

**Detector Definition and Instrument Assessment for an
Advanced Cosmic-ray Composition Experiment on the Space Station
(ACCESS)**

NASA Research Announcement
Soliciting Proposals
for
Basic Research

Notices of Intent Due: July 28, 1997

Proposals Due: September 29, 1997

NRA 97-OSS-13
Issued: June 27, 1997

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

Detector Definition and Instrument Assessment for an Advanced Cosmic-ray Composition Experiment on the Space Station (ACCESS)

This NASA Research Announcement (NRA) solicits proposals for detector definition and instrument assessment for an Advanced Cosmic-ray Composition Experiment on the Space Station (ACCESS) to measure the elemental composition and energy spectra of ultrahigh energy cosmic rays. Changes in the relative composition of H to Fe nuclei around 10^{15} eV are believed to hold the key to understanding the origin and acceleration limit of cosmic rays in supernova shock waves. A study focusing on the International Space Station accommodation of a calorimeter-based instrument to address these key measurements was selected by NASA in response to a previous solicitation, NRA 96-OSS-03, entitled "Space Physics New Mission Concepts." Three categories of studies that further define the ACCESS instrument to accomplish these and possibly additional objectives are solicited in this NRA: (1) detector development; (2) instrument assessment; and (3) discipline outreach.

Participation in this program is open to all categories of organizations, domestic or foreign, including educational institutions, profit and nonprofit organizations, NASA Centers, and other Government agencies. However, investigators working outside the U.S. are not eligible for funding from NASA. Proposals may be submitted according to the schedule below. Valid proposals will be evaluated by scientific peer review panels.

Further details relevant to this program are included in the appendices of this NRA. Appendix A provides the programmatic guidelines for the studies being solicited. Appendices B and C contain general and specific instructions for preparation of solicited proposals in response to this NRA. Appendix D contains standard forms that must be completed and submitted with the proposal.

The complete text of the NRA and its appendices are available through the World Wide Web in several common formats by opening "Research Opportunities" from the menu on the home page of the NASA Office of Space Science at the URL address <http://www.hq.nasa.gov/office/oss/>

Proposers without access to the Internet may request paper copies of this NRA by E-mail to debra.tripp@hq.nasa.gov or by regular mail from

ACCESS NRA
Jorge Scientific Corporation
Suite 700
400 Virginia Avenue, SW
Washington, DC 20024
Telephone: (202) 554-2775.

Financial support is offered only to U.S. investigators for activities not funded by another mechanism. It is estimated that the total funding for this two-year program will be approximately \$1.5 million. It is expected that 5 to 10 proposals will be selected for funding. In addition to proposals seeking direct funding from NASA, this NRA solicits proposals from scientists in the U.S. and in other countries who demonstrate adequate financial support from other sources.

Funds for awards under this NRA are subject to the NASA budget. The Government's obligation to make awards is contingent upon the availability of appropriated funds from which payment for award purposes can be made and the receipt of proposals which the Government determines are acceptable for award under this NRA.

Identifier: NRA 97-OSS-13

Submit Notice of Intent to: ACCESS NRA
Jorge Scientific Corporation
Suite 700
400 Virginia Avenue, SW
Washington, DC 20024

or by E-mail to: debra.tripp@hq.nasa.gov

Due date for Notice of Intent: July 28, 1997

Submit proposal to: ACCESS NRA
Jorge Scientific Corporation
Suite 700
400 Virginia Avenue, SW
Washington, DC 20024

Contact for commercial delivery: Ms. Debra Tripp
Telephone: (202) 554-2775

Proposal due date: September 29, 1997

Number of proposal copies required:
1 signed original and 11 copies,
plus 2 additional copies each of the Cover Page
and Abstract (in the specified formats)

Selecting Official: Director
Research Program Management Division
Office of Space Science

Obtain additional information from: Dr. W. Vernon Jones
Research Program Management Division
Code SR
Office of Space Science
NASA Headquarters
Washington, DC 20546-0001
E-mail: wvjones@hq.nasa.gov
Telephone: (202) 358-1588

NASA appreciates your interest and cooperation in this program to study the detector definition and instrument assessment for an advanced cosmic-ray composition experiment on the International Space Station.

