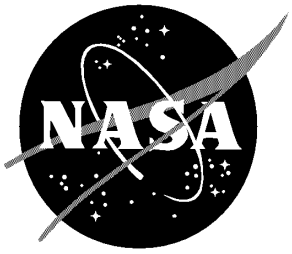

National Aeronautics
and Space Administration

AUGUST 29, 2001
AO 01-0SS-04

ANNOUNCEMENT OF OPPORTUNITY

"MARS EXPLORATION ROVER MISSION PARTICIPATING SCIENTIST PROGRAM"

Notice of Intent Due: September 28, 2001
Proposals Due: December 5, 2001

OMB Approval No. 2700-0085

Mars Exploration Rover Mission
Participating Scientist Program

Announcement of Opportunity

AO 01-OSS-04
Release Date: August 29, 2001

Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

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1. DESCRIPTION OF THE OPPORTUNITY

1.1 Introduction

The National Aeronautics and Space Administration (NASA) Office of Space Science (OSS) solicits proposals for Participating Scientist (PS) investigations for the Mars Exploration Rover 2003 mission through this Announcement of Opportunity (AO). The Mars Exploration Rover (MER) mission has as its primary objective the placing of two mobile science laboratories on the surface of Mars to remotely conduct geologic investigations in order to characterize a diversity of rocks and soils that may hold clues to past water activity. The NASA Office of Space Science has formally selected the "Athena" science payload for the MER mission through a previous AO that will serve multiple investigations led by the Athena Principal Investigator (PI) and that will also provide the data for the Participating Scientist investigations to be selected through this AO. The Athena Science Team will, therefore, ultimately consist of the Athena PI, Athena Co-Investigators (Co-I's), and Participating Scientists (PS's). Once selected, PS's also become members of the MER Science Operation Working Group (SOWG) and may become members of other Project Working Groups as determined by the NASA Headquarters MER Program Scientist, the Jet Propulsion Laboratory MER Project Scientist, and the Athena PI.

Participating Scientist proposals in response to this AO may include investigations that are instrument specific or interdisciplinary in nature but must include both a science analysis and an operational component in order to be considered. It is anticipated that about 25-30 PS investigations will be selected and funded at approximately $40K per year in Fiscal Year 2002, $70K in FY 2003, $120K in FY 2004, and $110K in FY 2005. Investigations are being sought, but are by no means limited to, those that address the following MER Science Themes: Geology; Geochemistry and Mineralogy; Soil and Rock Physical Properties; Atmospheric Science; Long-term Strategic Planning; and Technology Planning.

After selection, the PS's will coordinate their activities and data analyses with the present PI and Co-I's on the Athena Science Team. PS's selected under this AO will have full rights of access to mission data and will be expected to participate in data analysis, archiving, and publication, as well as in a broad program of Education and Public Outreach (E/PO) activities being planned by the Jet Propulsion Laboratory (JPL). Once selected, PS's will be under financial contract with JPL, which is assigned by NASA to manage the MER Program (see Section 5).

All technical information about the MER mission and associated Athena payload that will be needed for the preparation of a proposal submitted in response to this AO is contained within the Proposal Information Package (PIP) located at the following website: http://merpip.jpl.nasa.gov/. Questions about the PIP may be submitted in writing or electronically to the MER Project Scientist:

Dr. Joy Crisp
Mail Stop 241-105
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109-8099
USA

Facsimile: 818-393-5421
E-mail: Joy.Crisp@jpl.nasa.gov

Questions about this AO may be submitted in writing or electronically to the NASA Headquarters MER Program Scientist (see Section 6.2). The Project Scientist and Program Scientist will answer questions as promptly as possible, and each day Monday through Friday, there will be one update by 9 AM Eastern Time to the question and answer list at the following NASA HQ website: http://spacescience.nasa.gov/ by opening "Research" and then "Current (Open) Solicitations" from the menu. Proposers are encouraged to refer to this web page for updated information. **Investigators should only use information about MER and the Athena payload that is supplied in the PIP and this AO when writing their proposals**. If more information about MER and the Athena payload is required than is contained within these two documents, inquiries may be submitted to either the Project or Program Scientist and a response will be posted as rapidly as possible. Although questions will be answered during the entire AO proposal period, NASA will not extend the due date for proposals based on questions received immediately prior to the proposal submission date unless NASA determines that answers include substantive information requiring review by all potential proposers. Anonymity of persons who submit questions will be preserved.

1.2 Responsibilities of the Participating Scientist

In addition to completing their proposed science investigations, each selected MER PS is also expected to participate in training activities (see Section 5) and mission operations, which will be conducted at the Jet Propulsion Laboratory. There is no distinction between PS's who propose to use the data from one instrument compared with those who propose to use data from a variety of instruments. Section 3 lists the MER instruments, with more detailed technical information described in the PIP.

After selection, Participating Scientists will be given an opportunity to learn about the different positions on the Athena Science Team and identify those in which they would be interested. Currently there are three positions for which PS's may be qualified during mission operations: Science Operation Working Group (SOWG) Chairs, Science Theme Leads, and Payload Downlink Leads. A description of each of these positions can be found in the PIP (http://merpip.jpl.nasa.gov/). Two of the six SOWG Chairs will be the Athena PI and Deputy PI. After selection of the Participating Scientists, the other four will be recommended by the Athena PI and selected by NASA Headquarters. Science Theme Leads will be elected by members composed of PS's and existing Athena Co-I's of each Science Theme. Payload Downlink Leads will be designated by each Payload Element Lead with concurrence by the Athena PI. If a PS assumes the responsibilities of any of these positions, his/her budget may be augmented to reflect additional duties and travel required for this position.

In general, the role of the PS includes:

- Execute their proposed scientific investigation;
- Participate in Athena Science Team meetings;
- Participate in operations training, MER Project Operational Readiness Tests, rover field tests, and other operations tests;
- Serve as SOWG members;
- Serve as members of Science Theme Groups;
- Prepare preliminary reports, quick-release products, detailed scientific summaries, and public information releases, as appropriate;
- Deposit reduced data, associated software, documentation, and other pertinent investigation information for which they are responsible in the Planetary Data System, in accordance with the Mars Program Data Management Plan and MER Archive Generation, Validation, and Transfer Plan; and

- Participate in Mars Exploration Program E/PO activities.

These activities are to be undertaken in a manner consistent with the "*Mars Exploration Program Data Management Plan*," which is currently being written and will be made available to PS's after their selection. A comprehensive Mars Exploration E/PO Program Plan is also now under development.

