

C.9 MARS DATA ANALYSIS

NOTICE: Clarified August 1, 2016. Proposals to analyze neutron and gamma ray datasets from Mars Odyssey are encouraged. New text is in bold.

Amended on April 11, 2016. This amendment delays the Step-2 due date for this program. Step-1 proposals are still due August 26, 2016, but Step-2 proposals are now due by October 28, 2016.

This Program Element continues to use a two-step proposal submission process described in Section 2 of Appendix C.1.

1. Scope of Program

The objective of the Mars Data Analysis Program (MDAP) is to enhance the scientific return from missions to Mars conducted by NASA and other space agencies. These include, but are not limited to, the following missions: Mars Pathfinder (MPF), Mars Global Surveyor (MGS), Mars Odyssey (MO), Mars Exploration Rovers (MERs), Mars Express (MEX), Mars Reconnaissance Orbiter (MRO), Phoenix (PHX), Mars Science Laboratory (MSL), and Mars Atmosphere and Volatile EvolutioN (MAVEN). Any proposal may incorporate the investigation of data from more than one mission. Additional information about these missions, as well as references containing preliminary science results, can be found on the Mars Exploration Program (MEP) homepage at: <http://mars.jpl.nasa.gov/>.

MDAP broadens scientific participation in the analysis of mission data sets and funds high-priority areas of research that support planning for future Mars missions. Investigations that use data derived from other sources (e.g., ground-based radar, Hubble) will also be considered. MDAP supports scientific investigations of Mars using publicly available (released) data.

Investigations submitted to this program must demonstrate how the research to be undertaken will directly improve our understanding of open science questions at Mars relevant to current hypotheses. Tasks responsive to this call include 1) data analysis tasks, 2) nondata-analysis tasks that are necessary to analyze or interpret the data, and 3) nondata-analysis tasks that significantly enhance the use or facilitate the interpretation of mission data. These tasks may incorporate theory, modeling, laboratory studies, correlative analyses, and/or other research. Proposals that include nondata-analysis tasks to enhance the use or facilitate the interpretation of mission data must incorporate the results of such tasks in the analysis or interpretation of mission data to be responsive to this call. MDAP does not support field studies or the acquisition of new astronomical observations.

An investigator may also propose in the following high-priority areas of Mars research that support planning for future Mars missions:

- Improved atmospheric models that further the understanding and forecasting of Mars atmospheric conditions that affect the orbital trajectories of spacecraft and/or the safe passage of spacecraft through the atmosphere, including aerobraking and aerocapture.

- Characterization of potential landing sites for future Mars exploration missions (e.g., geomorphology, distribution and size of rocks, pits, sand dunes, regional and local slopes, surface composition, and texture variability).
- Improved models for the Mars gravity field and global topography and planetary figure.
- Improvement of the geodetic network of Mars for precision landing.
- Analysis and comparison of Mars orbital and surface data to increase the predictive accuracy of surface characteristics of Mars from orbit.

The Mars Data Analysis Program is particularly interested in receiving proposals to analyze the extensive, but underutilized, gamma ray and neutron datasets from the Mars Odyssey mission. Many years worth of data from the neutron detector and the neutron and gamma ray spectrometers are available on the Geosciences Node of the PDS. [Added August 1, 2016]

For more information about the type of research supported by the MDAP, please refer to the abstracts of currently funded investigations that are available online at:

<http://nspires.nasaprs.com/>.

2. Programmatic Information

2.1 Program Exclusions

Investigators proposing studies that do not focus on the tasks listed in Section 1 are advised that such studies are not appropriate for MDAP, but may be suitable for submission to the core programs of this NRA for Planetary Science.

Proposals to conduct comparative studies between Mars and other Solar System objects are not responsive to this call and are directed to the most appropriate core program in Planetary Science.

Investigators who wish to propose to produce data products (e.g., cartographic products, such as geologic, topographic, or mineral maps, and/or calibration data) that are not part of a larger science investigation are directed to C.7 Planetary Data Archiving, Restoration and Tools (PDART).

2.2 Relevance Statement Requirement

Step-2 Proposals to this Program Element must discuss relevance in a (4000-character maximum) text box on the cover pages via the NSPIRES web interface for this Program Element. This section is outside of the 15-page Scientific/Technical/Management Section and the relocation of the relevance discussion does not decrease that 15-page limit. This requirement supersedes Section 2.3.5 of the *NASA Guidebook for Proposers* and the *ROSES Summary of Solicitation*, and the omission of this section is sufficient reason for a proposal to be returned without review.

The relevance discussion must explicitly refer to this Program Element and the section of the

solicitation to which the proposal is responsive. If the proposed work is close in scope to research covered by any other Program Element, this discussion must also justify why it is more relevant to this Program Element than that other Program Element. This discussion may not be used to address the proposal's intrinsic merit, budget justification, or any other factor that remains in the 15-page main body, or any other section, of the proposal.

