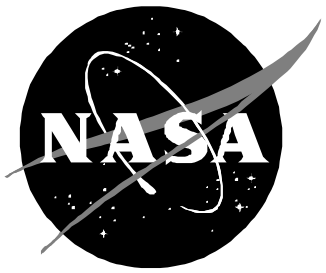

National Aeronautics and Space Administration

September 10, 1999
AO 99-OSS-04

Announcement of Opportunity

Deep Space Systems Program Including Europa Orbiter Pluto-Kuiper Express And Solar Probe

IMPORTANT NOTICE

This Announcement of Opportunity is subject to uncertainties in the current budget considerations before Congress. Therefore all dates, including proposal submission dates, are subject to change and there is the possibility that this Announcement may be rescinded. Further information will be posted as soon as the situation is clarified.

	Notices of Intent due	Proposals due
Europa Orbiter	October 10, 1999	December 10, 1999
Pluto-Kuiper Express	January 9, 2000	March 9, 2000
Solar Probe	April 6, 2000	June 6, 2000

OMB Approval No. 2700-0085

Deep Space System Program
Including
Europa Orbiter,
Pluto-Kuiper Express,
and
Solar Probe

Announcement of Opportunity
Soliciting Proposals
for Basic Research in Space Science

AO 99-OSS-04
Issued: September 10, 1999

Preproposal Conference October 28, 1999

	Notices of Intent due	Proposals due
Europa Orbiter	October 10, 1999	December 10, 1999
Pluto-Kuiper Express	January 9, 2000	March 9, 2000
Solar Probe	April 6, 2000	June 6, 2000

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

DEEP SPACE SYSTEMS PROGRAM
ANNOUNCEMENT OF OPPORTUNITY

TABLE OF CONTENTS

ANNOUNCEMENT OF OPPORTUNITY

DEEP SPACE SYSTEMS PROGRAM

1. Description of Opportunity

1.1 Introduction

The National Aeronautics and Space Administration's (NASA) Office of Space Science (OSS) announces the opportunity to conduct scientific investigations as part of NASA's Deep Space Systems Program. This Announcement of Opportunity (AO) solicits scientific investigations for the first three missions in this program: Europa Orbiter, Pluto-Kuiper Express, and Solar Probe.

In particular, through this AO NASA will accept proposals for scientific investigations that would:

1) Develop and use Europa Orbiter scientific instrumentation;
2) Develop and use Pluto-Kuiper Express remote sensing instrumentation;
3) Develop and use Pluto-Kuiper Express radio science instrumentation;
4) Develop and use Solar Probe remote sensing instrumentation; and
5) Develop and use Solar Probe *in situ* sensing instrumentation.

Through this AO, NASA will also accept proposals for scientific investigations performed as part of Europa Orbiter facility science teams that would:

6) Use data on the Europa gravity field derived from Doppler tracking; and
7) Use data from a possible facility radar instrument.

Finally, through this AO, NASA will also accept proposals for scientific investigations that would:

8) Develop and use other space flight scientific instrumentation for Pluto-Kuiper Express or Solar Probe.

Proposals will be accepted in a staggered series of due dates, starting with the proposals for Europa Orbiter, followed by proposals for the Pluto-Kuiper Express and then for Solar Probe (see Section 1.3 below).

Requirements and guidelines that apply to all proposals submitted in response to this AO are contained in the body of this AO, in Appendix A, entitled "General Instructions and Guidelines," and in Appendix F, entitled "Education/Public Outreach Proposals as Part of Proposals to the Deep Space Systems Program." For each mission there is an additional "Guidelines for Proposal Preparation" appendix, which is slightly different from mission to mission (Appendix B for Europa Orbiter, Appendix C for Pluto-Kuiper Express, and Appendix D for Solar Probe). Mission and Project Description documents, that gives mission-specific requirements can be found in the on-line Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The Deep Space Systems Program Library also contains documents with technical data, scientific summaries, and links to procurement regulations; Appendix E of this AO lists the contents of the Deep Space Systems Program Library.

1.2 Background

In order to achieve the highest possible synergy and reduce cost, the first three missions in the Program are being implemented as a single project called the Outer Planets/Solar Probe Project, managed at the Jet Propulsion Laboratory (JPL). Although ultimately targeted for three very different destinations, all three missions will travel past Jupiter. The three spacecraft will, therefore, potentially share a common suite of avionics, along with certain telecommunications and propulsion components. Core software may also be common, including the software controlling common spacecraft functions, and all three missions will be operated during their long cruise periods by a single project team.

Most of the common components of these missions are being developed and qualified by the Deep Space System Technology Program's X2000 First Delivery Project at JPL. Components developed in the X2000 First Delivery Project will also be available, through the common Deep Space Systems Program, to selected instrument development investigators. A description of these available components can be found in the Deep Space Systems Program Library, available through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

Some aspects of the three missions are clearly unique, most notably the science and instrumentation, trajectories, thermal shielding for Solar Probe, and propulsion and radiation shielding for the Europa Orbiter. Launch systems will also differ depending on availability and performance. In spite of these differences, a single team will: 1) complete preliminary design of the three flight systems, 2) design the trajectories and mission maneuvers, and 3) manage the preparation of the launch systems for all three missions. As each mission in turn enters detailed design, a dedicated mission implementation team will be formed. Members of the selected science investigation teams are expected to become part of the flight system and mission/trajectory design teams. After launch, a single, unified flight operations team will operate the flight system.

1.3 Schedule

Announcement of Opportunity release	September 10, 1999
Preproposal conference	October 28, 1999

Europa Orbiter

Notice of Intent to propose due	October 10, 1999
Proposal submittal due by 4:30 pm Central Time	December 10, 1999
Letters of endorsement for non-U.S. participation due	January 10, 2000
Announcement of Selections (target)	March 2000
Award of funding (target)	April 2000

Pluto-Kuiper Express

Notice of Intent to propose due	January 9, 2000
Proposal submittal due by 4:30 pm Central Time	March 9, 2000
Letters of endorsement for non-U.S. participation due	April 10, 2000
Announcement of Selections (target)	June 2000
Award of funding (target)	July 2000

Solar Probe

Notice of Intent to propose due	April 6, 2000
Proposal submittal due by 4:30 pm Eastern Time	June 6, 2000
Letters of endorsement for non-U.S. participation due	July 6, 2000
Announcement of Selections (target)	September 2000
Award of funding (target)	October 2000

(Proposals are due at 4:30 pm local time at the address given in the appropriate, mission specific Guidelines for Proposal Preparation appendix to this AO. For the Europa Orbiter and Pluto-Kuiper Express opportunities, this address is in the Central Time zone while for Solar Probe opportunity, the address is in the Eastern Time zone.)

1.4 Relationship to Other Opportunities

As each mission approaches its prime mission target, NASA expects to seek additional scientific investigators through separate AO's and/or NASA Research Announcements. Furthermore, scientific data from each mission will be made available to the scientific community for research through other programs. Pending approval of the Deep Space Systems Program, NASA anticipates that it will continue to define new missions to Jupiter and beyond, for which NASA will issue further AO's.

For the Solar Probe mission, NASA plans to issue an announcement soliciting participation as a member of a separate Science Steering Team that will monitor and review emerging, new technologies that might be applied to the scientific investigations selected through this AO.

2. Program Constraints, Requirements, and Guidelines

2.1 General Program Constraints and Guidelines

Every organization submitting a proposal in response to this AO must designate a single *Principal Investigator* (PI) who will be responsible for the quality and direction of the entire proposed investigation and for the use of all awarded funds. Note that NASA does not accept the designation of a "Co-Principal Investigator;" there must be only one PI who is solely responsible for an investigation.

For proposals offering to develop and use space-flight scientific instrumentation, NASA strongly encourages proposers to identify only the most critically important personnel to aid in the execution of their proposals. Should such personnel be required, *Co-Investigators* (Co-I's) may be identified who are critical for the successful completion of an investigation through the contribution of unique expertise and/or capabilities, and who serve under the direction of the PI whether or not they receive compensation directly under the award. A Co-I must have a well-defined role in the investigation that is explicitly defined in the Management section of the proposal (see Section 3.6 of the appropriate Guidelines for Proposal Preparation appendix). In addition, for all proposals submitted in response to this AO, evidence of the commitment of a Co-I to participate in the proposed investigation is now required by way of a brief letter from him/her even if he/she is from the same institution as the PI (see Section 3.9 of the appropriate Guidelines for Proposal Preparation appendix).

Proposals offering to develop and use space-flight scientific instrumentation may also identify as *collaborators* individuals who are less critical to the overall proposal than a Co-I but who are committed to provide a focused although unfunded contribution to a specific task. As for Co-I's noted above, proposals submitted in response to this AO must include a brief letter of commitment from each Collaborator that describes his/her specific, intended contribution to the investigation.

For proposals offering investigations to be performed as part of Europa Orbiter Facility Science Teams, the PI is the only person the proposal may offer as an investigator. While the PI's of Science Team Member investigations may propose additional staff to help them fulfill their responsibilities in performing the investigation, Co-Investigators are not allowed on Science Team Member proposals. Investigators proposing to be members of either of the two Europa Orbiter Science Teams may, as part of their proposal, also propose to serve as the Team Leader. NASA will choose a Team Leader for each of these two Europa Orbiter Science Teams.

For all types of proposals, additional constraints and guidelines for each mission can be found in its mission-specific appendices of this AO (Appendix B for Europa Orbiter, Appendix C for Pluto-Kuiper Express, and Appendix D for Solar Probe).

For the Europa Orbiter mission, NASA anticipates selecting:

- Approximately six Science Team Member investigations to use data on the gravity field of Europa; and
- One Europa Orbiter investigation, the completion of which will require the development and use of remote sensing and possibly other flight instrumentation.

NASA is considering the inclusion of an ice penetrating radar sounder as a facility instrument on the Europa Orbiter mission. Therefore, proposals for Science Team Member investigations to use a facility radar sounder are solicited by this AO. The range of expertise sought for these investigations is outlined in Section 4.3.3, below.

The decision to include a radar sounder will depend partly on the scientific merit and technical feasibility of Science Team Member investigations proposed for this instrument and partly on the capabilities of the remote sensing investigations that are offered. If NASA decides not to include a radar sounder, then none of the Science Team Member investigations for this instrument will be selected. If a radar sounder is included, then NASA anticipates selecting:

- Approximately six Science Team Member investigations to use the facility radar instrument.

If NASA decides to include an ice penetrating radar sounder on the Europa Orbiter mission, this instrument will be developed by the Project through a consortium and will be operated as a facility. Therefore, independent radar instrument designs are not solicited by this AO, nor should a radar instrument be included in a remote sensing investigation proposal.

For the Pluto-Kuiper Express mission, NASA anticipates selecting two scientific investigations, the completion of which will require the development and use of flight instrumentation--one each for:

- Pluto-Kuiper Express remote sensing; and
- Pluto-Kuiper Express radio science.

For the Solar Probe mission, NASA anticipates selecting two scientific investigations, the completion of which will require the development and use of flight instrumentation--one each for:

- Solar Probe remote sensing; and
- Solar Probe *in situ* sensing.

For each mission, NASA anticipates that the instrumentation developed by the selected investigations will be "complete packages" as defined in Section 3 of the appropriate Guidelines for Proposal Preparation appendix. NASA may also select additional investigations that require the development and use of flight instrumentation. No mission resources, however, are specifically set aside for proposals for additional flight instrumentation, although the resources required to support the proposed Europa Orbiter facility radar instrument are open to use by competing investigation proposals
that address the Group 1 Europa science objectives defined in Section 2.3.1 below. Nonetheless, proposals addressing high-priority science with flight instrumentation that is not available to NASA through the other proposed instrument packages will be accepted and evaluated for possible selection. Guidelines for expressing resource requirements are given in Section 3.3 of the appropriate Guidelines for Proposal Preparation appendix.

2.2 Caveats and Baseline for Preparing Proposals

The Deep Space Systems Program is still in its formative stage, so proposers should expect that evolution will occur in response to changes in the fiscal climate, technology developments, and personnel. Moreover, NASA has not yet endorsed the Project Plan on which this AO is based. Nonetheless, schedule requirements and budget guidelines presented in this AO are to be used as the basis for the preparation and evaluation of all proposals.

2.3 Science Requirements

The NASA Science Definition Teams for each mission carefully considered the range of science objectives appropriate for their missions and prioritized them. These objectives have been endorsed by the appropriate Subcommittees of NASA's Space Science Advisory Committee and will serve as the basis for the evaluation of scientific merit of proposed investigations. Group 1 objectives, as given below, have the highest priority and are considered of equal priority within that group. Other objectives are listed in successive groups, in order of descending priority. Group 2 objectives are considered important but not of the highest priority while Group 3 are considered to be desirable but of lesser importance. NASA is seeking investigations that can best address these objectives within the budget allowed for these investigations; all proposals must address at least one of the Group 1 objectives.

In addition to prioritized science objectives, the Science Definition Teams also defined measurement objectives that serve as a guide for proposers offering to meet the Group 1 objectives. Other techniques may be proposed. A summary based on each Science Definition Team's measurement objectives and a general description of the strawman instrument set considered can be found in the appropriate Mission and Project Description document, available through the on-line, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

2.3.1 Europa Orbiter Science Objectives

Group 1 Objectives:

- Determine the presence or absence of a subsurface ocean;
- Characterize the three-dimensional distribution of any subsurface liquid water and its overlying ice layers; and
- Understand the formation of surface features, including sites of recent or current activity, and identify candidate landing sites for future lander missions.

Group 2 Objectives:

- Characterize the surface composition, especially compounds of interest to prebiotic chemistry;
- Map the distribution of important constituents on the surface; and
- Characterize the radiation environment in order to reduce the uncertainty for future missions, especially landers.

2.3.2 Pluto-Kuiper Express Science Objectives

Group 1 Objectives:

- Characterize the global geology and morphology of Pluto and Charon;
- Map surface composition of Pluto and Charon; and
- Characterize the neutral atmosphere of Pluto and its escape rate.

Group 2 Objectives:

- Characterize the time variability of Pluto's surface and atmosphere;
- Image Pluto and Charon in stereo;
- Map the terminators of Pluto and Charon with high resolution;
- Map the surface composition of selected areas of Pluto and Charon with high resolution;
- Characterize Pluto's ionosphere and solar wind interaction;
- Search for neutral species including H, H_2, HCN, and C_xH_y, and other hydrocarbons and nitriles in Pluto's upper atmosphere, and obtain isotopic discrimination where possible;
- Search for an atmosphere around Charon;
- Determine bolometric Bond albedos for Pluto and Charon; and
- Map the surface temperatures of Pluto and Charon.

Group 3 Objectives:

- Characterize the energetic particle environment of Pluto and Charon;
- Refine bulk parameters (radii, masses, densities) and orbits of Pluto and Charon;
- Search for magnetic fields from Pluto and Charon; and
- Search for additional satellites and rings.

2.3.3 Solar Probe Science Objectives

Group 1 Objectives

- Determine the acceleration processes and find the source regions of the fast and slow solar wind at maximum and minimum solar activity;
- Locate the source and trace the flow of energy that heats the corona;
- Construct the three-dimensional coronal density configuration from pole to pole and determine the subsurface flow pattern, the structure of the polar magnetic field, and their relationship with the overlying corona; and
- Identify the acceleration mechanisms and locate the source regions of energetic particles, and determine the role of plasma waves and turbulence in the production of solar wind and energetic particles.

Group 2 Objectives:

- Investigate dust rings and particulates in the near-Sun environment;
- Determine the outflow of atoms from the Sun and their relationship to the solar wind; and
- Establish the relationship between remote sensing, near-Earth observations at 1 AU and plasma structures near the Sun.

Group 3 Objectives:

- Determine the role of x-ray microflares in the dynamics of the corona; and
- Probe nuclear processes near the solar surface from measurements of solar gamma rays and slow neutrons.

2.4 Formation of Integrated Implementation Teams

PI's of selected instrument investigations and the person on each PI's team responsible for the instrument development effort will become members of an Integrated Implementation Team for their respective mission. The primary interfaces each PI's team will have with their mission's Integrated Implementation Team are described in the appropriate Mission and

Project Description document, available through the Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

PI's of selected Europa Orbiter Science Team Member investigations will participate primarily through the Science Teams for which they were selected. The selected Europa Orbiter Team Leaders will lead the Science Teams and represent the Science Teams on the Europa Orbiter Integrated Implementation Team.