1.3 Scope and Limitations of Proposals

Participation is open to all categories of organizations, both domestic and foreign, including educational institutions, profit and nonprofit organizations, NASA centers, and other Government agencies. In accordance with NASA policy, all investigations by non-U.S. participants will be conducted on the basis of no exchange of funds.

The current Athena Team PI and Co-I's are not eligible to propose to this AO.

Only the PI from each investigation selected through this AO will be designated as a Participating Scientist on the Mars Exploration Rover Mission. Therefore, PS proposals should only include Co-investigators or collaborators if they are **critical** to complete the proposed science investigation. In particular, **such ancillary personnel may not substitute for the PS in mission activities**, such as instrument calibration, Operational Readiness tests, FIDO field trials, Project Science Group/Athena Science Team meetings, and landed operations for the duration of the mission.

Proposed investigations must be of primary relevance to a least one of the objectives listed in Section 2.

Proposals must demonstrate that a PS will actively participate in mission operation activities. There will be a separate announcement at a later date for proposals to perform only data analyses from the MER mission.

1.4 Mars Exploration Program Data Policy

The following general rules apply to data rights, use, and publication of Mars Exploration Rover data:

- There is no period of exclusivity for any data collected by the spacecraft or instruments for the MER mission. Therefore, all data are expected to be transferred to the Planetary Data System (PDS) as soon as possible after validation, which should not take more than six months.

- Data deposited in the PDS must contain the appropriate calibration information and ancillary data to make them usable to the general scientific community. More refined versions of archive data may be delivered to PDS as algorithms and ancillary information are updated.

- During the generation/validation period, the use, analysis, or release of raw and derived products should be done only with the agreement of the Athena PI. It is expected that all investigators will publish their results in a timely manner in the open, peer-reviewed scientific literature.

- Significant subsets of data will be released earlier in support of the MER public outreach and education activities; such data release may be available as postings on the Internet (e.g., World Wide Web) or to the press and will conform to the mission's Public Release Policy and the *"Mars Exploration Program Data Management Plan,"* both of which are still being written.

1.5 Education and Public Outreach Requirements

The Office of Space Science (OSS) expects education and public outreach to be a significant part of each OSS flight program and research discipline, and strongly encourages space science researchers to engage actively in education and public outreach as an important component of their NASA-supported professional activities. In order to achieve this goal, OSS has developed a comprehensive approach for making education at K-12 education levels, as well as the enhancement of public understanding of space science, integral parts of all of its missions and research program. The two key documents that establish the basic policies and guide all OSS education and outreach activities are a strategic plan entitled *Partners in Education: A Strategy for Integrating E/PO Into NASA's Space Science Programs* (March 1995), and an accompanying implementation plan entitled *Implementing the OSS E/PO Strategy* (1966). Both can be access by selecting "Education and Outreach" from the menu on the OSS homepage at Internet URL http://spacescience.nasa.gov, or from Dr. Jeffrey Rosendhal, OSS, Code S, NASA Headquarters, Washington, DC 20546-0001, USA.

Beyond this general mandate, the comprehensive exploration of Mars through a long-term series of missions is expected to provide a singular opportunity to draw on broad popular interest about Mars to both engage the public and to work with the formal education system to improve the teaching of science, mathematics and technology in the United States. Therefore, E/PO will be an integral element of the Mars Exploration program in general and MER mission in particular. In accord with established OSS policies, 1-2 percent of the total Mars Exploration Program budget will be allocated to E/PO, and all selected NASA-funded scientific participants in the Mars Exploration Program will be expected to become actively involved in planning and implementing an E/PO program.

MER Participating Scientists will be expected to include provisions for participation in the common Mars Exploration Program E/PO program that is now underway as part of their proposals. Individuals should be prepared to spend an average of ~5% of their time, as part of their normal ongoing work, supporting E/PO activities. Such activities may include, but are not limited to: carrying out E/PO programs in their own communities; developing ideas for creative and worthwhile educational materials; preparing written background information suitable for primary and secondary school educational resources; and preparing portions of their mission's data for use in E/PO materials. Therefore, proposals must include an explicit statement in the Contractual Statement of Work that proposers are willing to participate in E/PO on this basis and must budget appropriately for such work as part of their proposal. This Contractual Statement should also include a sketch of ideas and activities for the PI's participation in the Mars E/PO program. The umbrella JPL Mars Exploration E/PO program is already planning and implementing a number of national efforts. The long-range goal of having PIs associated with individual Mars missions involved in E/PO is to establish a network of Mars scientists across the country who are both carrying out their own E/PO programs and acting as local agents for the Mars Program's national efforts.

Additional information on the OSS E/PO Program can be found in the *OSS FY 2000 Annual Report* (January 2001). This document may also be accessed through the OSS homepage following the directions given at the beginning of this section. Additional information on the Mars Exploration E/PO program may be obtained from:

Ms. Michelle Viotti
Education and Outreach Coordinator
Mail Stop 264-438
Jet Propulsion Laboratory

4800 Oak Grove Drive
Pasadena, CA 91109-8099

Telephone: 818-354-8774
E-mail: Michelle.Viotti@jpl.nasa.gov

2. AO OBJECTIVES

2.1 Specific MER Science Objectives

The objectives of the MER Participating Scientist program are to enhance the science data return from the Mars Exploration Rovers by broadening participation in the mission, augmenting the existing MER science team to include investigations not now represented, and maximizing the contribution of the Mars Exploration Rovers to the future exploration and scientific understanding of Mars. The purpose of this opportunity is to select investigations for data analysis and to add more scientists to the current Athena Science Team for the purpose of testing, surface operations, data products, and archiving.

Participating Scientists may propose **any** investigation that addresses the objectives listed in this Section. Investigations that are similar or duplicate research of current Athena Science Team members will be allowed, and PS's will be encouraged to work in a collaborative manner with Athena Science Team members after selection. Skilled individuals with diverse scientific backgrounds and field experience are needed since there are two MER rovers operating at the same time. However, based upon the expertise of current members of the Athena Science Team, there are several types of investigations that are particularly desired through this AO:

- Derivation of atmospheric profiles (density, pressure, temperature) from calibrated Inertial Measuring Unit (IMU) data during entry of the landers for application to future Mars missions;
- Atmospheric studies conducted during surface operations;
- Using the interactions of the rover with different terrains (wheels and Rock Abrasion Tool) to derive physical-mechanical properties of rocks and soils;
- Calibration of orbital remote sensing data using ground based measurements from the rovers;
- Understanding of the mineralogy and geochemistry of soils, clays, and weathering products;
- Studies of products and processes associated with impact craters; and
- Environmental constraints and effects on spacecraft performance.