Alan N. Bunner
Science Program Director
Structure and Evolution of the Universe
Office of Space Science

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Program Description

Detector Definition and Instrument Assessment for an Advanced Cosmic-ray Composition Experiment on the Space Station (ACCESS)

1. Scope of the ACCESS Study

This NASA Research Announcement (NRA) solicits proposals for detector definition and instrument assessment for an Advanced Cosmic-ray Composition Experiment on the Space Station (ACCESS). The ACCESS mission has been identified as the highest priority new start for the cosmic-ray discipline during NASA's 2000 to 2004 strategic planning period. Its primary objective is measurement of the elemental composition and energy spectra of cosmic rays from H to Fe over the range from about 10^{12} to 10^{15} eV, in order to understand the origin and acceleration limit of cosmic rays in supernova shock waves. Other high priority objectives include complementary measurements of ultra-heavy ($Z = 26$ to 92) nuclei and, if compatible, high energy ($E > 10^{12}$ eV) electrons.

The importance of these objectives for space-based research in the broad context of all high energy cosmic-ray observations is described in the National Research Council report "Opportunities in Cosmic-Ray Physics and Astrophysics," T. K. Gaisser *et al.*, Board on Physics and Astronomy (1995). This report is available on the Internet at URL address <http://www.nap.edu/readingroom/books/cosmicray>.

Another National Academy of Sciences report, "A Science Strategy for Space Physics," M. Neugebauer *et al.*, Space Studies Board Committee on Solar and Space Physics jointly with the Committee on Solar-Terrestrial Research (1995), gives a prioritized list of research activities in five topics identified as key areas for study in the next decade. Extending direct cosmic-ray composition measurements to 10^{15} eV to probe the limits of acceleration and trapping mechanisms was given the highest priority for the topic "Plasma Processes that Accelerate Very Energetic Particles and Control their Propagation." Copies of this report are available from the

Space Studies Board
National Research Council
2101 Constitution Avenue, NW
Washington, DC 20418.

A new mission concept study focusing on the International Space Station (ISS) accommodation of a calorimeter-based instrument to pursue this high priority science objective was selected by NASA in response to the Space Physics New Mission Concept solicitation NRA 96-OSS-03. That selection had the proviso that the proposed calorimeter design would be augmented with a transition radiation detector to increase both the geometry factor and the quality of the energy measurements for heavy ($Z = 3$ to 26) nuclei. The combined instrument was also to have, if practical, the capability for measuring ultra-heavy ($Z = 26$ to 92) nuclei, an objective identified in the Academy reports as a high priority probe of the plasma regions where the nuclei are synthesized, and to measure the time scales involved. The Cosmic Ray Roadmapping Committee (CRRC) appointed by NASA Headquarters was charged with the responsibility for monitoring the design of the baseline instrument used in the ISS accommodation study.

A brief description of the baseline design is available from the ACCESS home page on the Internet at URL address

<http://hep.uchicago.edu/~swordy/access.html>

This NRA solicits innovative studies that further define a mission capable of accomplishing the ACCESS objectives and additional objectives, if they do not compromise the stated primary

objective. Architectures that allocate resources differently from the baseline design may be proposed, provided that the proposer demonstrates that the alternative design would have the potential to meet or exceed the capability of the baseline design for making the required measurements within the prescribed cost, time-for-development, and physical resource constraints of the Space Shuttle and the ISS.

Three categories of studies are solicited:

1. Detector development. This NRA is appropriate for studying critical ACCESS detector technologies through design and laboratory testing, **but NOT for building flight hardware**. This includes further definition of the detector hardware described in the baseline design, alternative detector hardware compatible with the baseline design, and/or detector hardware for a different architecture.
2. Instrument assessment. This NRA is appropriate for assessing the performance of the ACCESS instrument for measuring cosmic rays. This includes, for example, modeling and simulations that further the understanding of the response of the detectors and/or the overall baseline instrument, the response of alternative detectors that would enhance and be compatible with the baseline design, and/or the response of other detectors for a different architecture.
3. Discipline outreach. This NRA is appropriate for developing discipline outreach in support of the ACCESS mission. Activities in this category might include, for example: developing a workable data management plan, consistent with NASA's policy of no proprietary data rights, for having all ACCESS data products validated and documented so they are useful in the public domain after a brief, appropriate validation period; developing a plan for equitable use of ACCESS data in the public domain for scientific research; providing the interface between the Science Definition Team (SDT), to be appointed by NASA following the selections, and both the intra- and interdiscipline communities; and/or preparing, updating, and maintaining ACCESS reports, presentations, visual materials, and other public information, including data bases and websites.