Throughout the entire design, development, launch, cruise, and data gathering phases of the missions, the members of each Integrated Implementation Team will need to be available for frequent, on-line, concurrent working sessions using telephone, video conference, E-mail, and computer-based work group tools. The working environment and other project work requirements are described in the appropriate Mission and Project Description document.

Overall project leadership and coordination for each mission is provided by the Project Manager and the Project Office staff. Each mission will have a Project Scientist.

2.5 Data Rights, Use, and Publication

Recognizing the multidisciplinary nature of each of these missions, it is intended that all selected investigations and investigators on a given mission work closely together to integrate the science results. Specifically, this will require teams to work out agreements for joint analysis and rapid sharing of data where appropriate.

The following rules apply to rights, use, and publication of data from the Deep Space Systems Program missions:

1) There is no proprietary period for any data collected by instruments on the Deep Space Systems missions.
2) A portion of the data will be released early as public releases and postings on the World Wide Web or equivalent.
3) Science instrument data are subject to a validation period of no more than six months from the time of acquisition to allow its calibration and formatting. After calibration and formatting, the data from the missions are to be placed in the appropriate repository for access by the scientific community (data from the Europa Orbiter and the Pluto-Kuiper Express are to be deposited in NASA's Planetary Data System while the data from Solar Probe are to be deposited in NASA's National Space Science Data Center). Data in these repositories will contain the appropriate calibration information and ancillary data that will be updated throughout the period of investigation.
4) NASA expects that all investigators selected through this AO will publish their results in a timely manner in the open scientific literature.

2.6 Education/Public Outreach

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 all levels (with a particular emphasis on K-14 education) and the enhancement of public understanding of space science integral parts of all of its missions and research programs. 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 Education and Public Outreach Into NASA's Space Science Programs* (March 1995), and an accompanying implementation plan entitled *Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy* (1996). Both can be accessed by selecting "Education and Outreach" from the menu on the OSS homepage at Internet URL http://spacescience.nasa.gov, or from Dr. Jeffrey Rosendhal, Office of Space Science, Code S, NASA Headquarters, Washington, DC 20546-0001, USA.

In accord with these established OSS policies, Education and Public Outreach (E/PO) will be an integral element of the Deep Space Systems Program, and 1-2% of the total program budget will be allocated to education and outreach. All selected, NASA-funded, scientific participants will be expected to become actively involved in planning and implementing an E/PO program.

The approach being taken to involving scientists in the Deep Space Systems Program in E/PO has been specifically tailored to recognize that, in general, there are two broad classes of scientific participants whose investigations will be of very different scientific and financial scope. Expectations concerning the nature of participation in E/PO for these two classes of scientific investigations are different.

1) Instrument investigations are required to include an E/PO component as a part of their overall proposal. OSS expects that a substantive education/outreach program will be an integral element of the investigation and that proposers will devote adequate resources to the planning and implementation of such an effort. The general funding guidelines for E/PO for the mission as a whole also apply to the E/PO component of instrument investigations. Proposals must include the Principal Investigator's approach for planning an education/outreach program, arranging for appropriate partners and alliances, implementing the education/outreach program (including appropriate evaluation activities), and plans for disseminating education/outreach products and materials. See Appendix F for further information on expected proposal content. The E/PO components of proposals will be evaluated by appropriately qualified scientific, education, and outreach personnel, and those evaluations will be considered by the Selecting Official as part of the overall selection process. Section 4

contains further information on the proposal evaluation and selection process and the role of E/PO in that selection process. As indicated in that section, E/PO will not be considered as part of the Categorization process--which will be based entirely on the scientific and technical merits of the proposal--but as one of the other factors to be considered in evaluating the merits of closely competing proposals in subsequent stages of the selection process.

2) Science Team Member investigations will be expected to include partication in the common Deep Space Systems Program Education/Public Outreach program (see below) that is now being defined. OSS expects that individual participating scientists (including members of their supporting team) must be prepared to spend an average of approximately 5% of their time, as part of their normal ongoing work, supporting Education/Public Outreach activities. Such activities may include, but not be limited to: 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 educational and public outreach materials. Science Team Member 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.

Specific instructions for including proposals for Education/Public Outreach efforts can be found in the appropriate Guidelines for Proposal Preparation appendix and in Appendix F. Other important information concerning the expected content of E/PO proposals, the evaluation criteria to be used to rate proposals, and assistance available from the OSS Education/Outreach "Ecosystem" can be found in Appendix F.

It should be noted that, in addition to their individual E/PO programs, selected, NASA-funded instrument investigator teams (together with Science Team Members) will be expected to become actively involved in creating, designing, planning, and implementing a Education/Public Outreach program to be carried out by the common Deep Space Systems Program. Several steps will be taken after selection to define, ensure and enable active participation in one common program and to coordinate and integrate unique instrument investigator E/PO programs into the overall program. These include planning workshops that will focus on ways to fulfill NASA's education and outreach objectives, to encourage the flow of creative ideas, to inspire innovative approaches, and to define and implement an integrated E/PO program. Components will be integrated through a variety of collaborative processes designed to produce a consensus for one overall Education/Public Outreach Plan that will meet NASA's and OSS's education and outreach objectives.

2.7 Schedule and Cost Requirements

2.7.1 Schedule Requirements

Proposals must specify periods of performance extending from the expected selection date through the end of analysis, using the following nominal dates for key milestones:

Europa Orbiter
Launch ..... November 2003
Jupiter Orbit Insertion ..... August 2006
Europa Orbit Insertion ..... May 2008
End of analysis ..... June 30, 2009

Pluto-Kuiper Express
Launch ..... December 2004
Fly by Jupiter ..... March 2006
Fly by Pluto ..... December 2012
End of analysis ..... June 30, 2014

Solar Probe
Launch ..... February 2007
Fly by Jupiter ..... June 2008
First flyby of Sun ..... October 2010
Second flyby of Sun ..... January 2015
End of analysis ..... March 31, 2016.

All proposals must include separate budgets for each year, as described in the appropriate Guidelines for Proposal Preparation appendix.

2.7.2 Limitations on Funding

NASA has only a limited amount of funding for the selected investigations. During the evaluation of proposals, reviewers will assess the steps taken to ensure that the cost will remain below the proposed cost. During mission development, cost growth above the limits will be viewed as threatening the success of the mission and may lead to the removal of the investigation team from the mission. Funding guidelines can be found in Section 3.1 of the appropriate Mission and Project Description document, available through the on-line, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

2.7.3 Full Cost Accounting

If a proposal offers NASA-provided services, the proposed budget must include the full cost of Civil Service labor and NASA Center infrastructure support. If NASA guidance for full cost accounting has not been fully developed by the closing date for proposal submission, NASA Centers must submit cost proposals based on the instructions in the NASA Financial Management Manual, Section 9091-5, "Cost Principles for Reimbursable Agreements," or based on their own, Center-approved, full-cost accounting models. Other Federal Government elements of proposals must follow their agency's cost accounting standards for full cost. If no standards are in effect, the proposers must then follow the Managerial Cost Accounting Standards for the Federal Government as recommended by the Federal Accounting Standards Advisory Board.

2.8 International Participation

Recognizing the potential scientific, technical, and financial benefits offered to all partners by international participation, participation by non-U.S. individuals and organizations as Principal Investigators, Co-Investigators, or team members in common Deep Space Systems Program investigations is encouraged. Participation may include, but is not limited to, the contribution of instrument hardware, necessary facilities and services, and the subsequent sharing of data from the mission, all on a no-exchange-of-funds basis.

The direct purchase of goods and/or services from non-U.S. sources is also permitted. Proposers are advised, however, that a contract or subcontract by a U.S. team with a non-U.S. participant using funds derived from NASA must meet NASA and Federal regulations. Proposers are further advised that these regulations will place an additional burden on investigation teams that must be explicitly included in discussions of the investigation's cost, schedule, and risk management. Information regarding regulations governing the procurement of foreign goods or services is provided in the Deep Space Systems Program Library, available through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

Participation by non-U.S. individuals and/or institutions as team members or contributors to common Deep Space Systems Program investigations must be endorsed by the institutions and/or governments involved. If government support is required, then a government endorsement is also needed. The letter of endorsement must provide evidence that the non-U.S. institution and/or government officials are aware and supportive of the proposed investigation and will pursue funding for the investigation if selected by NASA. Such endorsements must be submitted per the appropriate schedule in Section 1.3.

Proposals which include international participation, either through involvement of foreign nationals and/or involvement of foreign entities must include 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. 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 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 through Internet URLs 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, 22 CFR 120-130, *et seq*.

2.9 Reference for Further Information

Questions about this AO in general and questions about the Europa Orbiter and the Pluto-Kuiper Express opportunities in particular may be directed to the NASA Deep Space Systems Program Scientist:

Dr. Jay Bergstralh
Research Program Management Division
Code SR
Office of Space Science
NASA Headquarters
Washington DC 20546-0001
Telephone: (202) 358-0313
E-mail: Jay.Bergstralh@hq.NASA.gov

Questions specifically about the Solar Probe opportunity may be directed to the NASA Solar Probe Program Scientist:

Dr. W. Vernon Jones
Research Program Management Division
Code SR
Office of Space Science
NASA Headquarters
Washington DC 20546-0001
Telephone: (202) 358-0885
E-mail: Vernon.Jones@hq.NASA.gov

A posting of questions and answers will be available at the common Deep Space Systems Program Q&A Site, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

2.10 Preproposal Conference

A preproposal conference covering all three missions will be held at the Lunar and Planetary Institute, 3600 Bay Area Boulevard, Houston, TX, beginning at 8:30 a.m. on the date given in Section 1.3. The conference will begin with a presentation of answers to questions received up to that time about the AO. Following the presentation, the conference will be open to questions from the attendees. Although representatives from NASA and the common Deep Space Systems Program at JPL will attempt to answer the questions at the conference, some questions will have to be researched and answered later. In any case, the answers to questions and a transcript of the conference will be available through the Deep Space Systems Program Library which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. A videotape of the preproposal conference will be sent to each attendee and to anyone who requests a copy.

2.11 Updates to the AO

Any updates to this AO will be posted on the OSS Research Opportunities website, accessible through the OSS Homepage at Internet URL http://spacescience.nasa.gov. It is the responsibility of interested proposers to check this site periodically for pertinent information.

3. Proposal submission information

3.1 Notice of Intent to Propose

NASA strongly encourages all prospective proposers to submit a Notice of Intent in accordance with the schedule in Section 1.3. Proposers must prepare this Notice of Intent in English and submit it electronically following the procedures given in the appropriate Guidelines for Proposal Preparation appendix.

To the extent that the proposer knows the following information by the due date, the Notice of Intent should include:

(a) Names, addresses, telephone numbers, E-mail addresses, and fax numbers of (1) the Principal Investigator; (2) any Co-Investigators; and (3) the lead representative from each organization (industrial, academic, educational, nonprofit, and/or Federal) expected to be included in the proposal team; and

(b) Title of the proposed investigation, an indication of which type of investigation it will be (see Section 1.1), and a brief statement of its expected scientific objectives.

3.2 Format and Content of Proposals

Appendix A contains general NASA guidance for proposals that is binding unless specifically amended in the body of this AO or in the appropriate, mission-specific Guidelines for Proposal Preparation appendix. In order to facilitate evaluation, NASA requires a uniform proposal format for all proposals submitted in response to this AO. The proposal format can be found in the appropriate Guidelines for Proposal Preparation appendix where other, important guidance for preparing proposals is also given. Failure to follow the outline or the page count limits in the appropriate Guidelines for Proposal Preparation appendix may result in reduced ratings during the evaluation process, or in extreme cases, could lead to rejection of the proposal without review.

3.2.1 Certification

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 proposal's cover page. (See details in the appropriate Guidelines for Proposal Preparation appendix.)

3.2.2 Quantity

Proposers must provide 30 copies of their proposal, plus the original signed proposal.

3.2.3 Submittal Address

Proposals must be delivered to the addresses given in the appropriate Guidelines for Proposal Preparation appendix to this AO.

3.2.4 Deadline

The organization at the submittal address must receive all proposals by 4:30 pm, local time, by the closing date specified in Section 1.3. NASA will treat all proposals received after the closing date in accordance with NASA's provisions for late proposals (Appendix A, Section 7).

3.2.5 Notification of Receipt

NASA will notify the 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 address given in the appropriate Guidelines for Proposal Preparation appendix to this AO.

4. Proposal evaluation and Selection

4.1 Evaluation and Selection Process

NASA will subject all proposals submitted in response to this AO to a preliminary screening to determine their compliance to the constraints, requirements, and guidelines of the AO. Proposals not in compliance will be returned without further review.

NASA will consider proposals offering any of the following to be noncompliant:

- Ice penetrating radar for the Europa Orbiter mission;
- Flight hardware as part of a Europa Orbiter Radar Science Team Member proposal or a Europa Orbiter Gravity Science Team Member proposal;
- More than one investigator on a Europa Orbiter Radar Science Team Member proposal or a Europa Orbiter Gravity Science Team Member proposal; or
- Data analysis only on any mission.

Using the criteria given below, the remaining proposals will then be assessed by an evaluation team made up of panels of peers of the proposers in scientific, technical, management, Education/Public Outreach, and other areas. NASA may also seek to supplement the knowledge and expertise of the panels by obtaining mail-in reviews.

As noted in section 2.1 of this AO, NASA is considering the inclusion of an ice penetrating radar sounder as a facility instrument on the Europa Orbiter mission. The process for deciding whether to include this facility instrument as part of the Europa Orbiter payload will follow the same steps as described below, including categorization, for selection of other investigations. The same evaluation criteria will be applied. The evaluations of scientific merit and technical merit will be based partly on the scientific merit and technical feasibility of the Science Team Member investigations proposed for this instrument and partly on the capabilities of the other remote sensing investigations that are offered.

Once the panel evaluations are complete, an *Ad Hoc* Subcommittee of the Space Science Steering Committee (see below), composed wholly of Civil Servants, will convene to consider the evaluation results. This Subcommittee will categorize the proposals in accordance with procedures required by NASA FAR Supplement Part 1872.0 according to the Categories defined below.

Category I. Well conceived and scientifically and technically sound investigation 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 the investigation can be delivered on time and within budget. 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 or technically sound investigations that are recommended for acceptance, but at a lower priority than Category I.

Category III. Scientifically or technically sound investigations that require further development.

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

Following categorization, the JPL common Deep Space Systems Project Office will conduct payload accommodation assessments of those highly ranked proposals that offer to provide flight instrumentation. The Project Office will report its findings from these assessments to the NASA Program Scientist for the selection. The Program Scientist will evaluate these findings and use them in developing recommendations for an integrated science payload that addresses, at a minimum, the Group 1 science objectives for that mission, as described in Section 2.3.

The Space Science Steering Committee, which is composed wholly of NASA Civil Servants and appointed by the Associate Administrator for Space Science, will consider the results of the evaluations and categorizations. The Steering Committee will conduct an independent assessment of the evaluation and categorization processes regarding both their compliance to established policies and practices, as well as their completeness, self-consistency, and adequacy of all materials related thereto.

After this review, the NASA Program Scientist for the selection will submit the final evaluations and categorizations to the Source Selection Official who will make the final selections based on the evaluation factors outlined in Section 4.2 (instrument proposals) and Section 4.3 (Europa Science Team Member proposals), on the E/PO factors described in Section 2 of Appendix F (instrument proposals), and on the cost factors outlined in Section 4.4. The Associate Administrator for Space Science will be the Source Selection Official for this opportunity.

4.2 Criteria for Evaluation of Instrument Investigation Proposals

Compliant proposals offering flight instrumentation as part of the investigation and the proposed Europa ice-penetrating radar facility instrument, will be evaluated for their intrinsic scientific and technical merits, as defined more fully in the subsections below. The evaluation criteria and their percentage weights, given in parentheses, are:

- Scientific Merit and Relevance to Mission Objectives (25);
- Technical Merit and Probability of Success (25);
- Mission Impact (20);
- Cost Risk and Feasibility of Implementation Plan (20); and
- New Technology (10).

4.2.1 Scientific Merit and Relevance to Mission Objectives

The goals and objectives of the proposed investigation will be assessed to determine the intrinsic scientific merit of the proposed investigation and its relevance to the specific opportunity described in this AO. The evaluation will include an assessment of the degree to which the proposal offers to meet the appropriate Group 1 mission science objectives, as a minimum.