The Mars Exploration Rover 2003 Mission will conduct *in situ* exploration of Mars in order to achieve the following mission-level science objectives. These objectives have been derived from prioritized science investigations within the Mars Exploration Program:

1) Search for and characterize a diversity of rocks and soils that hold clues to past water activity (water-bearing minerals and minerals deposited by precipitation, evaporation, sedimentary cementation, or hydrothermal activity);

2) Investigate landing sites, selected on the basis of orbital remote sensing, which have a high probability of containing physical and/or chemical evidence of the action of liquid water;

3) Determine the spatial distribution and composition of minerals, rocks, and soils surrounding the landing sites;

4) Determine the nature of local surface geologic processes from surface morphology and chemistry;

5) Calibrate and validate orbital remote sensing data and assess the amount and scale of heterogeneity at each landing site;

6) For iron-containing minerals, identify and quantify relative amounts of specific mineral types that contain H_20 or OH, or are indicators of formation by an aqueous process, such as iron-bearing carbonates;

7) Characterize the mineral assemblages and textures of different types of rocks and soils and put them in geologic context; and

8) Extract clues from the geologic investigation, related to the environmental conditions when liquid water was present and assess whether those environments were conducive for life.

2.2 Mars Exploration Program Objectives

To support future Mars Exploration Program missions, the program has established the following mission level objectives:

1) Demonstrate long-range traverse capabilities by mobile science platforms to validate long-lived, long-distance rover technologies;

2) Demonstrate complex science operations through the simultaneous use of multiple science-focused mobile laboratories; and

3) Validate the standards, protocols, and capabilities of NASA-provided and internationally-provided orbiter-based Mars communications infrastructure.

To support these objectives, the Mars Exploration Rover Mission will conduct mission operations and technology validation experiments, which may include:

- Characterizing rover mobility in the Mars environment;
- Quantifying rover maneuverability and trafficability in multiple terrain topologies and soil types;
- Quantifying environmental effects which may impact system performance and survivability;
- Characterizing system performance and reliability;
- Characterizing environment state estimation capabilities; and
- Characterizing operational performance of task-level communications and commanding of multiagent mobile science laboratories at planetary distances.

MER PS investigations may be proposed that meet these or similar objectives but they should recognize that the landing site may preclude some experiments from being conducted during surface operations.

Proposers may not request changes to flight hardware in order to achieve their proposed investigations.

3. BACKGROUND

3.1 Mars Exploration Rover Mission

The Mars Exploration Rover mission consists of two independent but identical rovers, MER-A and MER-B. MER-A has a launch window from May 30 to June 16, 2003, with a constant arrival date of January 4, 2004. The launch window for MER-B is June 27 to July 14, 2003, with a constant arrival date of January 25, 2004. MER-A will be launched on a Delta II 7925 expendable launch vehicle and MER-B on a Delta II 7925H, both from Cape Canaveral, Florida. During their respective cruise phases, no science activities are planned (all instruments are enclosed within the lander). MER-A and MER-B will land on Mars in restricted latitude ranges from 5°S to 15°N for MER-A and 10°S to 10°N for MER-B.

Both spacecraft will approach Mars on a posigrade trajectory designed to support continuous direct communications with Earth during Entry, Descent, and Landing (EDL). The spacecraft will enter the Martian atmosphere and initially be slowed by atmospheric drag acting on its aeroshell (see the PIP for a more detailed description and illustration of the EDL sequence). At about 10 km altitude, a parachute will be deployed, followed by jettison of the aeroshell and lander separation. The lander then drops beneath the backcover on a tether. Approximately 2.4 km above the surface, radar will be used to sense the surface. About 130 m above the surface, solid rockets will slow the vertical velocity. Airbags will be inflated prior to bridle cut to cushion final impact, and then retracted after landing. After deflation and retraction of the airbags, the triangular lander petals open, which rights the lander and allows the rover to drive off and begin exploration of the landing site.

The exact landing sites will be chosen approximately one year before launch using previous spacecraft data augmented by new data provided by Mars Global Surveyor and Mars Odyssey. Currently proposed landing sites for MER are shown at the following website: http://marsoweb.nas.nasa.gov/landingsites/.

Each rover will operate through its primary mission of 90 Martian days. During operations, the rovers will acquire panoramic spectral and thermal emission point-IR images of the surface, take atmospheric measurements, and, using the instrument deployment device, deploy the Alpha Particle X-ray Spectrometer (APXS), Mössbauer Spectrometer, Microscopic Imager, and Rock Abrasion Tool (RAT) for detailed studies of rocks and soils. At least one of the rovers will traverse a total distance of 600 m with a goal of 1000 m to validate long-lived, long-distance rover technologies in support of future Mars Exploration Program missions.

Each Mars Exploration Rover carries six payload elements, a magnet suite, one stereo pair of navigation cameras mounted on the Pancam mast, and two stereo hazard camera pairs mounted on the front and back of the rover. The six payload elements are: Pancam, Mini-TES, APXS, Mössbauer Spectrometer, Microscopic Imager, and the Rock Abrasion Tool (see Section 3.2).

3.2 Scientific Instruments

Each Mars Exploration Rover carries an integrated payload instrument package (described in more detail in the PIP). The science instrument suite carried on each rover will make a series of measurements of the Martian surface that are designed to shed new light on the past environments, history, and geology of the planet. These instruments, which were selected through an open competitive selection process (AO 97-

OSS-04 for the "Mars Surveyor Program: 2001 Orbiter, Lander, Rover Missions") are collectively known as the "Athena" integrated payload instrument package and include:

- Panoramic Camera (Pancam): panoramic color images for geologic context, rock and soil texture, iron-bearing mineralogy.
- Miniature Thermal Emission Spectrometer (Mini-TES): panoramic point mid-infrared spectra images for mineral identification and abundance determination (carbonates, clays, oxides, silicates, etc.).
- Mössbauer Spectrometer: detailed analyses to identify specific types of iron-bearing minerals present, and iron oxidation state.
- Alpha Particle X-Ray Spectrometer (APXS): detailed analyses of selected rocks and soils to determine their elemental composition.
- Microscopic Imager: close-up images of fine-scale rock and soil texture.
- Magnet Array: magnetic targets to collect magnetic portions of the airborne dust, for analysis by other instruments.
- Rock Abrasion Tool: mechanism for removing weathered rind from Mars rocks to provide freshly exposed surfaces for examination by Athena instruments.