Proposals may address any or all of these categories. NASA expects to select a balanced set of compatible studies having the potential to lead to a well-defined mission that could be ready for a new start within approximately two years, be completed within three years from new-start authorization, and be built within a cost cap of \$70 million (Real Year) for the construction and development phase (Phase C/D). All selected studies will be required to submit interim and final reports that will be made available in a publicly accessible data base.

The studies selected through this NRA will be carried out in parallel with both the above-mentioned ISS accommodation study and a related, complementary set of engineering studies (systems, mechanical, thermal, power, data, etc.) led by the Systems Technology and Advanced Concepts Directorate of the NASA Goddard Space Flight Center. Interim and final results from selections in response to this NRA will be fed into both of those studies. The SDT will assist in coordinating, planning, and phasing this three-pronged approach to the ACCESS mission definition. The CRRC is acting as the interim SDT.

It should be explicitly noted that there is no guarantee that any announcement of opportunity for an ACCESS mission will be issued in the future nor, if such a solicitation is issued, that any concept or detector technology study selected through this NRA will be included in a strawman payload or be selected even if it is so included.

2. Mission Constraints

The Advanced Technology and Mission Studies Division in the Office of Space Science at NASA Headquarters is responsible for managing the ISS accommodation study selected in response to NRA 96-OSS-03.

The proposal for that concept suggested that ACCESS would occupy the same attachment point previously occupied by the Alpha Magnetic Spectrometer (AMS), be launched to the ISS on the same Shuttle flight that retrieves the AMS, and, like AMS, be designed for three years on orbit. It also assumed that ACCESS will utilize the robotics emplacement approach that has been adopted for AMS. Specifically, it is planned that the ACCESS instrument may be carried to orbit on a carrier such as a Unique Support Structure (USS), which will be removed from the Shuttle by the Remote Manipulator System (RMS) and handed off to the ISS RMS. The latter will, in turn, attach the instrument to the attachment point used earlier by AMS.

The ACCESS resource requirements must not exceed the constraints of either the Shuttle or the ISS attachment point. Guidance on those constraints is available from Mr. Mark Sistilli, the Attached Payloads Integration Manager for Space and Earth Sciences at NASA Headquarters (**E-mail: mark.sistilli@hq.nasa.gov; 202-358-2242**). General Information is also available from the International Space Station home page on the Internet at URL address

<<http://issa-www.jsc.nasa.gov>>

Since the focus of ACCESS is measurement of the rare cosmic rays with very high energy or with very high charge, it is expected to require a relatively large, massive instrument, albeit one whose size will be restricted by volume and mass constraints of either or both the Shuttle and the ISS. At this time, it seems that the limiting resource in the 2004 to 2005 timeframe may be the mass-to-orbit allocation for attached payloads. Therefore, innovative designs and flexible architecture of detectors and subsystems that could be adapted to on-orbit robotics assembly, if needed, are encouraged.

**INSTRUCTIONS FOR RESPONDING TO
NASA RESEARCH ANNOUNCEMENTS**

Part 1852.235-72

NASA Federal Acquisition Regulations (FAR) Supplement (NFS)
Version 89.90, Effective March 11, 1997.

Accessible at URL

<<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>>,
open Part 1852.228 to 1852.241 from menu.

(JANUARY 1997)

A. General.

(1) Proposals received in response to a NASA Research Announcement (NRA) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

(2) A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

(3) NRA's contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRA's.

(4) A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument. Contracts resulting from NRA's are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement (NFS). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

(5) NASA does not have mandatory forms or formats for responses to NRA's; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

(6) To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

B. NRA-Specific Items. Several proposal submission items appear in the NRA itself: the unique NRA identifier, when to submit proposals, where to send proposals, number of copies required, and sources for more information. Items included in these instructions may be supplemented by the NRA.

C. Proposal Content. The following information is needed to permit consideration in an objective manner. NRA's will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

(1) *Transmittal Letter or Prefatory Material*.