4.2.2 Technical Merit and Probability of Success

Each proposed investigation will be evaluated for its technical merit and probability of success. Technical merit will be evaluated by assessing the degree to which the investigation will address the proposed scientific goals and objectives and the degree to which the proposed instrumentation can provide the data needed to complete the proposed investigation. The evaluation will include an assessment of whether the proposed instrumentation can acquire the necessary data, whether the proposed integrated and coordinated observing sequence will be sufficient to complete the proposed investigation (in addition to other scientific objectives), the adequacy of the proposed data analysis and archiving plan, and the timeliness of the release of data to the public domain.

The probability of success will be evaluated by assessing the degree of technical risk associated with the proposed instrumentation, by assessing the degree to which the proposed data-acquisition strategy is likely to succeed, and by assessing the scientific and technical competence of the proposed team. Evaluation of the technical risk will include an assessment of the readiness for flight of the proposed instrumentation, the adequacy of plans for developing critical technology, and the adequacy of technical margins. Evaluation of the scientific and technical competence of the proposed team will include an assessment of the relevant experience of the team.

4.2.3 Mission Impact

Each proposed investigation will be evaluated for mission technical feasibility, operational feasibility, and the impact the investigation will have on critical mission resources.

The mission technical feasibility will be evaluated by assessing the degree to which the investigation can be accomplished within the constraints on mission resources given in Section

3.1 of the appropriate Mission and Project Description document, available through the on-line, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The mission technical feasibility may be judged relatively infeasible if any limits on resources are exceeded.

The evaluation of operational feasibility will include an assessment of the degree to which the mission will be able to support the proposed integrated and coordinated observing sequence. The adequacy of the proposed margins will be evaluated in assessing both the technical feasibility and the operational feasibility.

Although an investigation would be considered technically feasible if the proposed instrumentation were to fit within all the constraints, NASA places value on generating additional reserves in key resources given in Section 3.1 of the appropriate Mission and Project Description document. Proposals can get the highest rating for this criterion only if they are found to use significantly less than the limits on one or more resources.

4.2.4 Cost Risk and Feasibility of Implementation Plan

The technical and management approaches will be evaluated to assess the likelihood that the investigation can be implemented as proposed. The evaluation will include an assessment of the risk of completing the investigation within the proposed cost.

The evaluation will include assessments of

- The proposer's understanding and planned use of the processes, products, and activities required to accomplish the development, integration, test, and operation of the proposed flight instrumentation and supporting systems;

- The capabilities within the team for systems engineering and concurrent engineering (see the “Definition of Some Terms” document in the online Deep Space Systems Program Library, available at http://outerplanets.LaRC.NASA.gov/outerplanets);

- The risk of increased cost to the spacecraft and its supporting systems;

- The relationship between the work and the project schedule, as well as the adequacy of margin in the proposed schedule;

- The methods and rationale used to develop the estimated cost, as well as the adequacy of reserves in the proposed cost;

- The effectiveness of the proposed implementing organization, including the proposed roles and experience of the partners and the commitments of partners and contributors;

- The competence of the management team; and

- The degree of support (logistics, facilities, etc.) offered by the proposing institutions in order to ensure that the investigation can be completed satisfactorily;

Innovative cost-saving features, processes, or approaches will be rewarded if proven sound. Investigations proposing new technology must describe qualification test plans and/or technology backup plans to ensure success. Adequate budget and schedule reserves must be identified to allow the qualification test and backup plans to be implemented, within the total proposed cost and within the program schedule limits.

For the Pluto-Kuiper Express and for Solar Probe, the evaluation will include an assessment of the plans for maintaining expertise and readiness over the long time between mission development and the last encounter.

For the Pluto-Kuiper Express, the evaluation will include an assessment of the potential for delivering the flight instrumentation by August 1, 2002, to support an option of launching in 2003.

4.2.5 New Technology

Plans for both the infusion of new technology and for the transfer of new technology will be evaluated to see if they will have a significant impact in meeting NASA's objectives for advancing the state of the art and making the technical advances available to the people of the United States. The OSS Integrated Technology Strategy is available through Internet URL http://nic.nasa.gov/oss/.

4.3 Criteria for Evaluation of Science Team Member Proposals (Europa Orbiter only)

For proposals to be a member of the Europa Orbiter Radar Team, the evaluation criteria (which are defined more fully in the subsections noted in brackets below) and their percentage weights (given in parentheses) are:

- Scientific Merit [4.3.1] (30);
- Technical Merit and Feasibility [4.3.2] (25);
- Expertise [4.3.3] (25); and
- Feasibility of Implementation Plan [4.3.4] (20).

For proposals to be a member of the Europa Orbiter Gravity Science Team, the evaluation criteria (which are defined more fully in subsections noted in brackets below) and their percentage weights (given in parentheses) are:

- Scientific Merit [4.3.1] (40);
- Technical Merit and Feasibility [4.3.2] (30); and
- Feasibility of Implementation Plan [4.3.4] (30).

Europa Orbiter Science Team Member proposals offering to serve in the Team Leader position as part of the investigation will be evaluated using the factor:

- Suitability for Team Leader Position [4.3.5]

as an additional consideration within the "Feasibility of Implementation Plan" criterion.

4.3.1 Scientific Merit

The goals and objectives of the proposed investigation will be assessed to determine the intrinsic scientific merit of the proposed investigation and its relevance to the specific opportunity described in this AO. The goals and objectives for radar investigations must be explicitly related to data taken by the radar described in the Europa Orbiter Mission and Project Description document, available through the Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The goals and objectives for gravity field investigations must be explicitly related to data taken by Doppler tracking the spacecraft with capabilities described in the Europa Orbiter Mission and Project Description document.

4.3.2 Technical Merit and Feasibility

Each proposed investigation will be evaluated for its technical merit, feasibility, and probability of success based on the reference description of radar and radio-science instrumentation, the spacecraft concept, and the baseline mission described in the Europa Orbiter Mission and Project Description document. Technical merit and feasibility will be evaluated by assessing the degree to which the investigation will address the proposed scientific goals and objectives and the feasibility of obtaining and analyzing the necessary data. The evaluation will include an assessment of whether the mission's facility instrumentation can acquire the necessary data, an assessment of the degree to which mission operations can support the acquisition of the required data, whether the data gathered will be sufficient to complete the proposed investigation, the adequacy of the proposed data analysis and archiving plan, and the timeliness of the release of data to the public domain.

The probability of success will be evaluated by assessing the degree of technical risk associated with the proposed mission operations and by assessing the scientific competence of the PI. Evaluation of the technical risk will include an assessment of the demands on mission operations. Evaluation of the scientific competence of the PI will include an assessment of relevant experience of the PI.

4.3.3 Expertise (Europa Orbiter Radar Team only)

If NASA decides to include an ice-penetrating radar as part of the Europa Orbiter mission, NASA will be seeking a science team with a balance of expert capabilities that will help ensure that all aspects of the radar development and scientific operation will be successful. The expertise sought includes planetary science, earth science with experience in radar sounding of ice sheets, radar science, on-board radar processing, and expertise in antennas.

4.3.4 Feasibility of Implementation Plan

The technical and management approaches will be evaluated to assess the likelihood that the investigation can be implemented as proposed. The evaluation will consider the proposer's understanding of the processes, products, and activities required to accomplish the proposed investigation. The evaluation will also include an assessment of the degree of support (logistics, facilities, etc.) offered by the proposing institutions in order to ensure that the investigation can be completed satisfactorily.

4.3.5 Suitability for Team Leader Position

Proposals offering to lead one of the Europa Orbiter Science Teams will be evaluated to assess the likelihood of success of the Team under the proposed leadership. The strategy for organizing the Team and the effectiveness of proposed Team processes will be assessed to see if they are likely to bring out the best scientific performance from the Team and if they will meet the needs of the common Deep Space Systems Program as described in Section 3 of the Europa Orbiter Mission and Project Description document, available through the on-line, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The experience of the Principal Investigator in leading similar efforts will be evaluated in order to assess the Principal Investigator's skills and stature among scientific peers as a gauge of his or her ability to organize and manage the effort and to lead the negotiations for the team.

Because the Team Leader of the Europa Orbiter Radar Team will be required to assist the common Deep Space Systems Program in guiding the development of the facility instrument, NASA is seeking investigators with substantial experience with radar instrumentation for this position.

4.4 Selection Factors

As described in Section 4.1, NASA will select investigations for this opportunity by considering the results of the proposal evaluations--based on the criteria above--along with the proposed cost to NASA and, for instrument proposals, the results of an evaluation of the proposed E/PO effort.

For proposals offering to provide flight instrumentation, cost may be a significant discriminator in the selection, and proposers are encouraged to make their best offer. It should also be noted that NASA reserves the right to select only a portion of a proposer's investigation and/or to invite his/her participation with other investigators in a joint investigation. In such a case, all affected proposers will be given the opportunity to accept or decline such partial acceptance and/or participation with other investigators (Appendix A, Section 2.)

5. Implementation

NASA will notify the PI's of the selected investigations immediately by telephone, followed by formal written notification. This formal notification will include any issues noted during the evaluation that may require resolution. NASA will notify all other proposers in writing that their investigations were not selected and will offer a debriefing. Such debriefings may be conducted by telephone or, if the Principal Investigator prefers, may be conducted in person at NASA Headquarters. NASA funds may not be used to defray travel costs by the proposer for a debriefing.

It is anticipated that JPL will negotiate and award contracts to implement the selected investigations. For proposals offering to provide flight instrumentation, NASA will conduct Confirmation Reviews for these investigations upon completion of Phase A. Investigations that successfully pass these Confirmation Reviews will be allowed to proceed to definition and development.

6. Conclusion

The Deep Space Systems Program, beginning with the three missions described in this AO, will be an important, new program for extending our research into the outer solar system and close to the Sun itself. NASA's Office of Space Science invites and encourages your participation in this important activity.

Edward J. Weiler
Associate Administrator
for Space Science

Carl B. Pilcher
Science Program Director
for Solar System Exploration

George Withbroe
Science Program Director
for the Sun-Earth Connection

LIST OF APPENDICES

Appendix A

General Instructions and Provisions

APPENDIX A

GENERAL INSTRUCTIONS AND PROVISIONS

TABLE OF CONTENTS

APPENDIX A

GENERAL INSTRUCTIONS AND PROVISIONS

1. 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.

2. 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 investigation 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 cancel this Announcement of Opportunity at any time.

3. Selection Without Discussion

The Government intends to evaluate proposals and award contracts without discussions with offerors. Therefore, each initial offer should contain the offeror's best terms from a cost or price and technical standpoint. However, the Government reserves the right to conduct discussions, if later determined by the Contracting Officer to be necessary.

4. Nondomestic 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 Section 2.8 of the AO shall also apply.

5. 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.

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.

6. Status of Cost Proposals

The investigator's institution agrees that the cost proposal submitted in response to the Announcement 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 or execute all certifications and representations required by law and regulation. Because awards are expected to be in the form of JPL subcontracts, submission of a Standard Form (SF) 1411 Contract Pricing Proposal Cover Sheet is not required.

7. Late Proposals

The Government reserves the right to consider proposals or modifications thereof received after the date indicated for such purpose, if the selecting official deems it to offer NASA a significant technical advantage or cost reduction. (See NFS 18-15.412.)

8. 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 Announcement of Opportunity, those generated by NASA in-house research and development, and those derived from contracts and other agreements between NASA and external entities.

9. 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.

10. Equal Opportunity

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

11. Patent Rights

A. 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.

B. 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.

12. Rights in Data

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

Appendix B

Guidelines for Proposal Preparation

for the

Europa Orbiter Mission

APPENDIX B

GUIDELINES FOR PROPOSAL PREPARATION FOR THE EUROPA ORBITER MISSION

TABLE OF CONTENTS

TABLE OF TABLES

APPENDIX B

GUIDELINES FOR PROPOSAL PREPARATION FOR THE EUROPA ORBITER MISSION

The following guidelines apply to the preparation of proposals in response to the Europa Orbiter Mission part of the AO for the Deep Space Systems Program. The material is a guide for the proposer and not intended to be encompassing or directly applicable to the various types of proposals that can be submitted. The proposer is to provide information relative to those items applicable or as 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 body of the AO shall take precedence.

Proposers may find the definition of several business and management terms used in this AO, such as "New Obligation Authority" and "Work Breakdown Structure" in the Definition of Some Terms document available from the Deep Space Systems Program Library, which can be reached through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

1. General Guidelines

All documents must be typewritten in English, use metric units, and be clearly legible. Except as noted below, submission of proposal material by facsimile, electronic media, videotape, floppy disk, etc., is not acceptable. In evaluating proposals, NASA will only consider printed material. Proposals may not reference a World Wide Web site for any data or material needed to understand or evaluate the proposal.

In addition to providing the data in the printed proposals, proposers must submit a copy of the text of their proposal on either conventional, 1.4 MB, 3.5-inch diskettes or a 100 MB Zip disk that is to accompany their original, signed proposal. The text of the proposal must be either in text-only format or in Portable Document Format (PDF) while the budget data, including the headings for the rows and columns, must be either in tab-delimited text format or in Microsoft Excel workbook file format in files separate from the text of the proposal. The diskettes and Zip disks may be either PC-compatible or Macintosh-compatible and must be labeled with the title of the proposal and the PI's name.

The proposal must consist of only one volume, with readily identified sections. For proposals to develop and use flight instrumentation, the sections of the proposal are to correspond to items 3.1 through 3.14 below. For proposals to be members of Science Teams, the sections of the proposal are to correspond to items 4.1 through 4.10 below. Note the page count requirements for the various sections specified in Tables 1 through 3.

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.). 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) must 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. A 3-ring binder is acceptable for the original signed copy. The other copies for review must be stapled but not otherwise bound.

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. See Tables 1, 2, or 3, depending on the type of proposal being submitted. 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 on 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 1. Page limits for proposals to develop and use a complete package of scientific instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	25
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

Table 2. Page limits for proposals to be a member of the Radar Science Team or a member of the Gravity Field Science Team

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	4.1	Use printed web form
Table of Contents	4.2	No limit
Description of Scientific Investigation	4.3	15
Expertise offered (Europa radar science team only)	4.4	3
Plans for Team Leadership (if offered)	4.5	5
Management Plan and Budget	4.6	No limit
Appendices: (No others permitted) Resume(s) (2 pages maximum each) Letter(s) of Endorsement Contractual Statement(s) of Work References	4.7 through 4.10	No page limit, but small size encouraged

Table 3. Page limits for proposals to develop and use other flight instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	20
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

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

3. Contents of Proposals to Develop and Use Flight Instrumentation

The content of each proposal is described below. Flight instrumentation is considered a "complete package" if the proposed instrumentation can be used to meet essentially as much of the Europa Orbiter Group 1 objectives as 1) a set of instruments that meets the altimetry and imaging measurement objectives given in Sections 2.1.3.2 and 2.1.3.4 of the Europa Orbiter Mission and Project Description document, or 2) a set of instruments that meets the radar sounding objectives given in Section 2.1.3.3 of the document, or 3) a set of instruments that meets the altimetry, radar sounding, and imaging measurement objectives given in Sections 2.1.3.2, 2.1.3.3, and 2.1.3.4 of the document. (The Europa Orbiter Mission and Project Description document is available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.) Other techniques may be proposed for which these measurement objectives may not be directly applicable, but in order to be considered a "complete package," a proposed set of instrumentation must permit investigations that can achieve about as much (or more) of the Group 1 science objectives as could be achieved with the reference measurement objectives. Proposals offering a complete package of instrumentation are allowed somewhat more pages for describing their investigations than proposals offering flight instrumentation that is not a complete package. (See Tables 1 and 3.)

Proposers must keep in mind that NASA has decided that if an ice penetrating radar system is developed, it will be developed by the Project through a consortium and operated as a facility instrument for scientific investigations. Independent radar instrument designs are not solicited by this AO; nor may a radar be included in an integrated payload proposal.

Proposals offering "complete packages" under the definitions 1) or 2) above must apply the resource guidelines of "Nonradar" and "Radar," respectively, in Table 6 of the Europa Orbiter Mission and Payload Description document. The only exception is for the external volume in the "Radar" column. No specific volume requirements have been developed, but proposers should imagine a volume more like the one available for the "Nonradar" external volume, mounted where the Yagi antenna is mounted in Figure 16 of the Europa Orbiter Mission and Payload Description document. Other mounting locations can be suggested by the proposer.

Proposals offering "complete packages" under the definition 3) above must apply the resource guidelines of "Total" in Table 6 of the Europa Orbiter Mission and Payload Description document. Again, there is an exception in the case of external volume where additional volume in another location would be available. The guidelines of the paragraph above apply.