Currently, the Athena Science Team consists of the Athena PI (Dr. Steven Squyres, Cornell University) and 21 Co-I's. Each Athena payload element (Pancam, Mini-TES, APXS, Mössbauer, Microscopic Imager, and Rock Abrasion Tool) has a Payload Element Lead (PEL), selected by the Athena PI from among the Co-I's. A full list of the team members and PEL's is given in the PIP.

The Athena PI is ultimately responsible for ensuring that preflight calibration and tests are carried out for the Athena payload, for operating the Athena payload elements on the surface of Mars, and for assuring that the data products associated with the Athena payload are generated, validated, and archived.

4. PROPOSAL OPPORTUNITY PERIOD

This AO is issued for the singular opportunity of the MER mission as described herein and in the other referenced background material and proposals are due by the single date given in Section 8 below.

5. REQUIREMENTS AND CONSTRAINTS

Management of NASA's Mars program is the responsibility of the Mars Exploration Program located in the Office of Space Science (OSS), NASA Headquarters, Washington, DC. The Mars Exploration Rover Project is managed by the Space Science Flight Directorate at the Jet Propulsion Laboratory (JPL), Pasadena, California, which also manages the Mars Global Surveyor and the Mars Odyssey 2001 Missions. The Space Science Flight Directorate is responsible for implementation of the MER Mission and the operation of Mars exploration missions through the OSS JPL Mission Management Office.

NASA has assigned administrative management of selected investigations to the MER Science Manager to the Jet Propulsion Laboratory. After selection, each Participating Scientist shall provide an Implementation Plan to the MER Science Manager, including a schedule for deliverables (software, data products, reports, plans), and details regarding plans for data analysis, computing facilities, Ground Data System support, software development, support of instrument calibration, data archiving, participation in operations testing (see below), and participating in E/PO activities. The Participating Scientists shall provide quarterly reporting to the MER Science Manager on the items in their Implementation Plan. The reports should include, but not be limited to: Accomplishments over past quarter (including development and test of software algorithms, lessons learned in operations testing, and operations training); plans for

next quarter; risks, issues, concerns; schedule performance; financial performance; recovery plans; and deliverables status.

Participating Scientists are expected to participate in calibration and training activities before and after launch. Therefore, an approximate list of training and mission operations activities that PS's **must** include in their travel budget are:

- Four Athena Science Team/MER Project Science Group (PSG) Meetings per year, three in Pasadena, California, and one at Cornell University in Ithaca, NY, each lasting approximately three days. One of these meetings may be in Europe in FY 2002 and combined with a 2-day fieldtrip.
- At least half of the following Operational Readiness Tests at JPL:
  - Five 4-day tests in FY 2003 (plus one day of training)
  - Three 4-day tests in FY 2004 (plus one day of training)
- At least one of each of the following two pairs of rover tests:
  - Two 10-day rover "field tests" at JPL in the second half of FY 2002 and early FY 2003, respectively; and
  - Two 10-day rover "field tests" at JPL in mid to late FY 2003
- Mars Landed Operations at JPL for approximately 15 weeks during the period January 3, 2004, through May 7, 2004 (it is recognized that the PS may need to return back to his/her home institution for short visits during surface operations).

The exact number of PS trips and their durations will be negotiated with the Project but they must be consistent with any required minimum training necessary for participation in the rover operations and a more well-developed Project schedule for operations tests (the test schedule is only preliminary at the time of writing of this AO). Where appropriate, additional time may be spent at JPL in conjunction with other required trips to work with the Mars Exploration E/PO Program to plan and coordinate E/PO activities.

6. PROPOSAL SUBMISSION INFORMATION

6.1 Notice of Intent to Propose

A Notice of Intent (NOI) signifying the writer's intent to submit a proposal in response to this AO is requested to be submitted by all proposers via the World Wide Web site http://props.oss.hq.nasa.gov by the schedule noted below. Proposers without access to the Web or who experience difficulty in using this site should send an E-mail to dtripp@hq.nasa.gov requesting assistance.

To the extent the following information is known by the NOI due date, the Website for NOI's will request the following information:

- Name, address, telephone number, fax number, E-mail address, and institutional affiliation of the PI.
- Full names and institutional affiliations of any Co-Investigators (Co-I's). If any Co-I's or other team members are from non-U.S. institutions, the organization that will provide support for these people should be identified in the Comments box on the form.
- A brief statement (150 words or less) that includes all of the following:

- The anticipated scientific objectives of the proposed investigation, including designation of the Mars Exploration Rover instrument(s) relevant to the investigation; and
- A brief statement of commitment to the OSS Education/Public Outreach goals and objectives and to participating in the Mars Exploration Program E/PO effort.

Note that all information provided in an NOI is for NASA planning purposes only, is confidential, and is replaced by information in the final proposal.

6.2 Headquarters Contact for Further Information

For scientific and technical questions or inquiries, contact:

Dr. Catherine Weitz
Solar System Exploration Division
Code SE
Office of Space Sciences
NASA Headquarters
Washington, DC 20546
FAX: (202) 358-3097
E-mail: cweitz@hq.nasa.gov

6.3 Format and Contents of Proposals

Appendix A contains general NASA policies for proposals which is considered binding unless specifically amended in this AO. In order to facilitate evaluation, NASA also requires a uniform proposal format, described in Appendix B, for all proposals submitted in response to this AO. Failure to follow this outline may result in reduced rating during the evaluation process or, in extreme cases, could lead to rejection of the proposal without review.

An official of the PI's institution who is authorized to certify institutional support and sponsorship of the investigation, as well as the management and financial parts of the proposal, must sign the required Cover Page of the proposal (see Appendix B).

6.4 Quantity

Proposers must provide 20 copies of their proposal, plus the original signed proposal by the due date given in Section 8.

6.5 Submittal Address

Proposals from both U.S. as well as non-U.S. organizations sources must be received at the following address by the due date given in Section 8 of this AO:

Mars Exploration Rover Participating Scientist Program
NASA Peer Review Services
Suite 200
500 E Street, SW
Washington, DC 20024-2760
USA
Tel: 202-479-9030

6.6 Notification of Receipt

NASA will notify proposers in writing or by E-mail that their proposals have been received. Proposers not receiving this confirmation within two weeks after submittal of their proposals should contact the Mars Exploration Rover Program Scientist at the address given in Section 6.2.