- (i) The legal name and address of the organization and specific division or campus identification, if part of a larger organization;
- (ii) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;
- (iii) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;
- (iv) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;
- (v) Identification of other organizations that are currently evaluating a proposal for the same efforts;
- (vi) Identification of the NRA, by number and title, to which the proposal is responding;
- (vii) Dollar amount requested, desired starting date, and duration of project;
- (viii) Date of submission; and
- (ix) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself).

(2) *Restriction on Use and Disclosure of Proposal Information*. Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following Notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the Notice. In any event, information contained in proposals 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.

<p><u>Notice</u></p> <p>Restriction on Use and Disclosure of Proposal Information</p>
<p>The information (data) contained in [insert page numbers or other identification] of this proposal 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 other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.</p>

(3) *Abstract.* Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

(4) *Project Description.*

(i) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance, relation to the present state of knowledge, and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(ii) When it is expected that the effort will require more than one year, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

(5) *Management Approach.* For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described.

(6) *Personnel.* The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications, and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

(7) *Facilities and Equipment.*

(i) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use. Include evidence of its availability and the cognizant Government points of contact.

(ii) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non research purposes should be explained.

(8) *Proposed Costs.*

(i) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages, fringe benefits, equipment, expendable materials and supplies, services,

domestic and foreign travel, ADP expenses, publication or page charges, consultants, subcontracts, other miscellaneous identifiable direct costs, and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel). Estimate all staffing data in terms of staff-months or fractions of full-time.

(ii) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired, purpose and estimated number and lengths of trips planned, basis for indirect cost computation (including date of most recent negotiation and cognizant agency), and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases.

(iii) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

(9) *Security.* Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

(10) *Current Support.* For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

(11) *Special Matters.*

(i) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(ii) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

D. Renewal Proposals

(1) Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

(2) NASA may renew an effort either through amendment of an existing contract or by a new award.

E. Length. Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments.

F. Joint Proposals.

(1) Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

(2) Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

G. Late Proposals. A proposal or modification received after the date or dates specified in an NRA may be considered if doing so is in the best interests of the Government.

H. Withdrawal. Proposals may be withdrawn by the proposer at any time before award. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

I. Evaluation Factors

(1) Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

(2) Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

(3) Evaluation of its intrinsic merit includes the consideration of the following factors of equal importance:

(i) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(ii) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(iii) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(iv) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

(4) Evaluation of the cost of a proposed effort may include the realism and reasonableness of the proposed cost and available funds.

J. Evaluation Techniques. Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases, proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels.

The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

K. Selection for Award.

(1) When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

(2) When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

L. Cancellation of NRA. NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for anyone's failure to receive actual notice of cancellation.

(End of provision)

Additional Guidelines For The Preparation Of Proposals In Response To This NASA Research Announcement

The information contained in Appendix C augments and supersedes Appendix B and is applicable only to this NRA.

1. Notice of Intent

Advance information in Notices of Intent (NOI) assists NASA in preparing for the peer review of proposals. A one-page NOI to propose to this NRA should list:

- a. The PI's name and institution;
- b. The PI's E-mail and postal addresses and telephone number;
- c. Co-I(s) and their institution(s), to the extent known by the NOI due date;
- d. Descriptive working title of activity to be proposed; and
- e. A brief description of the proposed activity.

Notices of Intent, to be useful, must arrive at the address given in the covering letter of this solicitation of this NRA by the specified date.

2. General Proposal Guidelines

All sections of a proposal submitted in response to this NRA are expected to adhere to the following requirements:

- a. Printed on plain, white, 8.5 x 11 inch paper (or standard A4 for non-U.S. proposals), bound with staples (i.e., no cardboard stock, plastic covers, or permanent binders), and without colored illustrations or photographs unless absolutely critical to the display of critically important proposal data;
- b. Single or double-spaced, 12-point or larger type font (i.e., <15 characters per inch), with at least 1 inch margins all around, and using double-sided printing, if possible;
- c. Proposals are limited to not more than 15 pages, including references and figures, for the Scientific and Technical Plan (see item d. in Section 3 below), where each side of a sheet of paper containing text is considered a page. The rest of the proposal should be as concise as completeness will allow.
- d. All text in English (including non-U.S. proposals) and no material on electronic media (e.g., audio and/or video tapes and computer diskettes) nor by direction to sites on the Internet.