Proposers offering "complete packages" under the definition 3) above may also wish to have part of their proposals considered for selection as "complete packages" under the definition 1). There are two means for doing this. First, a proposer may offer his/her team's capabilities to investigate the "radar objectives" of definition 2) as an option over and above a baseline to investigate the "nonradar objectives" of definition 1). As long as the resource requirements for the baseline proposal also fit definition 1), the proposal will be evaluated as if it were two separate proposals. Enhancements to the scientific investigation, the plan for technology infusion and technology transfer, and the plan for education/public outreach must be clearly described and differentiated relative to the baseline investigation, as must impacts to the implementation plan. The overall proposal, consisting of the baseline proposal and all options, must fit within the page count limits for a single, "complete package" proposal. Second, the proposer may submit two proposals, one a "complete package" under definition 1) and the other a "complete package" under definition 3). This alternative will permit more flexibility with respect to the use of resources for the "complete package" under definition 3).

3.1 Cover Page/Investigation Summary

All proposals must be prefaced by an integrated Cover Page/Proposal Summary that contains important, required information (see below). Produce this item by first entering the requested information electronically through the World Wide Web site given in Section 5.2 of this appendix. Section 5.2 of this appendix also provides a point of contact for any proposer who does not have access to the Web or who experiences difficulty in using the specified site. Use a printed copy of the electronically submitted form to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, use reproductions of this original *Cover Page/Proposal Summary* to preface the required printed copies of the proposal.

The names, addresses, telephone and fax numbers, and electronic mail addresses of the Principal Investigator, all Co-Investigators, and the authorizing official shall be included. In addition, the electronic *Cover Page/Proposal Summary* form will provide a block of space (about one page in length) for a self-contained Proposal Summary of the proposed research activity. The Proposal Summary is intended to provide background and perspective to the interested reader and, therefore, must include the following key information:

- A description of the key, central objectives of the proposed research in terms sufficient for a nonspecialist not familiar with the document to grasp its essence;

- A statement of methods proposed to accomplish those proposed objectives; and

- The perceived significance of the proposed investigation to NASA OSS interests.

Note: NASA intends to publish the proposal title, the PI name and institution, and the Proposal Summary of every selected investigation in a public data base. Therefore, the Proposal Summary must not include proprietary information that would preclude its unrestricted release (see also Appendix A, Section 5).

Changes (such as whiteout or strikethrough) to the printed Cover Page/Proposal Summary are not permitted. The proposer may make needed changes to the information submitted electronically only by editing the electronic submission following the instructions at the World Wide Web site given in Section 5.2 of this appendix. After submitting the final Cover Page/Proposal Summary electronically, the proposer must then print the correct and final version and obtain the necessary signatures.

Note: The authorizing institutional signature now also certifies that the proposing institution has read and is in compliance with the three required certifications printed in full at the end of this appendix. NASA does not, therefore, require institutions to submit these certifications with the proposal.

3.2 Table of Contents

The proposal must contain a table of contents that parallels the outline provided below in Sections 3.3 through 3.14.

3.3 Description of Scientific Investigation

The description must cover the scientific objectives of the proposed investigation, the quantity and quality of data needed in order to perform the investigation, how the Europa Orbiter mission and the proposed instrumentation will acquire the needed data, operational constraints that must be met while acquiring 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 understanding of Europa. It must describe the history and basis for the proposal and must discuss the need for such an investigation. This section must also include a quantitative analysis of how the proposed investigation addresses each of the Group 1 objectives and any applicable Group 2 objectives for the Europa Orbiter.

2. Science Implementation. This section must describe how the investigation will accomplish its goals and objectives. The description must include an overview of how the mission and instruments will acquire the data for the investigation. The quality of the data to be returned (resolution, coverage, etc.) and the quantity of data to be returned must be described. The relationship linking the data products, measurement objectives, and the investigation's scientific goals and objectives must be described quantitatively.

This section must also describe the instrumentation. The required performance and the expected margins in performance must be covered. In describing the instrumentation, the proposal must present the scheme for ensuring that the optics, sensors, electronics, and other parts of the flight instrumentation will withstand the anticipated radiation environment through the nominal mission. There must also be a description of the resources required by the instrumentation, the margins planned for these resources, and a comparison of the requirements to the limits on the resources given in Section 3.1 of the Europa Orbiter Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. Any use of radioactive sources within the proposed instrumentation must be identified and characterized.

For proposals that do not offer "complete packages," resource requirements must be the minimum that would permit a scientifically productive investigation, keeping in mind the relative levels of criticality for the resources given in Section 3.1 of the Europa Orbiter Mission and Project Description document. Proposers may wish to describe higher performance options for their investigation but should be aware that higher demands on resources will make it less likely that these options could be accommodated.

This section must also describe how the mission and instrumentation will work together, covering all phases of the program from selection through encounter.

The strategy for acquiring and managing data must be described and an integrated and coordinated observing sequence must be given which puts the strategy into a practical form and includes the needs of the spacecraft and of the other science teams. The integrated and coordinated observing sequence must cover sequences of events on a daily basis for the nominal mission period following Europa orbit insertion. The observing sequence must integrate all the observations of the proposed instrumentation in order to meet the scientific objectives proposed for the specific investigation. The observing sequence must coordinate the observations with the gravity and (if appropriate) radar observing requirements and mission operations requirements given in Section 2 of the Europa Orbiter Mission and Project Description document. Proposals must provide enough detail to demonstrate the capability of the mission to accomplish their data collection and management activities in the context of the activities of the entire mission.

This section should include a brief analysis of the effects of adopting a +45° (or 135°) orbit inclination, rather than the reference 83° inclination, as a way of mitigating planetary protection requirements.

This section must also describe how the data will be analyzed and archived. In addition to descriptions of the various data products, the plans for equipment and staffing must be given, along with the rationale for the plans. The plans for releasing data to the public domain must be described.

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.

Finally, this section must also describe the investigation's science team, their responsibilities, their relevant experience, and, if appropriate, how their experience is relevant to their responsibilities.

3.4 Plan for Technology Infusion and Technology Transfer

This section must describe both the extent to which the proposed investigation will advance the state of the art through the infusion of new technology and the plans for transferring advanced technology associated with the investigation to other potential users in the United States. In describing the infusion of technology, the proposal must provide references to the state of the art and metrics that quantify the degree of advancement that the investigator expects to achieve. In describing plans for transferring technology, the proposal must identify potential users and provide data on why the potential users would find the new technology useful.

3.5 Education/Public Outreach

Guidelines for this section of the proposal are given in Appendix F, Education/Public Outreach Proposals as Part of Proposals to the Deep Space Systems Program.

3.6 Implementation Plan, Management, Schedule, Basis of Cost, and Cost-Estimating Methodology

Proposers are reminded that cost may be a significant discriminator in the selection. See Sections 4.1 and 4.4 in the main body of the AO.

1. Plans for designing, developing, integrating, testing, and operating flight instrumentation and its supporting systems

   The plans must consider the interactions with the Outer Planets/Solar Probe Project as described in Section 3 of the Europa Orbiter Mission and Project Description document. The plans must also make specific reference to the deliveries identified in the Statement of Work submitted as part of the proposal.

This section must begin with an overview that puts the general plans in the context of the approach for managing the performance and reliability of flight instrumentation, its supporting systems, and the software. The approach for ensuring performance must be given, covering at the least:

- Potential risks to the proposed investigation and plans for mitigating those risks;
- Technology development plans and back-up plans if the technologies do not meet development needs; and
- Strategy for minimizing process variability and product variability.

The approach for assuring reliability must be given, reflecting the requirements given by the Instrument Mission Assurance and Safety Requirements document available through the Deep Space Systems Program Library at Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

The approach for meeting Europa planetary protection requirements must be given, reflecting the requirements given by the Europa Orbiter Preliminary Planetary Protection Requirements document available through the Deep Space Systems Program Library at Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

The heritage of various parts of the instrumentation, supporting systems, and software must be described. For heritage at the component level, the amount of departure from "build-to-print of qualified component" must be quantified. The past use of the component must be described along with a summary of how the proposed use of the component will differ from the past use. Also, the environment of past use must be described along with a summary of how the environment of this proposed use will differ from the environment of past use. Finally, the status of the source of heritage must also be given. If the source of heritage has not completed a qualification program, the heritage must be identified as "potential heritage" even though the level of heritage may be high. For flight hardware components with high heritage or high potential heritage, compare the mass, power, and volume of the proposed component with the mass, power, and volume of the source of heritage. For claims of heritage at higher levels of integration, similar information must be included in the description.

For any level of heritage claimed, cost information about the referenced sources of heritage will be required in the section on cost-estimating methodology.

This discussion must include the top 3-5 risks and descoping strategies, if relevant. Descope plans must also include a description of their impacts on the attainment of the science objectives and on resource requirements.

The section must include a description of the plans for design and systems engineering of the flight instrumentation, supporting systems, and software. The approach to working with the spacecraft and mission design team must be given, and the proposers must describe their capabilities for concurrent engineering.

Fabrication processes must be described, including the team's "in-house" fabrication capability and the availability of capable vendors. The approach to assembly, integration and test for the flight instrumentation, supporting systems, and software must be given--both for the development of the instrumentation and for integration with the spacecraft.

2. Management and Schedule

This section must summarize the investigator's proposed management approach, putting it in the context of the work to be accomplished. A Work Breakdown Structure (WBS) must be presented that covers the entire effort of the investigation.

The management organization (including an organization chart) and decision-making process must be described, and the teaming arrangement (as known) must be discussed. The responsibilities of team members, including contributors, and institutional commitments must be discussed. Unique capabilities that each team member organization brings to the team, as well as previous experience with similar systems and equipment, must be addressed. The specific roles and responsibilities of the Principal Investigator and Project Manager must be described. Management strategies must be described for the control, allocation, and release of technical, cost, and schedule reserves and margins. When contracts are required, the acquisition strategy, including the incentive strategy, must be described.

A proposal may designate a Co-I at an institution other than that of the PI as an *Institutional PI* if the Co-I is making a major contribution to the proposal (e.g., a substantial portion of an investigation's instrumentation) and who serves as the point of contact at the Co-I's institution. (Note: In some cases, NASA or JPL may elect to provide an award directly to that Co-I institution with the Institutional PI serving as the "PI" for what otherwise would be a subcontract from the proposing PI institution. However, in this case, the proposal's designated PI is still held responsible by NASA for the overall scientific direction of the proposed effort.)

An investigation schedule covering all phases of the investigation must be provided, along with a more detailed, development schedule covering contract start (nominally as a JPL subcontract) through launch plus 30 days. The development schedule must include, as a minimum, major project review dates; instrument development;

instrument-to-spacecraft integration and test; launch vehicle integration; launch operations; and postlaunch checkout of the instrumentation. Schedule reserve in the development schedule must be clearly identified, and the relationship between the work and the schedule must be explained.

3. Basis of Cost and Cost-Estimating Methodology

   This section must provide a narrative explanation of the cost and the budget presented in the proposals cost and budget tables.

   The methodology used to estimate the cost--for example, specific cost model, past performance, or cost estimating relationships from analogous missions--must be discussed. Budget reserve strategy, including budget reserve levels as a function of mission phase, must be discussed. Please provide assumptions used in developing cost estimates to help facilitate the reviewers' understanding of proposed cost estimates. Also, the proposal must provide cost information (in FY 2000, fixed year dollars) about any items that provide heritage to the investigation.

4. Relaxation of Cost and Schedule Drivers

   Proposers are encouraged to identify any implementation requirements in this AO that are significant cost and/or schedule drivers and that could be relaxed with minimal increase in the risk of unsuccessful implementation and operation. The estimated cost and/or schedule savings possible by relaxing each such requirement must be given.

5. International Participation

   Proposals which include international participation, either through involvement of foreign nationals and/or involvement of foreign entities must include 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. 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 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 through Internet URL's 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, 22 CFR 120-130, *et seq*.

3.7 Cost and Budget Tables

This section shall include an estimated cost of the investigation that encompasses all proposed activities, divided into two budgets--one for the development phase (up through launch plus 30 days) and one for the operations phase. The budget line items must correspond to the elements at the second level of the proposed Work Breakdown Structure with one budget line summarizing the E/PO effort. Details of the E/PO budget are to be included in the E/PO proposal following the guidelines in Appendix F.

The amount required in each fiscal year must be identified by providing the data in Table 4 (development) and Table 5 (operations). Each budget must be presented twice, once in real year dollars and once in fixed, Fiscal Year 2000 dollars. Table 6 gives the inflation model that must be used in converting from real year dollars to Fiscal Year 2000 dollars. These amounts must represent the need for new budget authority allotted to the contract (nominally a JPL subcontract) in each fiscal year.

3.8 Resumes

Resumes or curriculum vitae must be provided for each member of the investigation's science team identified in the science section and for other key personnel. Each resume must clearly show experience related to the job the individual will perform on the proposed investigation. Resumes or curriculum vitae must not exceed two pages in length for each participant.

Table 4. Development phase budget profile template (submit this table twice, once in real year dollars and once in fixed, FY 2000 dollars)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**		FY00	FY01	FY02	FY03	FY04	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 5. Operations phase budget profile template (also submitted twice)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**	FY04	FY05	FY06	FY07	FY08	FY09	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 6. NASA New Start inflation index

Fiscal Year	2000	2001	2002	2003	2004	2005
Inflation Over Previous Year	3.2%	3.1%	3.1%	3.1%	3.1%	3.1%
Cumulative Inflation Index Over FY 2000	1.000	1.031	1.063	1.096	1.130	1.165

Use an inflation rate of 3.1% for years beyond 2005.

3.9 Statements of Commitment from Co-Investigators

Every Co-I and Collaborator from a U.S., as well as a non-U.S., institution identified as a participant in the proposal must submit a brief, signed statement of commitment that acknowledges his/her participation, even if he/she is from the PI's own institution. In the case of more than one Co-I and/or Collaborator, a single, multiply-signed statement is acceptable. Each statement must be addressed to the PI, may be a facsimile or E-mail, and must contain the following, or approximately similar, language:

> "I(we) acknowledge that I(we) am(are) identified by name as Co-Investigator(s) [or Collaborator(s)] to the investigation entitled <*name of proposal*> that is submitted by <*name of Principal Investigator*> to the Europa Orbiter opportunity of the Outer Planets AO, and that I(we) intend to carry out all responsibilities identified for me(us) in this proposal. I(we) understand that the extent and justification of my(our) participation as stated in this proposal will be evaluated during peer review in determining the merits of this proposal."

In case of E-mail statements, names typed after the statement will be construed as signatures.

3.10 Letters of Endorsement

Letters of endorsement must be provided from <u>all</u> organizations offering goods and/or services on a no-exchange-of-funds basis, including non-U.S. organizations providing hardware or software to the investigation. Letters of endorsement must be signed by institutional and/or Government officials authorized to commit their organizations to participation in the proposed investigation. Copies of faxed or E-mailed letters from non-U.S. participants may be substituted in the submitted proposals as long as signed letters are received by the date and time specified in Section 1.3 of the AO. Non-U.S. organizations must submit the original letters to:

Ms. Wavalene Barnes-Hill
Ref: Europa Orbiter Mission
Space Science and Aeronautics Division
Code IS
National Aeronautics and Space Administration
Washington, DC 20546-0001
Phone: (202) 358-0900

with a copy to the address given in Section 5.3 of this appendix.

3.11 Contractual Statements of Work

For investigations managed from non-Government institutions, provide a Statement of Work to be used in a JPL subcontract with the investigator. For investigations managed from Government institutions, provide a Statement of Work as if the institution were non-Government. The Statement of Work must include general task statements for the development phase and for the operations phase of the investigation. All Statements of Work must include the following as a minimum: Scope of Work, Deliverables (including science data), and Government Responsibilities (as applicable). Statements of Work need not be more than a few pages in length. If more than one contractual arrangement between NASA and the proposing team is required, funding information must be provided which identifies how funds are to be allocated among the organizations.

