The 2018 Explorers MIDEX Opportunity
 - Delayed to 2019 due to the size of the response to the 2016 Explorers AO
 - Explorers review is a serial process
 - MIDEX Mission of Opportunity advanced to coincide with MO leveraged from STP-5
 - Provides a MO proposal opportunity in 2018 for heliophysics science not amenable to access to space via IMAP ESPA ride share
 - Increased efficiency in solicitation and review
 - Improved budgetary profile



NASA Heliophysics Science Objective & Goals

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- The NASA Strategic Objective (2018 NASA Strategic Plan) that encompasses Heliophysics:
 - “Understand the Sun, Earth, Solar System, and Universe”.
- In response to the above strategic objective, the Science Mission Directorate conducts heliophysics investigations addressing the following science goals:
 - Explore the physical processes in the space environment from the Sun to the Earth and throughout the solar system;
 - Advance our understanding of the connections that link the Sun, the Earth, planetary space environments, and the outer reaches of our solar system; and
 - Develop the knowledge and capability to detect and predict extreme conditions in space to protect life and society and to safeguard human and robotic explorers beyond Earth
- Resource documents for NASA Heliophysics Science Goals
 - *2014 Science Plan for NASA’s Science Mission Directorate*
 - *Our Dynamic Space Environment: Heliophysics Science and Technology Roadmap for 2014-2033*
 - *Solar and Space Physics: A Science for a Technological Society - 2013 NRC Decadal Strategy for Solar and Space Physics*



NASA SMD SALMON-3 PEA-L & PEA-M

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- The Science Mission Directorate (SMD) Third Stand Alone Missions of Opportunity Notice (SALMON-3) Announcement of Opportunity (AO is the omnibus solicitation that is updated by each Program Element Appendix (PEA)).
- Two solicitations have been released for heliophysics investigations
 - 2018 Heliophysics TechDemo MO SALMON-3 PEA-L
 - 2018 Heliophysics Science MO SALMON-3 PEA-M
- All investigations proposed in response to these solicitations
 - must address the NASA Heliophysics Science Objective & Goals
 - must be implemented by Principal Investigator (PI) led investigation teams, and
 - must be implemented through the provision of space or near-space (sub-orbital in PEA-M) investigation

Important Note: These solicitations incorporate a large number of changes relative to the drafts and previous Heliophysics Mission of Opportunity solicitations, including both policy changes and changes to proposal submission requirements.



Solicitations Overview

PEA-L TechDemo MO

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NASA has released the **SALMON-3 PEA L: 2018 Heliophysics Technology Demonstration (TechDemo) Mission of Opportunity** for the purpose of soliciting Small Complete Mission (SCM) proposals for spaceflight demonstration of innovative medium Technology Readiness Level (mid-TRL) technologies that enable significant advances in NASA's Heliophysics Science Objectives and Goals.

- Proposal merit determined by the *magnitude* of heliophysics science advancement(s) enabled by the proposed TechDemo investigation.
- Science advancements enabled by the TechDemo investigation must be technically and scientifically feasible for missions initiated within the next 15 years (i.e. through the next NRC Decadal Survey interval).
- Significant science advancement is allowable within the duration of the TechDemo investigation itself, but this aspect is not a factor in the evaluation criteria (i.e. the science advancement can occur at any time in the next 15 years).
- High risk for high reward investigations are specifically solicited in order to obtain the most rapid technological advance. TMC evaluation does not change. Recommendation to the Selection Official will emphasize high risk tolerance for high reward investigations.
- Access to space is limited to rideshare on the IMAP ESPA.



Solicitations Overview

PEA-M Science MO

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NASA has released the **SALMON-3 PEA M: 2018 Heliophysics Science Mission of Opportunity** for the purpose of soliciting proposals for science investigations addressing NASA's Heliophysics Science Objectives and Goals.

- SCMs for flight on the IMAP ESPA are specifically solicited as STP MO.
- Traditional range of Explorers MO are also solicited:
 - SCM
 - ISS
 - Hosted Payload
 - CubeSat
 - SmallSat
 - Sub-Orbital Class (Balloons or SRLV)
 - Partner Missions of Opportunity (PMO)
 - New Missions for Existing Spacecraft (NMES)



Budget Planning

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- All planning is contingent on the realization of projections for future HPD budgets. The selection intentions herein are provided for planning purposes and should not be considered binding.
- NASA intends to select up to 5 MO SCM proposals for the IMAP ESPA flight opportunity (combined Science and TechDemo) and up to two Explorers-class MO proposals to proceed to a Phase A concept study.
- NASA intends to down-select two or more MO SCM proposals for the IMAP ESPA flight opportunity (combined Science and TechDemo) investigations and one or more Explorers-class MO proposals to proceed into Phase B and subsequent mission phases.