6.7 Guidelines Applicable to Non-U.S. (Foreign) Proposals and Proposals Including Non-U.S. Participation.

6.7.1 General Policies

(1) NASA welcomes proposals from outside the U.S. However, foreign entities are generally not eligible for funding from NASA. Therefore, unless otherwise noted, proposals from foreign entities should not include a cost plan unless the proposal involves collaboration with a U.S. institution, in which case a cost plan for only the participation of the U.S. entity must be included. Proposals from foreign entities and proposals from U.S. entities that include foreign participation must be endorsed by the respective Government agency or funding/sponsoring institution in the country from which the foreign entity is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed. Letters of endorsement are to be included in and submitted with the proposal. Copies of faxed or
E-mailed letters of endorsement from non-U.S. participants may be substituted in the submitted proposals as long as original signed letters are received by the date and time specified in Section 8.0 of the AO.

(2) All foreign proposals must be typewritten in English and comply with all other submission requirements stated in this AO. All foreign proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date. Those received after the closing date will be treated in accordance with Appendix A, Section VII. Foreign sponsors may, in exceptional situations, forward a proposal without endorsement if the endorsement is not possible before the announced closing date. In such cases, the NASA sponsoring office should be advised when a decision on endorsement can be expected.

(3) After selections are made, successful and unsuccessful Principal Investigators will be contacted directly by the NASA sponsoring office. Should a non-U.S. proposal or a U.S. proposal with foreign participation be selected, NASA's Office of External Relations will arrange with the foreign sponsor for the proposed participation on a no-exchange-of-funds basis, in which NASA and the foreign sponsor will each bear the cost of discharging their respective responsibilities.

It is the policy of NASA to establish formal international agreements with foreign partners in cooperations on flight missions. For major contributions, either by a foreign partner to a U.S. program or by a NASA-funded party to a foreign-led program, these agreements will be either a Memorandum of Understanding (MOU) or an implementing agreement under a framework agreement. For less significant exchanges, the agreement for the entire cooperation may take the form of a Letter of Agreement (LOA). For those cooperative contributions that will entail execution of a LOA (in lieu of a MOU), the sponsoring foreign entity's letter of endorsement to support the proposed foreign contribution (if selected) must contain either (1) a clear statement that

the sponsoring foreign entity is legally empowered to bind its own national government or (2) advance agreement that any LOAs required will be governed by U.S. law.

In the event that a non-U.S. proposal is selected, NASA will contract with a U.S. lead entity for performance of the U.S.-funded elements of the investigation.

6.7.2 Export Control Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation

Proposers should be aware that investigations selected for Phase A that include international participation, either through involvement of non-U.S. nationals and/or involvement of non-U.S. entities must include in their proposal a section discussing compliance with U.S. export laws and regulations; e.g., 22 CFR 120-130, *et seq*. and 15 CFR 730-774, *et seq*., as applicable to the scenario surrounding the particular international participation (see Appendix B.I.4). Proposers must also comply with NASA FAR Supplement clause 1852.225-70 entitled "Export Licenses." The discussion must describe in detail the proposed international participation and is to include, but not be limited to, whether or not the international participation may require the prospective proposer to obtain the prior approval of the Department of State or the Department of Commerce via a technical assistance agreement or an export license, or whether a license exemption/exception may apply. If prior approvals via licenses are necessary, the Phase A Concept Study Report must discuss whether the license has been applied for or, if not, the projected timing of the application and any implications for the schedule. Information regarding U.S. export regulations is available at the World Wide Web addresses http://www.pmdtc.org/ and http://www.bxa.doc.gov/. Prospective proposers are advised that under U.S. law and regulation, spacecraft and their specifically designed, modified, or configured systems; components; parts; etc., such as the instrumentation being sought under this AO, are generally considered "Defense Articles" on the United States Munitions List and subject to the provisions of the International Traffic in Arms Regulations (ITAR), 22 CFR 120-130, *et seq*.

7. PROPOSAL EVALUATION, SELECTION, AND IMPLEMENTATION

7.1 Evaluation Criteria

The fundamental goal of the evaluation process is to identify scientific ideas and unique theoretical and analytical capabilities that best meet the scientific objectives of the Mars Exploration Rover mission as described in this Announcement. Accordingly, the following criteria will be used in evaluating all proposals submitted in response to this Announcement where their relative weightings are given in parentheses:

- The scientific and technical merit of the proposed investigation and its perceived contribution to the objectives of the mission and relevance to this specific opportunity. (50%)
  Factors determining the scientific and technical merit of a proposal will include the following of equal priority:
  - Demonstration of a clear understanding of the Mars Exploration Rover mission, its instruments, and its scientific and technical capabilities, particularly those related to the proposed investigation.

– The feasibility of the proposed investigation using the Athena science instruments and rover engineering sensors, and the data returned from them, and a clear statement of the instrument data required for the proposed investigation.

– The ability, capability, and commitment of the investigator to participate in planning, collection, reduction, and evaluation of the data to be submitted to the PDS

- The competence and relevant experience of the proposing PI and any proposed support personnel as an indication of their ability to perform the proposed technical tasks and carry the investigation to a successful conclusion. (25%)

- Realism and reasonableness of the total costs and the comparison of these costs to the available funds. Total costs will be considered to include not only those proposed for scientific investigation and science data analysis, but also the impact the proposed investigation may have on space mission operation costs. (15%)

- Management considerations, including demonstrated capability to adhere to sound business practices, and the commitment of the proposing institution, as measured by the willingness of the institution to provide the necessary support (logistics, facilities, etc.) to ensure that the investigation can be satisfactorily completed. (10%)

7.2 Evaluation Procedures

Proposals received in response to this AO will be evaluated in accordance with the provisions of NASA Federal Acquisition Regulations (FAR) Supplement Part 1872, "*Acquisition of Investigations*," that may be accessed through the Internet host http://www.hq.nasa.gov/office/procurement/regs/1872.htm.

All proposals will be subjected to a preliminary screening to determine their suitability and responsiveness to the AO. Proposals that are not in compliance with the constraints, requirements, and guidelines of this AO will be handled as technical correspondence and returned to the proposer without further review. Those proposals that are responsive to the AO will then be subjected to a preliminary technical, management, and cost assessment.