The Statement of Work must make specific reference to the delivery of documentation and other deliverables as described in Section 3 of the Europa Orbiter Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

3.12 NASA PI Hardware Selection Process

Proposals that have NASA employees as Principal Investigators must contain the following information concerning the process by which non-Government participants were included in the proposal. The proposal must (i) indicate that the supplies or services of the proposed non-Government participant(s) are available under an existing NASA contract; (ii) make it clear that the capabilities, products, or services of these participant(s) are sufficiently unique to justify a sole source acquisition; or (iii) describe the open process that was used for selecting proposed team members. While a formal solicitation is not required, the process cited in (iii) must include at least the following competitive aspects: notice of the opportunity to participate to potential sources; submissions from and/or discussions with potential sources; and objective criteria for selecting team members among interested sources. The proposal must address how the selection of the proposed team members followed the objective criteria and is reasonable from both a technical and cost standpoint. The proposal must also include a representation that the Principal Investigator has examined his/her financial interests in or concerning the proposed team members and has determined that no personal conflict of interest exists. The proposal must provide a certification by a NASA official superior to the Principal Investigator verifying the process for selecting contractors as proposed team members, including the absence of conflicts of interest.

Proposals that do not have NASA employees as Principal Investigators do not have to contain this information.

3.13 References

This section may provide a list of reference documents used in the proposal. The documents themselves cannot be submitted, except as a part of the proposal and included within the prescribed page count.

3.14 Acronym List

Inclusion of an acronym list is optional.

4. Contents of Proposals to Be a Member of a Science Team

The content of each proposal is described below.

4.1 Cover Page/Investigation Summary

All proposals must be prefaced by an integrated Cover Page/Proposal Summary that contains important, required information (see below). Produce this item by first entering the requested information electronically through the World Wide Web site given in Section 5.2 of this appendix. Section 5.2 of this appendix also provides a point of contact for any proposer who does not have access to the Web or who experiences difficulty in using the specified site. Use a printed copy of the electronically submitted form to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, use reproductions of this original *Cover Page/Proposal Summary* to preface the required printed copies of the proposal.

The names, addresses, telephone and fax numbers, and electronic mail addresses of the Principal Investigator and the authorizing official shall be included. In addition, the electronic *Cover Page/Proposal Summary* form will provide a block of space (about one page in length) for a self-contained Proposal Summary of the proposed research activity. The Proposal Summary is intended to provide background and perspective to the interested reader and, therefore, must include the following key information:

- A description of the key, central objectives of the proposed research in terms sufficient for a nonspecialist not familiar with the document to grasp its essence;
- A statement of methods proposed to accomplish those proposed objectives; and
- The perceived significance of the proposed investigation to NASA OSS interests.

Note: NASA intends to publish the proposal title, the PI name and institution, and the Proposal Summary of every selected investigation in a public data base. Therefore, the Proposal Summary must not include proprietary information that would preclude its unrestricted release (see also Appendix A, Section 5).

Changes (such as whiteout or strikethrough) to the printed Cover Page/Proposal Summary are not permitted. The proposer may make needed changes to the information submitted electronically only by editing the electronic submission following the instructions at the World Wide Web site given in Section 5.2 of this appendix. After submitting the final Cover Page/Proposal Summary electronically, the proposer must then print the correct and final version and obtain the necessary signatures.

Note: The authorizing institutional signature now also certifies that the proposing institution has read and is in compliance with the three required certifications printed in full at the end of this appendix. NASA does not, therefore, require institutions to submit these certifications with the proposal.

4.2 Table of Contents

The proposal must contain a table of contents that parallels the outline provided below in Sections 4.3 through 4.10 of this section of the appendix.

4.3 Description of Scientific Investigation

The description must include the scientific objectives of the proposed investigation, what data are needed in order to perform the investigation, operational constraints that must be met while acquiring 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 understanding of Europa. It must describe the history and basis for the proposal and must discuss the need for such an investigation. This section must also include a summary of how the proposed investigation addresses each of the Group 1 objectives and any applicable Group 2 objectives for the Europa Orbiter.

2. Data Requirements. The 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 must be discussed. 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, images, 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. The plan for producing and delivering data to the Planetary Data System must be described.

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.

This section should include a brief analysis of the effects of adopting a +45° (or 135°) orbit inclination, rather than the reference 83° inclination, as a way of mitigating planetary protection requirements.

3. Mission Requirements. This section must describe expected requirements and constraints on the operation of the mission as the data are acquired.

4.4 Expertise Offered (Europa Orbiter radar science team only)

The proposer must identify which of the following areas of expertise he/she is offering to provide: planetary science, earth science with experience in radar sounding of ice sheets, radar science, onboard radar processing, or expertise in antennas. The proposal must state what technical contributions the PI expects to make to the development of the radar system. The PI must also demonstrate relevant experience, skills, and knowledge.

4.5 Plans for Team Leadership (if offered)

If the proposer is offering to serve as the Team Leader for the Science Team, the proposal must include a section on plans for leading the team. This section must also include experience the investigator has that is relevant to the task of team leadership.

The plans for leading the team must include a discussion of the investigator's vision of what will make the team successful and what he or she plans to do in order to ensure the team's success. The leading problems that will face the team must be discussed. A strategy on how to organize, a system for team operations, and the required mix of team member skill and experience must be described. The amount of time each year that the proposer plans to dedicate to leading the team and representing the team must be given.

This section of the proposal must also describe the candidate Team Leader's experience in leading any similar teams. Experience in flight mission planning and operations must also be given. For proposers offering to be Team Leader of the Europa Orbiter Radar Team, experience with radar instrumentation must be described.

4.6 Management Plan and Budget

This section must summarize the investigator's proposed management approach, putting it in the context of the work to be accomplished. The responsibilities of team members, including contributors, and institutional commitments must be discussed. The management plan must include a master schedule for accomplishing the proposed work.

The cost plan must summarize the total investigation cost, divided into two budgets--one for the development phase and one for the operations phase--using the categories of cost given below. Each budget must be presented twice, once in real year dollars and once in fixed, Fiscal Year 2000 dollars. Table 6 gives the inflation model that must be used in converting from real year dollars to Fiscal Year 2000 dollars. The development phase runs from the start of the contract (nominally as a JPL subcontract) to launch plus 30 days. The operations phase runs from the end of the development phase through the date given for the end of analysis in the body of the AO. The expected effort to participate in E/PO activities must be included as a part of each budget.

For investigators offering to serve as Team Leaders, the management plan and budget for the proposed scientific investigation must stand alone, and an additional management plan and budget must be presented for the activities of team leadership.

For each budget, the first page must give a summary for the total effort for the phase, covering all years, and the following pages must give a summary for each fiscal year. These amounts must represent the need for new budget authority allotted to the contract (nominally a JPL subcontract) in each fiscal year.

The categories of cost must include the following:

1. 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.

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

3. Materials--This must give the total cost of the bill of materials, including estimated cost of each major item. Include lead time of critical items,

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

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

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

7. Other Costs--Costs not covered elsewhere.

8. 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.

9. Fee (if applicable).

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.

4.7 Resume(s)

Resumes or curriculum vitae must be provided for the PI and all other key personnel. Each resume must clearly show experience related to the job the individual will perform on the proposed investigation. Resumes or curriculum vitae must not exceed two pages in length for each participant.

4.8 Letters of Endorsement

Letters of endorsement must be provided from all organizations offering goods and/or services on a no-exchange-of-funds basis, including non-U.S. organizations providing hardware or software to the investigation. Letters of endorsement must be signed by institutional and/or Government officials authorized to commit their organizations to participation in the proposed investigation. Copies of faxed or E-mailed letters from non-U.S. participants may be substituted in the submitted proposals as long as signed letters are received by the date and time specified in Section 1.3 of the AO. Non-U.S. organizations must submit the original letters to:

Ms. Wavalene Barnes-Hill
Space Science and Aeronautics Division
Code IS
Ref: Europa Orbiter
National Aeronautics and Space Administration
Washington, DC 20546-0001
Phone: (202) 358-0900

with a copy to the address given in Section 5.3 of this appendix.

4.9 Contractual Statements of Work

For investigations managed from non-Government institutions, provide a Statement of Work to be used in a JPL subcontract with the investigator. For investigations managed from Government institutions, provide a Statement of Work as if the institution were non-Government. The Statement of Work must include general task statements for the

development phase and for the operations phase of the investigation. All Statements of Work must include the following as a minimum: Scope of Work, Deliverables (including science data), and Government Responsibilities (as applicable). Statements of Work need not be more than a few pages in length. If more than one contractual arrangement between NASA and the proposing team is required, funding information must be provided which identifies how funds are to be allocated among the organizations.

The Statement of Work must make specific reference to the delivery of documentation and other deliverables as described in Section 3 of the Europa Orbiter Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

The Statement of Work must state that the PI and members of the PI's supporting team are prepared to spend an average of approximately 5% of their time, as part of their normal ongoing work, supporting Education/Public Outreach activities. The Statement of Work must also state that the effort is covered in their budget.

4.10 References

This section may provide a list of reference documents used in the proposal. The documents themselves cannot be submitted, except as a part of the proposal and included within the prescribed page count.

5. Submittal Information

5.1 Notice of Intent to Propose

NASA strongly encourages that all prospective proposers submit a Notice of Intent in accordance with the schedule in Section 1.3 of the body of the AO. Proposers must prepare this Notice of Intent in English and submit it electronically using the form found at Internet URL http://cass.jsc.nasa.gov/panel/. Anyone experiencing difficulty with this process must call the Lunar and Planetary Institute for assistance at (281) 486-2137.

5.2 Electronic Cover Page

The cover page for each proposal must be prepared electronically following the instructions in Section 3.1 (Flight Instrumentation) or Section 4.1 (Science Team Member) of this appendix. The form can be found at Internet URL http://cass.jsc.nasa.gov/panel/. Again, anyone experiencing difficulty with this process must call the Lunar and Planetary Institute for assistance at (281) 486-2137.

5.3 Submittal Address

Proposals must be delivered to:

Europa Orbiter Program
The Lunar and Planetary Institute
3600 Bay Area Boulevard
Houston, TX 77058
(Delivery phone: 281-486-2189)

by the due date given in Section 1.3 of the body of the AO.

6. Certifications

The following pages contain, for reference only, copies of the three currently required Certifications. Note that the signature of the Authorizing Institutional Representative on the printed copy of the Cover Page submitted with the proposal now verifies that the proposing organization complies with these Certifications; therefore, these Certifications do not have to be independently signed and submitted as in previous Announcements of Opportunity.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, 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:
   (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
   (b) 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;
   (c) 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
   (d) 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.

Certification Regarding Lobbying

(1) 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.

(2) 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.

(3) 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.

Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs

The *(Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "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 1962 (20 U.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 give 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 such property, any transferee, for the period during which the real property or structure is used for a purpose for which the 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 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, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized 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.

NASA Form 1206

Appendix C

Guidelines for Proposal Preparation

for the

Pluto-Kuiper Express Mission

APPENDIX C

GUIDELINES FOR PROPOSAL PREPARATION FOR THE PLUTO-KUIPER EXPRESS MISSION

TABLE OF CONTENTS

TABLE OF TABLES

APPENDIX C

GUIDELINES FOR PROPOSAL PREPARATION FOR THE PLUTO-KUIPER EXPRESS MISSION

The following guidelines apply to the preparation of proposals in response to the Pluto-Kuiper Express Mission part of the AO for the Deep Space Systems Program. The material is a guide for the proposer and not intended to be encompassing or directly applicable to the various types of proposals that can be submitted. The proposer is to provide information relative to those items applicable or as 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 body of the AO shall take precedence.

Proposers may find the definition of several business and management terms used in this AO, such as "New Obligation Authority" and "Work Breakdown Structure" in the Definition of Some Terms document available from the Deep Space Systems Program Library, which can be reached through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

1. General Guidelines

All documents must be typewritten in English, use metric units, and be clearly legible. Except as noted below, submission of proposal material by facsimile, electronic media, videotape, floppy disk, etc., is not acceptable. In evaluating proposals, NASA will only consider printed material. Proposals may not reference a World Wide Web site for any data or material needed to understand or evaluate the proposal.

In addition to providing the data in the printed proposals, proposers must submit a copy of the text of their proposal on either conventional, 1.4 MB, 3.5-inch diskettes or a 100 MB Zip disk that is to accompany their original, signed proposal. The text of the proposal must be either in text-only format or in Portable Document Format (PDF) while the budget data, including the headings for the rows and columns, must be either in tab-delimited text format or in Microsoft Excel workbook file format in files separate from the text of the proposal. The diskettes and Zip disks may be either PC-compatible or Macintosh-compatible and must be labeled with the title of the proposal and the PI's name.

The proposal must consist of only one volume, with readily identified sections corresponding to items 3.1 through 3.14 below. Note the page count requirements for the various sections specified in Tables 1 and 2.

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.). 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) must 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. A 3-ring binder is acceptable for the original signed copy. The other copies for review must be stapled but not otherwise bound.

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. See Tables 1 or 2 depending on the type of proposal being submitted. 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 on 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 1. Page limits for proposals to develop and use the radio science instrumentation or a complete package of remote sensing instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	25
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

Table 2. Page limits for proposals to develop and use other flight instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	20
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

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

3. Contents of Proposals

The content of each proposal is described below. Instrumentation is considered a "complete package" if the proposed instrumentation can be used to meet essentially as much of the Pluto-Kuiper Express Group 1 objectives as a set of instruments that meets the geology and geomorphology, surface composition mapping, and the neutral atmosphere characterization (except lower atmosphere thermal structure) measurement objectives given in Section 2.1.3 of the Pluto-Kuiper Express Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. Other techniques may be proposed for which these measurement objectives may not be directly applicable, but in order to be

considered a "complete package," a proposed set of instrumentation must permit investigations that can achieve about as much (or more) of the Group 1 science objectives as could be achieved with the reference measurement objectives. Proposals offering to develop and use the ultra-stable oscillator or a complete package of instrumentation are allowed somewhat more pages for describing their investigations than other proposals that might be submitted. (See Tables 1 and 2.)

3.1 Cover Page/Investigation Summary

All proposals must be prefaced by an integrated Cover Page/Proposal Summary that contains important, required information (see below). Produce this item by first entering the requested information electronically through the World Wide Web site given in Section 4.2 of this appendix. Section 4.2 of this appendix also provides a point of contact for any proposer who does not have access to the Web or who experiences difficulty in using the specified site. Use a printed copy of the electronically submitted form to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, use reproductions of this original *Cover Page/Proposal Summary* to preface the required printed copies of the proposal.

The names, addresses, telephone and fax numbers, and electronic mail addresses of the Principal Investigator, all Co-Investigators, and the authorizing official shall be included. In addition, the electronic *Cover Page/Proposal Summary* form will provide a block of space (about one page in length) for a self-contained Proposal Summary of the proposed research activity. The Proposal Summary is intended to provide background and perspective to the interested reader and, therefore, must include the following key information:

- A description of the key, central objectives of the proposed research in terms sufficient for a nonspecialist not familiar with the document to grasp its essence;
- A statement of methods proposed to accomplish those proposed objectives; and
- The perceived significance of the proposed investigation to NASA OSS interests.

Note: NASA intends to publish the proposal title, the PI name and institution, and the Proposal Summary of every selected investigation in a public data base. Therefore, the Proposal Summary must not include proprietary information that would preclude its unrestricted release (see also Appendix A, Section 5).

Changes (such as whiteout or strikethrough) to the printed Cover Page/Proposal Summary are not permitted. The proposer may make needed changes to the information submitted electronically only by editing the electronic submission following the instructions at the World Wide Web site given in Section 4.2 of this appendix. After submitting the final Cover Page/Proposal Summary electronically, the proposer must then print the correct and final version and obtain the necessary signatures.

Note: The authorizing institutional signature now also certifies that the proposing institution has read and is in compliance with the three required certifications printed in full at the end of this appendix. NASA does not, therefore, require institutions to submit these certifications with the proposal.

3.2 Table of Contents

The proposal must contain a table of contents that parallels the outline provided below in Sections 3.3 through 3.14.

3.3 Description of Scientific Investigation

The description must cover the scientific objectives of the proposed investigation, the quantity and quality of data needed in order to perform the investigation, how the Pluto-Kuiper Express mission and the proposed instrumentation will acquire the needed data, operational constraints that must be met while acquiring 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 understanding of the Pluto system. It must describe the history and basis for the proposal and must discuss the need for such an investigation. This section must also include a quantitative analysis of how the proposed investigation addresses each of the Group 1 objectives and any applicable Group 2 or Group 3 objectives for the Pluto-Kuiper Express.

2. Science Implementation. This section must describe how the investigation will accomplish its goals and objectives. The description must include an overview of how the mission and instruments will acquire the data for the investigation. The quality of the data to be returned (resolution, coverage, etc.) and the quantity of data to be returned must be described. The relationship linking the data products, measurement objectives, and the investigation's scientific goals and objectives must be described quantitatively.