Solicitation Components

NASA Announcement of Opportunity (AO)

Stand Alone Missions Of Opportunity Notice #3
(SALMON-3)
NNH17ZDA004O

Program Element
Appendix M (PEA-M):
Heliophysics Science
Mission Of Opportunity

Program Element
Appendix L (PEA-L):
Heliophysics Technology Demonstration
Mission Of Opportunity

PMO
Partner Missions
of Opportunity

NMES
New Missions for
Existing Spacecraft

SCM
Small Complete Missions

SCM
Small Complete Missions

PIMMC: \$55M
PIMMC: \$35M
PIMMC
(PI Managed
Mission Cost)

Sub-orbital Class
1. Balloon
2. Suborbital Reusable
Launch Vehicle

1. ISS
2. Hosted Payload
3. CubeSat
4. SmallSat

Science
PIMMC:
\$75M

TechDemo
PIMMC:
\$25M-\$65M

Traditional Explorers Mission of Opportunity

IMAP (STP-5) ESPA



Proposal Opportunity Period and Schedule

dates	TechDemo MO	Science MO
Notification Proposal Due Date	11:59p.m. ET, Oct. 1, 2018	11:59 p.m. ET, Oct. 1, 2018
Due Date of Electronic Full Proposals in NSPIRES	11:59 p.m. ET, Nov. 30, 2018	11:59 p.m. ET, Nov. 30, 2018
Due Date of Full Proposal CD-ROMs	4:30 p.m. ET, Dec. 6, 2018	4:30 p.m. ET, Dec. 6, 2018
Selection Date for Phase A Studies (<i>Targeted</i>)	July 3, 2019	July 10, 2019
Concept Study Reports Due (<i>Targeted</i>)	May 4, 2020	May 11, 2020
Down-Selection Date (<i>Targeted</i>)	Nov. 2, 2020	Nov. 9, 2020
Launch Readiness Date Determined by primary (IMAP)	Oct. 1, 2024	Oct. 1, 2024

IMPORTANT NOTE: Due to the level of detail requested in Q&As about the IMAP ESPA Accommodations, the **Due Dates for Notification Proposals and Full Proposals** have been **delayed** so that better information can be provided.

Dates listed as *Targeted* are also subject to change in the future. The Launch Readiness Date is fixed by the Primary Payload (IMAP) and must be considered to be fixed.



Delay in Due Dates

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- Ride-share is still new territory for NASA SMD.
- The level of detail that has been requested in the Q&A concerning the IMAP ESPA is greater than anticipated.
- Additional time is required to resolve these questions
- Therefore the Proposal Notification Due Date and the Full Proposal Due Date have been delayed as noted in the proposal preparation schedule to allow resolution to questions relevant to investigation feasibility.
- The nature of ride-share opportunities is such that the capabilities of the upper-stage are driven by the launch service **procurement** conducted to meet the **requirements** of the **primary mission**.
 - Thus answers to detailed questions on maneuvers after IMAP is released from the ESPA/upper stage stack must envelope a the range of residual performance.
- An additional consideration in ride-share opportunities is that the Launch Readiness Date is determined by the primary payload.
 - Thus the LDR is fixed while the dates for the MO Step 1 selection, the CSR due date and the Step 2 down-selection may change.



References



2018 Heliophysics TechDemo MO Acquisition Home Page

The 2018 Heliophysics TechDemo MO Acquisition Home Page, available at <https://soma.larc.nasa.gov/STP/tdmo/index.html>, will provide updates and any addenda during the solicitation process. The contents of the TechDemo MO acquisition page include the following:

- Links to the NSPIRES for access to the solicitation
- Announcements
- Program library
- Technology Fair
- Q&As
- Preproposal Conference
- Evaluation Plan (to be posted)

2018 Heliophysics TechDemo MO Program Library

The Library provides additional regulations, policies, and background information. The Library is accessible at <https://soma.larc.nasa.gov/STP/tdmo/tdmo-library.html>



2018 Heliophysics Science MO Acquisition Home Page

The 2018 Heliophysics Science MO Acquisition Home Page, available at <https://soma.larc.nasa.gov/2018HelioMO/>, will provide updates and any addenda during the solicitation process. The contents of the Science MO acquisition page include the following:

- Links to the NSPIRES for access to the solicitation
- Announcements
- Program library
- Q&As
- Preproposal Conference
- Evaluation Plan (to be posted)

2018 Heliophysics Science MO Program Library

The Library provides additional regulations, policies, and background information. The Library is accessible at <https://soma.larc.nasa.gov/2018HelioMO/programlibrary.html>



Questions?



All questions pertaining to the TechDemo MO proposals must be addressed to:

Dr. Roshanak Hakimzadeh
Heliophysics TechDemo MO Program Scientist
Science Mission Directorate
NASA Headquarters
Washington, DC 20546-0001
Email: hq-techdemo@mail.nasa.gov

All questions pertaining to the Science MO proposals must be addressed to:

Dr. Dan Moses
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