Following these preliminary actions, the scientific and technical aspects of each proposal will be assessed by panels composed of reviewers who are scientific and technical peers of the proposers. The purpose of this peer evaluation will be to determine the scientific and technical merit of each proposal, expressed in terms of major and minor strengths and weaknesses.

7.3 Categorization Process

After all scientific, technical, management, and cost evaluations are completed based on the criteria given in Section 7.1 above, an *ad hoc* Categorization Subcommittee of the Space Science Steering Committee (SScSC; see further below in Section 7.4), consisting of U.S. Civil Servants, will meet to categorize the submitted proposals according to the definitions in NASA FAR Supplement 1872.403, as follows:

> Category I: Well conceived and scientifically and technically sound investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that the data can be properly reduced, analyzed,

interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.

Category II: Well conceived and scientifically and technically sound investigations, which are recommended for acceptance, but at a lower priority than Category I.

Category III: Scientifically or technically sound investigations which require further development. (Note: Category III investigation will not be considered for selection through this AO).

Category IV: Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason.

7.4 Selection Process

Following the evaluations described above, the NASA MER Program Scientist will develop a recommendation for selection based on the available Category I and II proposals, with the approval of the Mars Exploration Program Lead Scientist. This recommendation and all peer review and categorization materials for all proposals will be presented to the Space Science Steering Committee, composed of Civil Service personnel appointed by the Associate Administrator for Space Science, for an independent review of the evaluation and categorization processes and records. After this review, the final evaluation results will be forwarded to the Associate Administrator, who will make the selections. These selections will be final; no Accommodation Phase or Science Confirmation Review is planned for these investigations.

7.5 Implementation Procedures

Following the selection, the PI's of the selected investigations will be notified immediately by telephone, followed by formal written notification. Proposers of investigations that were not selected will be notified in writing and offered an oral debriefing. This debriefing is expected to be by telephone but may be in person at NASA Headquarters under the restriction that NASA funds may not be used to offset any travel costs.

8. SCHEDULE

The following schedule applies to this Announcement of Opportunity:

AO release .....August 29, 2001
Notice of Intent due .....September 28, 2001
Proposal due by 4:30 p.m. EST .....December 5, 2001
Non-U.S. Letters of Endorsement due.....January 4, 2002
Selections announced (target).....March 2002

9. CONCLUSION

The Mars Exploration Rover mission represents the next opportunity for landed rover operations on Mars and provides an opportunity to execute science investigations at the forefront of planetary science, as well as generate opportunities to enhance education initiatives and engage the public in the excitement of science discoveries. NASA invites both the U.S. and international science communities to participate in

proposals for MER Science Team membership as Participating Scientists to be selected through this Announcement.

Edward J. Weiler
Associate Administrator
for Space Science

APPENDIX A

GENERAL INSTRUCTIONS AND PROVISIONS

I. INSTRUMENTATION AND/OR GROUND EQUIPMENT

By submitting a proposal, the investigator and institution agree that NASA has the option to accept all or part of the offeror's plan to provide the instrumentation or ground support equipment required for the investigation, or NASA may furnish or obtain such instrumentation or equipment from any other source as determined by the selecting official. In addition, NASA reserves the right to require use of Government instrumentation or property that subsequently becomes available, with or without modification, that meets the investigative objectives.

NOTICE TO ALL OFFERORS: In the event that a Principal Investigator (PI) employed by NASA is selected under this Announcement of Opportunity (AO), NASA will award prime contracts to non-Government participants, including Co-Investigators (Co-I's), hardware fabricators, and service providers, who are named members of the proposing team, as long as the selecting official specifically designates the participant(s) in the selection decision. Refer to Section I of Appendix B of this AO for proposal information which the selecting official will review in determining whether to incorporate a non-Government participant in the selection decision. Each NASA contract with hardware fabricators and service providers selected in this manner will be supported by an appropriate justification for other than full and open competition, as necessary.

II. TENTATIVE SELECTIONS, PHASED DEVELOPMENT, PARTIAL SELECTIONS, AND PARTICIPATION WITH OTHERS

By submitting a proposal, the investigator and the organization agree that NASA has the option to make a tentative selection pending a successful feasibility or definition effort. NASA has the option to contract in phases for a proposed experiment, and to discontinue the investigative effort at the completion of any phase. NASA may desire to select only a portion of the proposed investigation and/or that the individual participates with other investigators in a joint investigation. In this case, the investigator will be given the opportunity to accept or decline such partial acceptance or participation with other investigators prior to a NASA selection. Where participation with other investigators as a team is agreed to, one of the team members will normally be designated as its leader or contact point. NASA reserves the right not to make an award or to cancel this AO at any time.

III. SELECTION WITHOUT DISCUSSION

The Government reserves the right to reject any or all proposals received in response to this AO when such action shall be considered in the best interest of the Government. Notice is also given of the possibility that any selection may be made without discussion (other than discussions conducted for the purpose of minor clarification). It is therefore emphasized that all proposals should be submitted initially on the most favorable terms that the offerer can submit.

IV. FOREIGN PROPOSALS

The guidelines for proposals originating outside of the United States are the same as those for proposals originating within the United States, except that the additional conditions described in Sections 6.7 shall also apply.

V. TREATMENT OF PROPOSAL DATA

It is NASA policy to use information contained in proposals and quotations for evaluation purposes only. While this policy does not require that the proposal or quotation bear a restrictive notice, offerors or quoters should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following notice on the title page of the proposal or quotation and specify the information, subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information (data) contained in proposals and quotations will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice. To prevent inadvertent disclosure, proposal data shall not be included in submissions (e.g., final reports) that are routinely released to the public.

RESTRICTION ON USE AND DISCLOSURE OF
PROPOSAL AND QUOTATION INFORMATION (DATA)

> The information (data) contained in (insert page numbers or other identification) of this proposal or quotation constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed for other than evaluation purposes; provided, however, that in the event a contract is awarded on the basis of this proposal or quotation, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract. This restriction does not limit the Government's right to use or disclose this information (data), if obtained from another source without restriction.

VI. STATUS OF COST PROPOSALS (U.S. PROPOSALS ONLY)

The investigator's institution agrees that the cost proposal is for proposal evaluation and selection purposes, and that following selection and during negotiations leading to a definitive contract, the institution may be required to resubmit cost information in accordance with FAR 15.403-5.