   This section must also describe the instrumentation. The required performance and the expected margins in performance must be covered. The required performance for visible imaging must include the optical navigation requirements given in Section 2.1.4.1.1 of the Pluto-Kuiper Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. In describing the instrumentation, the proposal must present the scheme for ensuring that optics, sensors, electronics, and other parts of the flight instrumentation will withstand the

anticipated space environment through the nominal mission. There must also be a description of the resources required by the instrumentation, the margins planned for these resources, and a comparison of the requirements to the limits on the resources given in Section 3.1 of the Pluto-Kuiper Mission and Project Description document. Any use of radioactive sources within the proposed instrumentation must be identified and characterized.

For proposals that are not offering "complete packages," resource requirements must be the minimum that would permit a scientifically productive investigation, keeping in mind the relative levels of criticality for the resources given in Section 3.1 of the Pluto-Kuiper Express Mission and Project Description document. Proposers may wish to describe higher performance options for their investigation but should be aware that higher demands on resources will make it less likely that these options could be accommodated.

This section must also describe how the mission and instrumentation will work together, covering all phases of the program from selection through encounter.

The strategy for acquiring and managing data must be described, and an integrated and coordinated observing sequence must be given which puts the strategy into a practical form and includes the needs of the spacecraft and of the other science teams. The integrated and coordinated observing sequence must cover sequences of events with one-day resolution as necessary for events leading up to encounter and must cover sequences of events on a daily basis for the nominal encounter phase. The observing sequence must integrate all the observations of the proposed instrumentation in order to meet the scientific objectives proposed for the specific investigation. The observing sequence must coordinate the observations with other Group 1 investigation requirements and mission operations requirements given in Section 2 of the Pluto-Kuiper Mission and Project Description document. Proposals must provide enough detail to demonstrate the capability of the mission to accomplish their data collection and management activities in the context of the activities of the entire mission.

This section must also describe how the data will be analyzed and archived. In addition to descriptions of the various data products, the plans for equipment and staffing must be given, along with the rationale for the plans. The plans for releasing data to the public domain must be described.

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.

Finally, this section must also describe the science team, their responsibilities, their relevant experience, and, if appropriate, how their experience is relevant to their responsibilities. The strategy for maintaining expertise during the long time from launch to encounter must be described.

3.4 Plan for Technology Infusion and Technology Transfer

This section must describe both the extent to which the proposed investigation will advance the state of the art through the infusion of new technology and the plans for transferring advanced technology associated with the investigation to other potential users in the United States. In describing the infusion of technology, the proposal must provide references to the state of the art and metrics that quantify the degree of advancement that the investigator expects to achieve. In describing plans for transferring technology, the proposal must identify potential users and provide data on why the potential users would find the new technology useful.

3.5 Education/Public Outreach

Guidelines for this section of the proposal are given in Appendix F, Education/Public Outreach Proposals as Part of Proposals to the Deep Space Systems Program.

3.6 Implementation Plan, Management, Schedule, Basis of Cost, and Cost-Estimating Methodology

Proposers are reminded that cost may be a significant discriminator in the selection. See Sections 4.1 and 4.4 in the main body of the AO.

1. Plans for designing, developing, integrating, testing, and operating flight instrumentation and its supporting systems

   The plans must consider the interactions with the Outer Planets/Solar Probe Project as described in Section 3 of the Pluto-Kuiper Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The plans must also make specific reference to the deliveries identified in the Statement of Work submitted as part of the proposal.

This section must begin with an overview that puts the general plans in the context of the approach for managing the performance and reliability of flight instrumentation, its supporting systems, and the software. The approach for ensuring performance must be given, covering at the least:

- Potential risks to the proposed investigation and plans for mitigating those risks;
- Technology development plans and back-up plans if the technologies do not meet development needs; and
- Strategy for minimizing process variability and product variability.

The approach for assuring reliability must be given, reflecting the requirements given by the Instrument Mission Assurance and Safety Requirements document available through the Deep Space Systems Program Library at Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

The heritage of various parts of the instrumentation, supporting systems, and software must be described. For heritage at the component level, the amount of departure from "build-to-print of qualified component" must be quantified. For each high-heritage component, the past use of the component must be described along with a summary of how the proposed use of the component will differ from the past use. Also for each high-heritage component, the environment of past use must be described along with a summary of how the environment of this proposed use will differ from the environment of past use. For each high-heritage component, the status of the source of heritage must also be given. If the source of heritage has not completed a qualification program, the heritage must be identified as "potential heritage" even though the level of heritage may be high. For flight hardware components with high heritage, compare the mass, power, and volume of the proposed component with the mass, power, and volume of the source of heritage. For claims of heritage at higher levels of integration, similar information must be included in the description.

For any level of heritage claimed, cost information about the referenced sources of heritage will be required in the section on cost-estimating methodology.

This discussion must include the top 3-5 risks and descoping strategies, if relevant. Descope plans must also include a description of their impacts on the attainment of the science objectives and on resource requirements.

The section must include a description of the plans for design and systems engineering of the flight instrumentation, supporting systems, and software. The approach to working with the spacecraft and mission design team must be given, and the proposers must describe their capabilities for concurrent engineering.

Fabrication processes must be described, including the team's "in-house" fabrication capability and the availability of capable vendors. The approach to assembly, integration and test for the flight instrumentation, supporting systems, and software must be given--both for the development of the instrumentation and for integration with the spacecraft.

2. Management and Schedule

This section must summarize the investigator's proposed management approach, putting it in the context of the work to be accomplished. A Work Breakdown Structure (WBS) must be presented that covers the entire effort of the investigation.

The management organization (including an organization chart) and decision-making process must be described, and the teaming arrangement (as known) must be discussed. The responsibilities of team members, including contributors, and institutional commitments must be discussed. Unique capabilities that each team member organization brings to the team, as well as previous experience with similar systems and equipment, must be addressed. The specific roles and responsibilities of the Principal Investigator and Project Manager must be described. Management strategies must be described for the control, allocation, and release of technical, cost, and schedule reserves and margins. When contracts are required, the acquisition strategy, including the incentive strategy, must be described.

A proposal may designate a Co-I at an institution other than that of the PI as an *Institutional PI* if the Co-I is making a major contribution to the proposal (e.g., a substantial portion of an investigation's instrumentation) and who serves as the point of contact at the Co-I's institution. (Note: In some cases, NASA or JPL may elect to provide an award directly to that Co-I institution with the Institutional PI serving as the "PI" for what otherwise would be a subcontract from the proposing PI institution. However, in this case, the proposal's designated PI is still held responsible by NASA for the overall scientific direction of the proposed effort.)

An investigation schedule covering all phases of the investigation must be provided, along with a more detailed, development schedule covering contract start (nominally as a JPL subcontract) through launch plus 30 days. The development schedule must include, as a minimum, major project review dates; instrument development; instrument-to-spacecraft integration and test; launch vehicle integration; launch operations; and postlaunch checkout of the instrumentation. Schedule reserve in the development schedule must be clearly identified, and the relationship between the work and the schedule must be explained.

3. Basis of Cost and Cost-Estimating Methodology

   This section must provide a narrative explanation of the cost and the budget presented in the proposals cost and budget tables.

   The methodology used to estimate the cost--for example, specific cost model, past performance, or cost estimating relationships from analogous missions--must be discussed. Budget reserve strategy, including budget reserve levels as a function of mission phase, must be discussed. Please provide assumptions used in developing cost estimates to help facilitate the reviewers' understanding of proposed cost estimates. Also, the proposal must provide cost information (in FY 2000, fixed year dollars) about any items that provide heritage to the investigation.

4. Impact of accelerated schedule

   This part of the proposal must describe what changes would be made in the proposed effort if a decision were made in December 1999, to accelerate the Pluto-Kuiper Express schedule by 13 months. You would be required to deliver the flight instrumentation, supporting equipment, and documentation by August 1, 2002, and be ready to support a launch in November 2003. Discuss briefly the factors affecting the investigation's readiness for an early launch.

5. Relaxation of Cost and Schedule Drivers

   Proposers are encouraged to identify any implementation requirements in this AO that are significant cost and/or schedule drivers and that could be relaxed with minimal increase in the risk of unsuccessful implementation and operation. The estimated cost and/or schedule savings possible by relaxing each such requirement must be given.

6. International Participation

   Proposals which include international participation, either through involvement of foreign nationals and/or involvement of foreign entities must include 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. 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 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 through Internet URLs 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, 22 CFR 120-130, *et seq*.

3.7 Cost and Budget Tables

This section shall include an estimated cost of the investigation that encompasses all proposed activities, divided into two budgets--one for the development phase (up through launch plus 30 days) and one for the operations phase. The budget line items must correspond to the elements at the second level of the proposed Work Breakdown Structure with one budget line summarizing the E/PO effort. Details of the E/PO budget are to be included in the E/PO proposal following the guidelines in Appendix F.

The amount required in each fiscal year must be identified by providing the data in Table 3 (development) and Table 4 (operations). Each budget must be presented twice, once in real year dollars and once in fixed, Fiscal Year 2000 dollars. Table 5 gives the inflation model that must be used in converting from real year dollars to Fiscal Year 2000 dollars. These amounts must represent the need for new budget authority allotted to the contract (nominally a JPL subcontract) in each fiscal year.

3.8 Resumes

Resumes or curriculum vitae must be provided for all science team members identified in the science section and for other key personnel. Each resume must clearly show experience related to the job the individual will perform on the proposed investigation. Resumes or curriculum vitae must not exceed two pages in length for each participant.

3.9 Statements of Commitment from Co-Investigators

Every Co-I and Collaborator from a U.S. as well as a non-U.S. institution identified as a participant in the proposal must submit a brief, signed statement of commitment that acknowledges his/her participation, even if he/she is from the PI's own institution. In the case

of more than one Co-I and/or Collaborator, a single, multiply-signed statement is acceptable. Each statement must be addressed to the PI, may be a facsimile or E-mail, and must contain the following, or approximately similar, language:

> "I(we) acknowledge that I(we) am(are) identified by name as Co-Investigator(s) [or Collaborator(s)] to the investigation entitled <*name of proposal*> that is submitted by <*name of Principal Investigator*> to the Pluto-Kuiper Express opportunity of the Outer Planets AO, and that I(we) intend to carry out all responsibilities identified for me(us) in this proposal. I(we) understand that the extent and justification of my(our) participation as stated in this proposal will be evaluated during peer review in determining the merits of this proposal."

In case of E-mail statements, names typed after the statement will be construed as signatures.

3.10 Letters of Endorsement

Letters of endorsement must be provided from <u>all</u> organizations offering goods and/or services on a no-exchange-of-funds basis, including non-U.S. organizations providing hardware or software to the investigation. Letters of endorsement must be signed by institutional and/or Government officials authorized to commit their organizations to participation in the proposed investigation. Copies of faxed or E-mailed letters from non-U.S. participants may be substituted in the submitted proposals as long as signed letters are received by the date and time specified in Section 1.3 of the AO. Non-U.S. organizations must submit the original letters to:

Ms. Wavalene Barnes-Hill
Ref: Pluto-Kuiper Express Mission
Space Science and Aeronautics Division
Code IS
National Aeronautics and Space Administration
Washington, DC 20546-0001
Phone: (202) 358-0900

with a copy to the address given in Section 4.3 of this appendix.

Table 3. Development phase budget profile template (submit this table twice, once in real year dollars and once in fixed, FY 2000 dollars)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**	FY00	FY01	FY02	FY03	FY04	FY05	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 4. Operations phase budget profile template (also submitted twice)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**	FY05	FY06	FY07	...	FY13	FY14	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 5. NASA New Start inflation index

Fiscal Year	2000	2001	2002	2003	2004	2005
Inflation over previous year	3.2%	3.1%	3.1%	3.1%	3.1%	3.1%
Cumulative Inflation Index over FY 2000	1.000	1.031	1.063	1.096	1.130	1.165

Use an inflation rate of 3.1% for years beyond 2005.

3.11 Contractual Statements of Work

For investigations managed from non-Government institutions, provide a Statement of Work to be used in a JPL subcontract with the investigator. For investigations managed from Government institutions, provide a Statement of Work as if the institution were non-Government. The Statement of Work must include general task statements for the development phase and for the operations phase of the investigation. All Statements of Work must include the following as a minimum: Scope of Work, Deliverables (including science data), and Government Responsibilities (as applicable). Statements of Work need not be more than a few pages in length. If more than one contractual arrangement between NASA and the proposing team is required, funding information must be provided which identifies how funds are to be allocated among the organizations.

The Statement of Work must make specific reference to the delivery of documentation and other deliverables as described in Section 3 of the Pluto-Kuiper Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

3.12 NASA PI Hardware Selection Process

Proposals that have NASA employees as Principal Investigators must contain the following information concerning the process by which non-Government participants were included in the proposal. The proposal must (i) indicate that the supplies or services of the proposed non-Government participant(s) are available under an existing NASA contract; (ii) make it clear that the capabilities, products, or services of these participant(s) are sufficiently unique to justify a sole source acquisition; or (iii) describe the open process that was used for selecting proposed team members. While a formal solicitation is not required, the process cited in (iii) must include at least the following competitive aspects: notice of the opportunity to participate to potential sources; submissions from and/or discussions with potential sources; and objective criteria for selecting team members among interested sources. The proposal must address how the selection of the proposed team members followed the objective criteria and is reasonable from both a technical and cost standpoint. The proposal must also include a representation that the Principal Investigator has examined his/her financial interests in or concerning the proposed team members and has determined that no personal conflict of interest exists. The proposal must provide a certification by a NASA official superior to the Principal Investigator verifying the process for selecting contractors as proposed team members, including the absence of conflicts of interest.

Proposals that do not have NASA employees as Principal Investigators do not have to contain this information.

3.13 References

This section may provide a list of reference documents used in the proposal. The documents themselves cannot be submitted, except as a part of the proposal and included within the prescribed page count.

3.14 Acronym List

Inclusion of an acronym list is optional.

4. Submittal Information

4.1 Notice of Intent to Propose

NASA strongly encourages that all prospective proposers submit a Notice of Intent in accordance with the schedule in Section 1.3 of the body of the AO. Proposers must prepare this Notice of Intent in English and submit it electronically using the form found at Internet URL http://cass.jsc.nasa.gov/panel/. Anyone experiencing difficulty with this process must call the Lunar and Planetary Institute for assistance at (281) 486-2137.

4.2 Electronic Cover Page

The cover page for each proposal must be prepared electronically following the instructions in Section 3 of this appendix. The form can be found at Internet URL http://cass.jsc.nasa.gov/panel/. Again, anyone experiencing difficulty with this process must call the Lunar and Planetary Institute for assistance at (281) 486-2137.

4.3 Submittal Address

Proposals must be delivered to:

Pluto-Kuiper Express Program
The Lunar and Planetary Institute
3600 Bay Area Boulevard
Houston, TX 77058
(Delivery phone: 281-486-2189)

by the due date given in Section 1.3 of the body of the AO.

5. Certifications

The following pages contain, for reference only, copies of the three currently required Certifications. Note that the signature of the Authorizing Institutional Representative on the printed copy of the Cover Page submitted with the proposal now verifies that the proposing organization complies with these Certifications; therefore, these Certifications do not have to be independently signed and submitted as in previous Announcements of Opportunity.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, 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:
   (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
   (b) 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;
   (c) 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
   (d) 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.

Certification Regarding Lobbying

(1) 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.

(2) 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.

(3) 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.

Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs

The *(Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "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 1962 (20 U.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 give 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 such property, any transferee, for the period during which the real property or structure is used for a purpose for which the 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 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, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized 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.

NASA Form 1206

Appendix D

Guidelines for Proposal Preparation

for the

Solar Probe Mission

APPENDIX D

GUIDELINES FOR PROPOSAL PREPARATION FOR THE SOLAR PROBE MISSION

TABLE OF CONTENTS

TABLE OF TABLES

APPENDIX D

GUIDELINES FOR PROPOSAL PREPARATION FOR THE SOLAR PROBE MISSION

The following guidelines apply to the preparation of proposals in response to the Solar Probe Mission part of the AO for the Deep Space Systems Program. The material is a guide for the proposer and not intended to be encompassing or directly applicable to the various types of proposals that can be submitted. The proposer is to provide information relative to those items applicable or as 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 body of the AO shall take precedence.