2.3 Planetary Science Division Early Career Fellowship Program

Proposers to this Program Element may apply for Early Career Fellowships (ECFs). See Program Element C.16 for a description of the application and evaluation process.

2.4 Data Management Plans (DMPs)

Appendix C.1, §3.5, discusses the requirements for DMPs in proposals to this Program Element. Please note that DMPs are mandatory for this Program Element, and must be placed in a special section not to exceed two pages in length, immediately following the References and Citations section of the Scientific/Technical/Management portion of the proposal.

3. Resources: Information, Data, and Facilities

3.1 Limits on Use of Mission Data

For proposals that contain mission data analysis, planetary spacecraft mission data to be used in proposed investigations must be available in the Planetary Data System (PDS) or equivalent publicly accessible archive at least 30 days prior to the proposal submission date. Spacecraft data that have not been obtained yet (i.e., future mission data) or those that have not been accepted for distribution in approved archives are not eligible for use in investigations. Regardless of the archive(s) used, if the data to be analyzed have issues that might represent an obstacle to analysis, the proposers must demonstrate clearly and satisfactorily how such potential difficulties will be overcome. Investigators funded by spacecraft missions who wish to apply, must demonstrate clearly how the proposed research does not overlap and is not redundant with data analysis, duties, or responsibilities already funded by their respective mission(s). Please see C.1 The Planetary Science Division Research Program Overview, for more information.

3.2 Facilities and Data Sources Available to Proposers

Refer to ROSES Appendix C.1, §4, for a detailed list of the data and astromaterials resources, and facilities available to proposers to this Program Element, and how to use them. If their use is anticipated, this should be discussed and justified in the submitted proposal (especially note the provision for such discussion in the proposal section entitled Facilities and Equipment). Also note that, per the directions in Section 2.3 of the *NASA Guidebook for Proposers*, a letter of support may be required from any facility required for the proposed effort.

Documents that describe the research priorities for Mars exploration include:

- Mars Exploration Program Analysis Group (MEPAG) reports (<http://mepag.jpl.nasa.gov/>) including *Mars Scientific Goals, Objectives, Investigations, and Priorities* [2010 and subsequent updates] and
- The recommendations of the Committee on the Planetary Science Decadal Survey of the National Research Council as described in the Space Studies Board report *Visions and Voyages for Planetary Science in the Decade 2013-2022* [2011], available at http://www.nap.edu/catalog.php?record_id=13117
- *An Astrobiology Strategy for the Exploration of Mars* [2007], by the Space Studies Board (SSB) of the National Research Council (NRC) (http://www.nap.edu/catalog.php?record_id=11937).

Additional information is available on the MEP web site at: <http://mars.jpl.nasa.gov/>.

3.3 Geologic Maps

Proposers who plan investigations involving geologic mapping should consult Appendix C.1, Section 3.6, for guidance on submission and requirements for publication of U.S. Geological Survey (USGS) maps.

4. The Proposal Submission Process

This Program Element uses a two-step proposal submission process described in Section 2 of Appendix C.1.

Proposers are reminded that Step-1 proposals are mandatory and must be submitted by the proposing organization.

Proposals must follow all formatting requirements that are described Appendix C.1 and in Chapter 2 of the *NASA Guidebook for Proposers*. Note that these requirements have been updated in 2016. Violation of these rules is sufficient ground for a proposal to be rejected.

5. Summary of Key Information

Expected program budget for first year of new awards	~ \$3.0M
Number of new awards pending adequate proposals of merit	~ 25-30
Maximum duration of awards	4 years
Due date for Step-1 proposals	See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i> .
Due date for Step-2 proposals	See Tables 2 and 3 in the <i>ROSES Summary of Solicitation</i> .
Planning date for start of investigation	6 months after proposal due date.

Page limit for the central Science/Technical/Management section of proposal	15 pp; see also Chapter 2 of the <i>NASA Guidebook for Proposers</i>
Relevance	This program is relevant to the Planetary Science questions, and goals in the NASA Science Plan. Proposals that are relevant to this program are, by definition, relevant to NASA.
General information and overview of this solicitation	See the <i>ROSES Summary of Solicitation</i> .
Detailed instructions for the preparation and submission of proposals	See the <i>NASA Guidebook for Proposers</i> at http://www.hq.nasa.gov/office/procurement/nraguidebook/ .
Submission medium	Electronic proposal submission is required; no hard copy is required or permitted. See Section IV of the <i>ROSES Summary of Solicitation</i> and Chapter 3 of the <i>NASA Guidebook for Proposers</i> .
Web site for submission of Step-1 and Step-2 proposals via NSPIRES	http://nspires.nasaprs.com/ (help desk available at nspires-help@nasaprs.com or (202) 479-9376)
Web site for submission of Step-1 and Step-2 proposals via Grants.gov	http://grants.gov (help desk available at support@grants.gov or (800) 518-4726)
Funding opportunity number for downloading an application package from Grants.gov	NNH16ZDA001N-MDAP
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