VII. LATE PROPOSALS

Proposals or proposal modifications received after the latest date specified for receipt may be considered if a significant reduction in cost to the Government is probable or if there are significant technical advantages, as compared to proposals previously received.

VIII. SOURCE OF SPACE INVESTIGATIONS

Investigators are advised that candidate investigations for space missions can come from many sources. These sources include those selected through the AO, those generated by NASA in-house research and development, and those derived from contracts and other agreements between NASA and external entities.

IX. DISCLOSURE OF PROPOSALS OUTSIDE THE GOVERNMENT

NASA may find it necessary to obtain proposal evaluation assistance outside the Government. Where NASA determines it is necessary to disclose a proposal outside the Government for evaluation purposes, arrangements will be made with the evaluator for appropriate handling of the proposal information.

Therefore, by submitting a proposal, the investigator and institution agree that NASA may have the proposal evaluated outside the Government. If the investigator or institution desires to preclude NASA from using an outside evaluation, the investigator or institution should so indicate on the cover. However, notice is given that if NASA is precluded from using outside evaluation, it may be unable to consider the proposal.

X. EQUAL OPPORTUNITY (U.S. PROPOSALS ONLY)

For any NASA contract resulting from this solicitation, the clause at FAR 52.222-26, Equal Opportunity, shall apply.

XI. PATENT RIGHTS

- For any NASA contract resulting from this solicitation awarded to other than a small business firm or nonprofit organization, the clause at NFS 18-52.227-70, New Technology, shall apply. Such contractors may, in advance of a contract, request waiver of rights as set forth in the provision at NFS 18-52.227-71, Requests for Waiver of Rights to Inventions.

- For any NASA contract resulting from this solicitation awarded to a small business firm or nonprofit organization, the clause at FAR 52.227-11, Patent Rights – Retention by the Contractor (Short Form) (as modified by NFS 18-52.227-11), shall apply.

XII. RIGHTS IN DATA

Any contract resulting from this solicitation will contain the Rights in Data – General clause: FAR 52.227-14.

XIII. SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING

- (a) Offerors are advised that, in keeping with Congressionally mandated goals, NASA seeks to place a fair portion of its contract dollars, where feasible, with Small Disadvantaged Business (SDB) concerns, Women-Owned Small Business (WOSB) concerns, Historically Black Colleges and Universities (HBCU's), and other Minority Educational Institutions (MEI's), as these entities are defined in 52.219-8 and in 52.226-2 of the FAR.

  (b) Offerors are advised that for NASA contracts resulting from this solicitation which offer subcontracting possibilities, exceed $500,000, and are with organizations other than small business concerns, the clause FAR 52.219-9 shall apply. Offerors whose investigations are selected for implementation leading to flight will be required to negotiate subcontracting plans which include subcontracting goals for small, small disadvantaged, women-owned, and Historically Underutilized Business Zone (HUBZone) small business concerns. Note that these specific subcontracting goals need not be submitted with the proposal. Failure to submit and negotiate a subcontracting plan after the Phase II selection shall make the offeror ineligible for award.

APPENDIX B

GUIDELINES FOR PROPOSAL PREPARATION

The following guidelines apply to the preparation of proposals in response to this Announcement of Opportunity (AO). The material presented is a guide for the prospective proposer and is not intended to be all encompassing. The proposer must, however, provide information relative to those items applicable, as well as other items required by the AO. In the event of an apparent conflict between the guidelines in this Appendix and those contained within the body of the AO, those within the AO shall take precedence.

1. GENERAL GUIDELINES

All documents must be typewritten in English, use metric and standard astronomical units, and be clearly legible. Submission of proposal material by facsimile (fax), electronic media, videotape, or floppy disk is not acceptable. In evaluating proposals, NASA will only consider printed material in the submitted proposal. A proposal may not reference an Internet site for any data or material necessary for completeness of the proposal.

The proposal must consist of only one volume, with readily identified sections corresponding to items given in Section 3 below. Note the guidance on page count for the various sections specified in Table B-1.

In order to allow for recycling of proposals after the review process, all proposals and copies must be submitted on plain white paper only (e.g., no cardboard stock or plastic covers, no colored paper, etc.). Proposers are requested not to use three-ring binders. Photographs and color figures are permitted if printed on recyclable white paper only. The original signed copy (including Cover Page, certifications, and non-U.S. endorsements) should be bound in a manner that makes it easy to disassemble for reproduction. Except for the original, two-sided copies are preferred. Every side upon which printing appears will be counted against the page limits.

In all proposals, a science investigation, including data analysis and publication of results, must be clearly defined. The proposal should also contain the best possible description of the proposer's plans for data processing, management, and archiving, all as appropriate. Some of the details of the MER program data management procedures are not established at this time, but the proposal should include as much information as possible concerning the investigator's plans, requirements, and costs, especially those for unique data management requirements (hardware and software).

2. PAGE LIMITS

While there is no limit on the total size of the proposal, there are limits on the sizes of several key components as given in Table B-1. Proposals may contain fold-out pages up to a size of 11 x 17 inches (28 x 43 cm), but such fold-out pages count as two pages for each printed side against the page limit. All pages other than fold out pages shall be 8.5 x 11 inches or A4 European standard.

Table B-1: Page Limits for Proposals

Section	Page Limits
Cover Page/Investigation Summary	Printed from web site http://props.oss.hq.nasa.gov
Table of Contents	1
Investigation and Technical Plan	15
References	No limit
Resume, Relevant Experience, Curriculum Vitae	3
Statement of E/PO Commitment/Ideas	1
Management and Cost Plan	No limit

Single- or double-column format is acceptable. In complying with the page limit, no page should contain more than 55 lines of text and the type font should not be smaller than 12-point (i.e., approximately 15 characters per inch). Figure captions should be in 12 point. Figures and cost tables may contain smaller font as long as they are easily legible.

3. CONTENTS OF PROPOSALS

3.1 Cover Page/Investigation Summary

A *Cover Page/Proposal Summary* is an integral part of the proposal and is generated by accessing the Web site located at http://props.oss.hq.nasa.gov and filling in the requested information. It is then both printed out in hard copy for submission with the proposal, as well as submitted electronically to that Web site. The *Cover Page* form requires the full names of the Principal Investigator (PI) and the authorizing institutional official, their addresses with zip code, telephone and fax numbers, and electronic mail addresses, as well as the names, institutions, and E-mail addresses of all participants, and the total NASA Office of Space Science (OSS) Cost. The *Proposal Summary* form provides the equivalent of about one-half page of space for a brief description of the intended science investigation, as well as a brief statement of the objectives for Education/Public Outreach. Note that NASA enters the Summaries of all investigations selected for its various programs into a publicly accessible database. Therefore, the *Proposal Summary* should not contain any proprietary or confidential information that the submitter wishes to protect from public disclosure.