Proposers may find the definition of several business and management terms used in this AO, such as "New Obligation Authority" and "Work Breakdown Structure" in the Definition of Some Terms document available from the Deep Space Systems Program Library, which can be reached through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

1. General Guidelines

All documents must be typewritten in English, use metric units, and be clearly legible. Except as noted below, submission of proposal material by facsimile, electronic media, videotape, floppy disk, etc., is not acceptable. In evaluating proposals, NASA will only consider printed material. Proposals may not reference a World Wide Web site for any data or material needed to understand or evaluate the proposal.

In addition to providing the data in the printed proposals, proposers must submit a copy of the text of their proposal on either conventional, 1.4 MB, 3.5-inch diskettes or a 100 MB Zip disk that is to accompany their original, signed proposal. The text of the proposal must be either in text-only format or in Portable Document Format (PDF) while the budget data, including the headings for the rows and columns, must be either in tab-delimited text format or in Microsoft Excel workbook file format in files separate from the text of the proposal. The diskettes and Zip disks may be either PC-compatible or Macintosh-compatible and must be labeled with the title of the proposal and the PI's name.

The proposal must consist of only one volume, with readily identified sections corresponding to items 3.1 through 3.14 below. Note the page count requirements for the various sections specified in Tables 1 and 2.

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.). 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) must 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. A 3-ring binder is acceptable for the original signed copy. The other copies for review must be stapled but not otherwise bound.

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. See Tables 1 or 2 depending on the type of proposal being submitted. 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 on 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 1. Page limits for proposals to develop and use a complete package of *in situ* instrumentation or a complete package of remote sensing instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	25
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

Table 2. Page limits for proposals to develop and use other flight instrumentation

Section of Proposal	Section of Guidance	Page Limits
Cover Page/Investigation Summary	3.1	Use printed web form
Table of Contents	3.2	No limit
Description of Scientific Investigation	3.3	20
Plan for Technology Infusion and Technology Transfer	3.4	5
Education/Public Outreach	3.5	4, use printed web form
Implementation Plan, Management, Schedule, Basis of Cost and Cost Estimating Methodology	3.6	20
Appendices: (No others permitted) Cost and budget tables Resumes (2 pages maximum each) Statements of commitment from Co-Investigators Letter(s) of Endorsement Contractual Statement(s) of Work NASA PI Hardware Selection Process References Acronyms List (optional)	3.7 through 3.14	No page limit, but small size encouraged

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

3. Contents of Proposals

The content of each proposal is described below. Proposals can be submitted for a complete package or for other flight instrumentation (*e.g.* a single instrument). Flight instrumentation offered as part of the proposal is considered a "complete package" if the proposed instrumentation can be used to meet approximately as much of the Solar Probe Group 1 objectives as either 1) a set of instruments that meets the *in situ* measurement objectives given in Section 2.1.3.1 of the Solar Probe Mission and Project Description document, 2) a set of instruments that meets the remote sensing measurement objectives given in Section 2.1.3.2 of

the document, or 3) a set of instruments that meets both sets of measurement objectives. (The Solar Probe Mission and Project Description document is available through the Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.) Other techniques may be proposed for which these measurement objectives may not be directly applicable, but in order to be considered a "complete package," a proposed set of instrumentation must permit investigations that can achieve approximately as much (or more) of the Group 1 science objectives as could be achieved with the reference measurement objectives. Proposals offering to develop and use a complete package of *in situ* and/or remote sensing instrumentation are allowed somewhat more pages for describing their investigations than other proposals that might be submitted. (See Tables 1 and 2.)

3.1 Cover Page/Investigation Summary

All proposals must be prefaced by an integrated Cover Page/Proposal Summary that contains important, required information (see below). Produce this item by first entering the requested information electronically through the World Wide Web site given in Section 4.2 of this appendix. Section 4.2 of this appendix also provides a point of contact for any proposer who does not have access to the Web or who experiences difficulty in using the specified site. Use a printed copy of the electronically submitted form to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, use reproductions of this original *Cover Page/Proposal Summary* to preface the required printed copies of the proposal.

The names, addresses, telephone and fax numbers, and electronic mail addresses of the Principal Investigator, all Co-Investigators, and the authorizing official shall be included. In addition, the electronic *Cover Page/Proposal Summary* form will provide a block of space (about one page in length) for a self-contained Proposal Summary of the proposed research activity. The Proposal Summary is intended to provide background and perspective to the interested reader and, therefore, must include the following key information:

- A description of the key, central objectives of the proposed research in terms sufficient for a nonspecialist not familiar with the document to grasp its essence;

- A statement of methods proposed to accomplish those proposed objectives; and

- The perceived significance of the proposed investigation to NASA OSS interests.

Note: NASA intends to publish the proposal title, the PI name and institution, and the Proposal Summary of every selected investigation in a public data base. Therefore, the Proposal Summary must not include proprietary information that would preclude its unrestricted release (see also Appendix A, Section 5).

Changes (such as whiteout or strikethrough) to the printed Cover Page/Proposal Summary are not permitted. The proposer may make needed changes to the information submitted electronically only by editing the electronic submission following the instructions at the World Wide Web site given in Section 4.2 of this appendix. After submitting the final Cover Page/Proposal Summary electronically, the proposer must then print the correct and final version and obtain the necessary signatures.

Note: The authorizing institutional signature now also certifies that the proposing institution has read and is in compliance with the three required certifications printed in full at the end of this appendix. NASA does not, therefore, require institutions to submit these certifications with the proposal.

3.2 Table of Contents

The proposal must contain a table of contents that parallels the outline provided below in Sections 3.3 through 3.14.

3.3 Description of Scientific Investigation

The description must cover the scientific objectives of the proposed investigation, the quantity and quality of data needed in order to perform the investigation, how the Solar Probe mission and the proposed instrumentation will acquire the needed data, operational constraints that must be met while acquiring 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 understanding of the Sun and its atmosphere. It must describe the history and basis for the proposal and must discuss the need for such an investigation. This section must also include a quantitative analysis of how the proposed investigation addresses each of the Group 1 objectives and any applicable Group 2 or Group 3 objectives for the Solar Probe.

2. Science Implementation. This section must describe how the investigation will accomplish its goals and objectives. The description must include an overview of how the mission and instruments will acquire the data for the investigation. The quality of the data to be returned (resolution, coverage, etc.) and the quantity of data to be returned must be described. The relationship linking the data products, measurement objectives, and the investigation's scientific goals and objectives must be described quantitatively.

This section must also describe the instrumentation. The required performance and the expected margins in performance must be covered. In describing the instrumentation, the proposal must present the scheme for ensuring that optics, sensors, electronics, and other parts of the flight instrumentation will withstand the anticipated space environment through the nominal mission. There must also be a description of the resources required by the instrumentation, the margins planned for these resources, and a comparison of the requirements to the limits on the resources given in Section 3.1 of the Solar Probe Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. Any use of radioactive sources within the proposed instrumentation must be identified and characterized. For proposals that are not offering "complete packages," resource requirements must be the minimum that would permit a scientifically productive investigation, keeping in mind the relative levels of criticality for the resources given in Section 3.1 of the Solar

Probe Mission and Project Description document. Proposers may wish to describe higher performance options for their investigation but should be aware that higher demands on resources will make it less likely that these options could be accommodated.

This section must also describe how the mission and instrumentation will work together, covering all phases of the program from selection through encounter.

The strategy for acquiring and managing data must be described, and an integrated and coordinated observing sequence must be given which puts the strategy into a practical form and includes the needs of the spacecraft and of the other science teams. The integrated and coordinated observing sequence must cover sequences of events with one-day resolution as necessary for events leading up to encounter and must cover sequences of events on a daily basis for the "Inner Heliosphere" and "Near Encounter" phases for both flybys of the Sun. The observing sequence must integrate all the observations of the proposed instrumentation in order to meet the scientific objectives proposed for the specific investigation. The observing sequence must coordinate the observations with other Group 1 investigation requirements and mission operations requirements given in Section 2 of the Solar Probe Mission and Project Description document. Proposals must provide enough detail to demonstrate the capability of the mission to accomplish their data collection and management activities in the context of the activities of the entire mission.

This section must also describe how the data will be analyzed and archived. In addition to descriptions of the various data products, the plans for equipment and staffing must be given, along with the rationale for the plans. The plans for releasing data to the public domain must be described.

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.

Finally, this section must also describe the science team, their responsibilities, their relevant experience, and, if appropriate, how their experience is relevant to their responsibilities. The strategy for maintaining expertise during the long time from launch through the second flyby of the Sun must be described.

3.4 Plan for Technology Infusion and Technology Transfer

This section must describe both the extent to which the proposed investigation will advance the state of the art through the infusion of new technology and the plans for transferring advanced technology associated with the investigation to other potential users in the United States. In describing the infusion of technology, the proposal must provide references to the state of the art and metrics that quantify the degree of advancement that the investigator expects to achieve. In describing plans for transferring technology, the proposal must identify potential users and provide data on why the potential users would find the new technology useful.

3.5 Education/Public Outreach

Guidelines for this section of the proposal are given in Appendix F, Education/Public Outreach Proposals as Part of Proposals to the Deep Space Systems Program.

3.6 Implementation Plan, Management, Schedule, Basis of Cost, and Cost-Estimating Methodology

Proposers are reminded that cost may be a significant discriminator in the selection. See Sections 4.1 and 4.4 in the main body of the AO.

1. Plans for designing, developing, integrating, testing, and operating flight instrumentation and its supporting systems

   The plans must consider the interactions with the Outer Planets/Solar Probe Project as described in Section 3 of the Solar Probe Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets. The plans must also make specific reference to the deliveries identified in the Statement of Work submitted as part of the proposal.

This section must begin with an overview that puts the general plans in the context of the approach for managing the performance and reliability of flight instrumentation, its supporting systems, and the software. The approach for ensuring performance must be given, covering at the least:

- Potential risks to the proposed investigation and plans for mitigating those risks;
- Technology development plans and back-up plans if the technologies do not meet development needs; and
- Strategy for minimizing process variability and product variability.

The approach for assuring reliability must be given, reflecting the requirements given by the Instrument Mission Assurance and Safety Requirements document available through the Deep Space Systems Program Library at Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

The heritage of various parts of the instrumentation, supporting systems, and software must be described. For heritage at the component level, the amount of departure from "build-to-print of qualified component" must be quantified. For each high-heritage component, the past use of the component must be described along with a summary of how the proposed use of the component will differ from the past use. Also for each high-heritage component, the environment of past use must be described along with a summary of how the environment of this proposed use will differ from the environment of past use. For each high-heritage component, the status of the source of heritage must also be given. If the source of heritage has not completed a qualification program, the heritage must be identified as "potential heritage" even though the level of heritage may be high. For flight hardware components with high heritage, compare the mass, power, and volume of the proposed component with the mass, power, and volume of the source of heritage. For claims of heritage at higher levels of integration, similar information must be included in the description.

For any level of heritage claimed, cost information about the referenced sources of heritage will be required in the section on cost-estimating methodology.

This discussion must include the top 3-5 risks and descoping strategies, if relevant. Descope plans must also include a description of their impacts on the attainment of the science objectives and on resource requirements.

The section must include a description of the plans for design and systems engineering of the flight instrumentation, supporting systems, and software. The approach to working with the spacecraft and mission design team must be given, and the proposers must describe their capabilities for concurrent engineering.

Fabrication processes must be described, including the team's "in-house" fabrication capability and the availability of capable vendors. The approach to assembly, integration and test for the flight instrumentation, supporting systems, and software must be given--both for the development of the instrumentation and for integration with the spacecraft.

2. Management and Schedule

This section must summarize the investigator's proposed management approach, putting it in the context of the work to be accomplished. A Work Breakdown Structure (WBS) must be presented that covers the entire effort of the investigation.

The management organization (including an organization chart) and decision-making process must be described, and the teaming arrangement (as known) must be discussed. The responsibilities of team members, including contributors, and institutional commitments must be discussed. Unique capabilities that each team member organization brings to the team, as well as previous experience with similar systems and equipment, must be addressed. The specific roles and responsibilities of the Principal Investigator and Project Manager must be described. Management strategies must be described for the control, allocation, and release of technical, cost, and schedule reserves and margins. When contracts are required, the acquisition strategy, including the incentive strategy, must be described.

A proposal may designate a Co-I at an institution other than that of the PI as an *Institutional PI* if the Co-I is making a major contribution to the proposal (e.g., a substantial portion of an investigation's instrumentation) and who serves as the point of contact at the Co-I's institution. (Note: In some cases, NASA or JPL may elect to provide an award directly to that Co-I institution with the Institutional PI serving as the "PI" for what otherwise would be a subcontract from the proposing PI institution. However, in this case, the proposal's designated PI is still held responsible by NASA for the overall scientific direction of the proposed effort.)

An investigation schedule covering all phases of the investigation must be provided, along with a more detailed, development schedule covering contract start (nominally a JPL subcontract) through launch plus 30 days. The development schedule must include, as a minimum, major project review dates; instrument development; instrument-to-spacecraft integration and test; launch vehicle integration; launch operations; and postlaunch checkout of the instrumentation. Schedule reserve in the development schedule must be clearly identified, and the relationship between the work and the schedule must be explained.

3. Basis of Cost and Cost-Estimating Methodology

   This section must provide a narrative explanation of the cost and the budget presented in the proposals cost and budget tables.

   The methodology used to estimate the cost--for example, specific cost model, past performance, or cost estimating relationships from analogous missions--must be discussed. Budget reserve strategy, including budget reserve levels as a function of mission phase, must be discussed. Please provide assumptions used in developing cost estimates to help facilitate the reviewers' understanding of proposed cost estimates. Also, the proposal must provide cost information (in FY 2000, fixed year dollars) about any items that provide heritage to the investigation.

4. Relaxation of Cost and Schedule Drivers

   Proposers are encouraged to identify any implementation requirements in this AO that are significant cost and/or schedule drivers and that could be relaxed with minimal increase in the risk of unsuccessful implementation and operation. The estimated cost and/or schedule savings possible by relaxing each such requirement must be given.

5. International Participation

   Proposals which include international participation, either through involvement of foreign nationals and/or involvement of foreign entities must include 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. 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 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 through Internet URL's 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, 22 CFR 120-130, *et seq*.

3.7 Cost and Budget Tables

This section shall include an estimated cost of the investigation that encompasses all proposed activities, divided into two budgets--one for the development phase (up through launch plus 30 days) and one for the operations phase. The budget line items must correspond to the elements at the second level of the proposed Work Breakdown Structure with one budget line summarizing the E/PO effort. Details of the E/PO budget are to be included in the E/PO proposal following the guidelines in Appendix F.

The amount required in each fiscal year must be identified by providing the data in Table 3 (development) and Table 4 (operations). Each budget must be presented twice, once in real year dollars and once in fixed, Fiscal Year 2000 dollars. Table 4 gives the inflation model that must be used in converting from real year dollars to Fiscal Year 2000 dollars. These amounts must represent the need for new budget authority allotted to the contract (nominally a JPL subcontract) in each fiscal year.

3.8 Resumes

Resumes or curriculum vitae must be provided for all science team members identified in the science section and for other key personnel. Each resume must clearly show experience related to the job the individual will perform on the proposed investigation. Resumes or curriculum vitae must not exceed two pages in length for each participant.

3.9 Statements of Commitment from Co-Investigators

Every Co-I and Collaborator from a U.S., as well as a non-U.S., institution identified as a participant in the proposal must submit a brief, signed statement of commitment that acknowledges his/her participation, even if he/she is from the PI's own institution. In the case of more than one Co-I and/or Collaborator, a single, multiply-signed statement is acceptable. Each statement must be addressed to the PI, may be a facsimile or E-mail, and must contain the following, or approximately similar, language:

> "I(we) acknowledge that I(we) am(are) identified by name as Co-Investigator(s) [or Collaborator(s)] to the investigation entitled <*name of proposal*> that is submitted by <*name of Principal Investigator*> to the Solar Probe opportunity of the Outer Planets AO, and that I(we) intend to carry out all responsibilities identified for me(us) in this proposal. I(we) understand that the extent and justification of my(our) participation as stated in this proposal will be evaluated during peer review in determining the merits of this proposal."

In case of E-mail statements, names typed after the statement will be construed as signatures.