Proposers must not reformat this *Cover Page/Proposal Summary* after it is printed, since the information thereon is automatically entered into NASA's main data base for the proposal. This form may be accessed for editing of submitted material up to the time of the proposal submission deadline by following the instructions at this Web site. Proposers without access to the Web or who experience difficulty in using this site may contact the Help Desk by E-mail at dtripp@hq.nasa.gov for assistance. Finally, note that submission of the electronic *Cover Page/Proposal Summary* does not satisfy the deadline for proposal submission.

The printed copy of this *Cover Page* that is submitted with the proposal must be signed by the PI and the official of the investigator's organization who is authorized to commit the organization to the completion of the investigation should it be selected. This authorizing signature now also certifies that the proposing institution has read and is in compliance with the three required certifications printed in full in Appendix C of this AO; therefore, these certifications do not need to be submitted separately.

3.2 Table of Contents

The proposal must contain a Table of Contents that parallels the outline provided below in Sections 3.1 through 3.7

3.3 Investigation and Technical Plan

The description of the proposed investigation must include the scientific objectives, a clear specification of the data needed in order to accomplish those objectives, any operational constraints that might be required to take the data, how the data will be analyzed, and how the data products will be used to achieve the scientific objectives.

1. Scientific Goals and Objectives. This section must consist of a discussion of the goals and objectives of the investigation and the value of the investigation to the scientific objectives as stated in this AO. It must describe the history and basis for the proposal and must discuss the need for such an investigation.

2. Data Requirements. Discuss measurements to be taken in the course of the mission, the data to be returned, and the approach that will be taken in analyzing the data to achieve the scientific objectives of the investigation. This description must identify the quality of the data to be returned (resolution, coverage, pointing accuracy, measurement precision, etc.), as well as the quantity of data needed (bits, etc.) for the proposed investigation. The relationship between the data products generated and the scientific objectives must be explicitly described, as must the expected results. Finally, the plan for producing and delivering data to the Planetary Data System must be described.

3. Mission Requirements. This section must describe expected requirements and constraints on the operation of the mission as the data are acquired. The relationship between the proposed scientific objectives, the data required to achieve those objectives, and the instrument performance and mission operations needed to obtain those data must be quantitatively presented in the proposal in a clear and unambiguous way.

3.4 References

This section must provide a list of reference documents and/or articles cited in the Investigation and Technical Plan. The references themselves cannot be submitted except as a part of the proposal and included within the prescribed page count.

3.5 Resume, Relevant Experience, Curriculum Vitae

This section must describe the capabilities of the Principal Investigator and any other named personnel for carrying out the proposed investigation. A summary of relevant experience must be included, along with a short version of investigator's curriculum vitae. Proposers should be sure to describe the skills and relevant experience being offered in support of the special needs for the Mars Exploration Rover instruments and surface operations.

3.6 Statement of Commitment for Education/Public Outreach

Every proposal must include a statement of commitment that the Principal Investigator understands and intends to participate in and contribute the Mars Exploration Education and Public Outreach program as planned and executed by the JPL Mars Program Office. As noted in Section 1.5 of this AO, Participating Scientists will be expected to spend approximately 5% of their time on MEP E/PO activities. In addition, proposers should suggest ideas for E/PO activities of either a national or regional nature that he/she thinks would be particularly worthwhile and/or unique.

3.7 Management and Cost Plan

(a) Management Plan.

The management plan should summarize the management approach for the proposed PS investigations, including any required facilities and equipment required.

(b) Cost Plan (U.S. Investigations Only)

The cost plan should summarize the total investigation cost by major categories of cost as well as by function for each Fiscal Year from FY02 through FY05.

The categories of cost should include the following for each Fiscal Year (assuming selection begins April 2002 and ends September 31, 2005):

(i) Direct Labor -- List by labor category, with labor hours and rates for each. Provide actual salaries of all personnel and the percentage of time each individual will devote to the effort.

(ii) Overhead -- Include indirect costs. Usually this is in the form of a percentage of the direct labor costs.

(iii) Materials -- This should give the total cost of the bill of materials including estimated cost of each major item. Include lead time of critical items.

(iv) Subcontracts -- List those over $25,000, specify the vendor and the basis for estimated costs. Include any baseline or supporting studies.

(v) Special Equipment -- Include a list of special equipment with lead and/or development time.

(vi) Travel -- List estimated number of trips, destinations, duration, purpose, number of travelers, and anticipated dates.

(vii) E/PO -- Budget provisions (time and travel) for participating in the Mars Exploration E/PO Program and carrying out local and regional E/PO activities.

(viii) Other Costs -- Costs not covered elsewhere.

(ix) General and Administrative Expense -- This includes the expenses of the institution's general and executive offices and other miscellaneous expenses related to the overall business.

(x) Fee (if applicable).

Separate schedules and/or narrative must should be attached to show how these costs are allocable to the following category of activities:

(i) Principal Investigator costs for pre-mission and mission operations activities.

(ii) Data reduction and analysis including the amount and cost of computer time.

(iii) Education and public outreach activities.

In addition to the costs to NASA described using the budget categories above, the budget must include an evaluation of goods and services offered at no cost to NASA.

APPENDIX C

REQUIRED CERTIFICATIONS

All proposals requesting NASA funding must demonstrate compliance with the policies set forth in the following certifications and assurances. Note that this information is supplied in this Appendix only for reference; the authorizing institutional signature on the Cover Page form (see Appendix B) certifies that the submitting institution has read and is in compliance with these policies.

1. Certification Regarding Debarment, Suspension, And Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 14 CFR Part 1265, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Certification Regarding Lobbying

No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

3. Assurance Of Compliance With The NASA Regulations Pursuant To Nondiscrimination In Federally Assisted Programs

The "Applicant"

HEREBY AGREES THAT it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1972 (20U.S.C. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and the Age Discrimination Act of 1975 (42 U.S.C. 16101 et seq.) and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250)(hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and HEREBY GIVES ASSURANCE THAT it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of which federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contract, property, discounts or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installation payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognizes and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign on behalf of the Applicant.