Table 3. Development phase budget profile template (submit this table twice, once in real year dollars and once in fixed, FY 2000 dollars)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**	FY00	FY01	FY02	FY03	...	FY07	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 4. Operations phase budget profile template (also submitted twice)

(FY NOA* in Real Year <FY 2000> Dollars, Totals in Real Year <FY 2000> Dollars)

Cost Element**	FY07	FY08	FY09	...	FY15	FY16	Total (Real Yr.)
NASA-provided budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total NASA	$	$	$	$	$	$	$
Contributed budget authority							
WBS Element 1							
WBS Element 1.1							
...							
Total Contributions	$	$	$	$	$	$	$
Total authority (NASA plus contributions)							
WBS Element 1							
WBS Element 1.1							
...							
Total all sources	$	$	$	$	$	$	$

* NOA (new obligation authority) must include all costs including any fees
** Cost elements go to Level 2 of the proposed Work Breakdown Structure

Table 5. NASA New Start inflation index

Fiscal Year	2000	2001	2002	2003	2004	2005
Inflation over previous year	3.2%	3.1%	3.1%	3.1%	3.1%	3.1%
Cumulative Inflation Index over FY 2000	1.000	1.031	1.063	1.096	1.130	1.165

Use an inflation rate of 3.1% for years beyond 2005.

3.10 Letters of Endorsement

Letters of endorsement must be provided from all organizations offering goods and/or services on a no-exchange-of-funds basis, including non-U.S. organizations providing hardware or software to the investigation. Letters of endorsement must be signed by institutional and/or Government officials authorized to commit their organizations to participation in the proposed investigation. Copies of faxed or E-mailed letters from non-U.S. participants may be substituted in the submitted proposals as long as signed letters are received by the date and time specified in Section 1.3 of the AO. Non-U.S. organizations must submit the original letters to:

Ms. Wavalene Barnes-Hill
Ref: Solar Probe Mission
Space Science and Aeronautics Division
Code IS
National Aeronautics and Space Administration
Washington, DC 20546-0001
Phone: (202) 358-0900

with a copy to the address given in Section 4.4 of this appendix.

3.11 Contractual Statements of Work

For investigations managed from non-Government institutions, provide a Statement of Work to be used in a JPL subcontract with the investigator. For investigations managed from Government institutions, provide a Statement of Work as if the institution were non-Government. The Statement of Work must include general task statements for the development phase and for the operations phase of the investigation. All Statements of Work must include the following as a minimum: Scope of Work, Deliverables (including science data), and Government Responsibilities (as applicable). Statements of Work need not be more than a few pages in length. If more than one contractual arrangement between NASA and the proposing team is required, funding information must be provided which identifies how funds are to be allocated among the organizations.

The Statement of Work must make specific reference to the delivery of documentation and other deliverables as described in Section 3 of the Solar Probe Mission and Project Description document, available through the online, Deep Space Systems Program Library, which can be accessed through Internet URL http://outerplanets.LaRC.NASA.gov/outerplanets.

3.12 NASA PI Hardware Selection Process

Proposals that have NASA employees as Principal Investigators must contain the following information concerning the process by which non-Government participants were included in the proposal. The proposal must (i) indicate that the supplies or services of the proposed non-Government participant(s) are available under an existing NASA contract; (ii) make it clear that the capabilities, products, or services of these participant(s) are sufficiently unique to justify a sole source acquisition; or (iii) describe the open process that was used for selecting proposed team members. While a formal solicitation is not required, the process cited in (iii) must include at least the following competitive aspects: notice of the opportunity to participate to potential sources; submissions from and/or discussions with potential sources; and objective criteria for selecting team members among interested sources. The proposal must address how the selection of the proposed team members followed the objective criteria and is reasonable from both a technical and cost standpoint. The proposal must also include a representation that the Principal Investigator has examined his/her financial interests in or concerning the proposed team members and has determined that no personal conflict of interest exists. The proposal must provide a certification by a NASA official superior to the Principal Investigator verifying the process for selecting contractors as proposed team members, including the absence of conflicts of interest.

Proposals that do not have NASA employees as Principal Investigators do not have to contain this information.

3.13 References

This section may provide a list of reference documents used in the proposal. The documents themselves cannot be submitted, except as a part of the proposal and included within the prescribed page count.

3.14 Acronym List

Inclusion of an acronym list is optional.

4. Submittal Information

4.1 Notice of Intent to Propose

NASA strongly encourages that all prospective proposers submit a Notice of Intent in accordance with the schedule in Section 1.3 of the body of the AO. Proposers must prepare this Notice of Intent in English and submit it electronically using the form found at Internet URL http://props.oss.hq.nasa.gov/. Anyone experiencing difficulty with this process must call Ms. Deb Tripp at Jorge Scientific for assistance at (202) 554-2775 or E-mail: dtripp@HQ.NASA.gov.

4.2 Electronic Cover Page

The cover page for each proposal must be prepared electronically following the instructions in Section 3 of this appendix. The form can be found at Internet URL http://props.oss.hq.nasa.gov/.

4.3 Submittal Address

Proposals must be delivered to:

Solar Probe Support Office
Jorge Scientific Corporation
400 Virginia Avenue, SW, Suite 700
Washington DC 20024
(Delivery phone: 202-554-2775)

by the due date given in Section 1.3 of the body of the AO.

5. Certifications

The following pages contain, for reference only, copies of the three currently required Certifications. Note that the signature of the Authorizing Institutional Representative on the printed copy of the Cover Page submitted with the proposal now verifies that the proposing organization complies with these Certifications; therefore, these Certifications do not have to be independently signed and submitted as in previous Announcements of Opportunity.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, 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:
   (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
   (b) 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;
   (c) 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
   (d) 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.

Certification Regarding Lobbying

(1) 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.

(2) 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.

(3) 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.

Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs

The *(Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "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 1962 (20 U.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 give 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 such property, any transferee, for the period during which the real property or structure is used for a purpose for which the 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 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, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized 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.

NASA Form 1206

Appendix E

Deep Space Systems Program Library

APPENDIX E

DEEP SPACE SYSTEMS PROGRAM LIBRARY

These documents are available through the Deep Space Systems Library. The Library can be accessed over the Internet through URL http://outerplanets.LaRC.NASA.gov/outerplanets.

Documents in the Deep Space Systems Program Library

Deep Space Systems Program Description

Europa Orbiter Mission and Project Description

Pluto-Kuiper Express Mission and Project Description

Solar Probe Mission and Project Description

Description Of X2000 Components Available For Use In Instrument Proposals

Environmental Requirements

Europa Orbiter Preliminary Planetary Protection Requirements

Instrument Mission Assurance And Safety Requirements

Sample Form: Materials Identification and Usage List

State of Knowledge of Europa--Taken From the Europa Science Definition Team Report

State of Knowledge of the Pluto-Charon System--Taken from the Pluto Science Definition Team Report

State of Knowledge of the Sun--Taken from the Solar Probe Science Definition Team Report

Regulations Governing the Procurement of Foreign Goods or Services

Definitions of Some Terms

Questions and Answers about the Outer Planets Announcement of Opportunity

Appendix F

Education/Public Outreach Proposals

as Part of

Proposals to the Deep Space Systems Program

APPENDIX F

EDUCATION AND PUBLIC OUTREACH

1. Scope of Program

The Office of Space Science (OSS) has developed a comprehensive approach for making education at all levels (with a particular emphasis on K-14 education) and the enhancement of public understanding of space science integral parts of all of its missions and research programs. 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 Education and Public Outreach Into NASA's Space Science Programs* (March 1995), and an implementation plan, entitled *Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy* (October 1996). Both of these documents may be obtained either by selecting Education and Public Outreach from the menu on the OSS homepage at *http://spacescience.nasa.gov*, or from Dr. Jeffrey Rosendhal, Code S, Office of Space Science, NASA Headquarters, Washington, DC 20546-0001.

In accord with these established OSS policies, Instrument Investigation proposers to this AO are required to include an Education/Public Outreach (E/PO) program as part of their proposal. In keeping with this policy, proposed E/PO activities should be budgeted at one to two percent per year of the cost of the proposed investigation. E/PO proposals will be evaluated (see criteria below) by appropriately qualified scientific, education, and outreach personnel, and the results of those evaluations will be considered by the OSS Selecting Official as a part of the overall evaluation and selection process. E/PO will serve as one of the factors to be used in discriminating among proposals having otherwise comparable scientific and technical merits.

Science Team Member investigations for the Europa Orbiter Mission selected through this AO will be expected to participate actively in a common Deep Space Systems Education/Public Outreach program and must make provisions to do so as part of their proposals (see Section 2.6) but they do not have to submit a separate E/PO element. However, prospective Science Team members must include provisions for the costs of participating in the common E/PO effort as part of their proposed budget. Such costs may include items such as travel, planning time, level-of-effort participation in the implementation of the common program, and costs associated with the development of appropriate supporting materials.

Following selection of investigations, all investigator teams will be expected to work together to create, design, plan, and implement a coordinated and integrated program of Education/Public Outreach activities for this mission opportunity. Such a program may involve coordination of individually proposed E/PO efforts, the development of appropriate collaborative activities, and/or the identification of new E/PO opportunities that build on and/or extend the unique capabilities, connections, partnerships, and resources that are brought into the mission by individual selected investigations. Development of plans for such a coordinated E/PO program will be part of the Phase A study activity.

2. Evaluation Criteria

There are two classes of evaluation criteria against which proposed E/PO activities will be evaluated. The general criteria to be applied to the evaluation of all proposals, which reflect requirements necessary for further consideration of a proposal, are:

- The quality, scope, and realism of the proposed E/PO program including the adequacy , appropriateness, and realism of the proposed budget;
- The capability and commitment of the proposer and the proposer's team and the direct involvement of one or more science team members in overseeing and carrying out the proposed E/PO program;
- The establishment or continuation of effective partnerships with institutions and/or personnel in the fields of education and/or public outreach as the basis for and an integral element of the proposed E/PO program;
- The adequacy of plans for evaluating the effectiveness and impact of the proposed education/outreach activity.

To ensure that the goals and objectives of the OSS E/PO strategy are realized in practice, proposals will also be evaluated using the following specific criteria. Based on the funding guidelines given elsewhere in this AO, the E/PO programs submitted in response to this Announcement will involve the expenditure of substantial resources. Therefore, it is expected that proposed E/PO programs will have a breadth and depth commensurate with these resources. Such programs are expected to be multi-faceted in nature, address a number of different aspects of education and outreach contained in the specific criteria, and have state, regional, or national scope. The specific E/PO criteria are:

- For proposals dealing directly with or strongly affecting the formal education system (e.g., through teacher workshops or student programs carried out at informal education institutions such as science museums and planetariums), the degree to which the proposed E/PO effort is aligned with and linked to nationally recognized and endorsed education reform efforts and/or reform efforts at the state or local levels;

- The degree to which the proposed E/PO effort contributes to the training of, involvement in, and broad understanding of science and technology by underserved and/or underutilized groups;
- The potential for the proposed E/PO activity to expand its scope by having an impact beyond the direct beneficiaries, reaching large audiences, being suitable for replication or broad dissemination, or drawing on resources beyond those directly requested in the proposal.

Although creativity and innovation are certainly encouraged, note that neither of these sets of criteria focuses on the originality of the proposed effort. Instead, NASA seeks assurance that the proposer is personally committed to the E/PO effort and the PI and/or appropriate research team members will actively be involved in carrying out a meaningful, effective, credible, and appropriate E/PO activity; that such an activity has been planned and will be executed; and that the proposed investment of resources will make a significant contribution toward meeting OSS E/PO plans and objectives.

To aid proposers in the preparation of their proposals, as well as to ensure that reviews are carried out on a consistent basis aligned with the OSS Education Strategy and Implementation Plan, an *Explanatory Guide* to the E/PO evaluation criteria has been prepared and may be found by linking through *Education and Public Outreach* at the Web site <http://www.spacescience.nasa.gov >.

3. Assistance for the Preparation of E/PO Proposals

NASA OSS has established a nation-wide infrastructure of space science education/public outreach groups whose purpose is to directly aid space science investigators in identifying and developing high quality E/PO opportunities. This infrastructure provides the coordination, background, and linkages for fostering partnerships between the space science and E/PO communities, and the services needed to establish and maintain a vital national, coordinated, long-term OSS E/PO program. Of particular interest are two elements of this system (which are also described in more detail in the OSS education/outreach implementation plan referred to above):

1. Four OSS science theme-oriented E/PO "Forums" have been established to help orchestrate and organize in a comprehensive way the education/outreach aspects of OSS space science missions and research programs, and provide both the space science and education communities with ready access to relevant E/PO programs and products; and
2. Five regional E/PO "Broker/Facilitators" to search out and establish high leverage opportunities, arrange alliances between educators and OSS-supported scientists, and help scientists turn results from space science missions and programs into educationally-appropriate activities suitable for regional and/or national dissemination

Prospective proposers are strongly encouraged to make use of these groups to help identify suitable E/PO opportunities and arrange appropriate alliances. Proposers should be careful to note that these Forums and Broker/Facilitators have been established to provide help, but the responsibility for actually developing the E/PO program and writing the proposal is that of the proposer. Points of contact and addresses for all of these E/PO Forums and Broker/Facilitators may be found by opening Education and Public Outreach from the menu of the OSS homepage at <http://www.spacescience.nasa.gov>.

4. Preparation and Submission of an E/PO Proposal

In order to be considered for evaluation, E/PO proposals must adhere to the following formats and also must be submitted both electronically and in hard copy as described below.

An E/PO proposal is to consist of a contiguous body and budget:

- The body of the E/PO proposal is limited to four pages (<17,000 characters, including spaces, using the fonts and page layouts specified in the appropriate Guidelines for Proposal Preparation appendix) and must include the following parts: a brief abstract of the proposed activity (not to exceed 800 characters); an expanded description of the E/PO objectives and planned activities; a description of the intended involvement of the Principal Investigator and/or key science team members in the proposed E/PO effort; a description of any educational personnel who are involved in the effort, including proposed partnership institutions (together with specific indicators of commitment on the part of partners where appropriate); a description of how the effort will be managed; and an explanation of the requested E/PO budget. Note that the PI or one of the science team members of the parent research proposal must have the prime responsibility for overseeing the implementation of the proposed E/PO activity. The responsible individual should be clearly identified in the body of the E/PO proposal.

- The period of performance of an E/PO activity is generally expected to coincide with that of the proposed investigation throughout all phases including the data analysis phase. The E/PO budget must be summarized for its entire intended total period of performance, as well as for each individual year thereof, using the format entitled Budget Summary for Education/Public Outreach Proposals given at the end of this Appendix (e.g., an E/PO effort proposed for a five year period of performance will require six budget sheets). In addition, this E/PO budget must be integrated into the budget for the entire proposed investigation as specified elsewhere in this AO.

- E/PO proposals (both body and budget) must be submitted by each of two separate ways:

- As an electronic submission (for the evaluation process) by uploading it, including its Budget Summary sheets, to the secure Web site http://cass.jsc.nasa.gov/panel/, which provides instructions for this activity using a wide variety of formats. Proposers without Web access or who experience difficulty in using this site may request assistance from the Lunar and Planetary Institute by E-mail at panel@lpi.jsc.nasa.gov or by phone at (281) 486-2136; and

- As part of the total hard-copy version of the research proposal (see the ordered list of component parts for proposals elsewhere in this AO).

5. Additional Information

As indicated in Section 2.6, in addition to the individual E/PO programs to be planned and implemented by selected instrument investigators, all selected investigators will be expected to participate in a common Deep Space Systems Education/Public Outreach Program to be carried out by the Deep Space Systems Project. Individual instrument investigator E/PO efforts will be coordinated with and integrated into a master Education/Public Outreach plan to be developed following selection. Questions about the Outer Planets/Solar Probe E/PO program may be directed to:

Mr. Richard Shope, Education & Outreach Coordinator
Outer Planets/Solar Probe Project
M/S: 301-160
4800 Oak Grove Drive
Pasadena, CA 91109-8099

Telephone: (818) 354-3812
E-mail: rshope@pop.jpl.nasa.gov

BUDGET SUMMARY
for
EDUCATION/PUBLIC OUTREACH PROPOSAL

For (check one):

__ Total Period of Performance from (M/D/Y) _____ to _____

/or/

__ Year ____ of ____ from (M/D/Y) _____ to _____

1. Direct Labor (salaries, wages, and fringe benefits) _____

2. Other Direct Costs:
   a. Subcontracts _____

   b. Consultants _____

   c. Equipment _____

   d. Supplies _____

   e. Travel _____

   f. Other _____

3. Facilities and Administrative Costs _____

4. Other Applicable Costs: _____

5. SUBTOTAL--Estimated Costs _____

6. Less Proposed Cost Sharing (if any) _____

8. Total E/PO Estimated Costs _____