3. Proposal Content and Organization

Each proposal requesting funding should include the following parts in the order listed:

- a. Cover Page (form provided in Appendix D of this NRA). Note that the cover page requires signatures of the PI and the Institutional Authorizing Official.

- b. Abstract of the proposed scientific investigation (form provided in Appendix D of this NRA). NASA plans to publish the proposal titles, names of Principal Investigators with institutions, and summaries of all selected investigations in a publicly accessible data base. Therefore, the submitted Abstract should be very clearly written in the specified form and should not contain any proprietary information that would preclude its release without restriction.
- c. Table of Contents.
- d. Scientific and Technical Plan. This section should provide a detailed description of the proposed investigation/activity. It should provide sufficient detail to enable a reviewer to judge its merit and feasibility in relation to the objectives and scope of the ACCESS study described in Appendix A.
- e. Management Plan. Describe the role of the PI and each Co-I, and any other significant personnel, in the accomplishment of the proposed work. If multiple institutions are involved, the institutional responsibilities and/or other terms of agreement necessary for achieving the objectives of the program should be specified.
- f. Budget Plan. The budget plan must contain the Summary and Yearly Budgets on forms supplied in Appendix D of this NRA, plus additional pages providing all the budget details and justifications requested in the "Instructions for Budget Summary" in Appendix D. The Budget Plan should clearly demonstrate to reviewers and to NASA the reasonableness of each cost item and its relevance to the purposes of the proposal and to the goals of the ACCESS study described in Appendix A.
- g. Current and Pending Federal Research Support (Format provided in Appendix D of this NRA).
- h. Curriculum Vitae A brief curriculum vita, along with a list of relevant publications covering the past five years, should be included. The curriculum vita and publications list should not exceed one page per PI or Co-I.
- i. Certification Forms (note: the Certification forms need only be included in the signed original proposal; see Appendix D)
- j. Institutional budget forms (preference of submitting institution(s)).

4. Guidelines for Foreign Participation

NASA welcomes proposals from outside the U.S. However, investigators working outside the U.S. are not eligible for funding from NASA. Proposals from non-U.S. entities should not include a cost plan. Proposals from outside the U.S. and U.S. proposals that include non-U.S. participation must be endorsed by the respective Government agency or funding/sponsoring institution in that country from which the non-U.S. participant is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

In addition to sending the requested number of copies of the proposal to the designated address, one copy of the proposal, along with the Letter of Endorsement from the sponsoring non-U.S. agency must be forwarded to:

Bettye Jones
(NRA 97-OSS-13)
International Science and Aeronautics Division
Code IS
NASA Headquarters
Washington, DC 20546-0001
USA

All proposals must be written in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date; those received after the closing date will be treated in accordance with NASA's provisions for late proposals. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address if endorsement is not possible before the announced closing date. In such cases, however, NASA's International Science and Aeronautics Division should be advised when a decision on endorsement can be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Research Program Management Division. Copies of these letters will be sent to the sponsoring Government agency. Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's International Science and Aeronautics Division will arrange with the non-U.S. sponsoring agency for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging their respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

1. A letter of notification by NASA, and
2. An exchange of letters between NASA and the sponsoring governmental agency; or
3. A formal Agency-to-Agency Memorandum of Understanding (MOU).

5. Education and Public Outreach

"Partners in Education: A Strategy for Integrating Education and Public Outreach Into NASA's Space Science Programs" (March 1995) describes the Office of Space Science's approach for making education at all levels and the enhancement of the public understanding of science integral parts of space science research activities. Education and public outreach are now expected to be a part of each flight program and research discipline. The follow-on implementation plan, "Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy," produced by the Education/Public Outreach Task Force of the Space Science Advisory Committee (SScAC), was published October 15, 1996. The implementation plan may be obtained from the OSS home page at URL address <http://www.hq.nasa.gov/office/oss/pubs.htm> or from Dr. Jeffrey D. Rosendhal, Office of Space Science, Code S, NASA Headquarters, Washington, DC 20546-0001.

In accordance with the policies in the OSS education strategy and the recommendations in the implementation plan, proposers are encouraged to include education and public outreach activities in their proposals. Up to ten percent of a total grant award may be used for such activities. Such budgets should be included in Line 4 of the Budget Summary form in Appendix D.

We also call your attention to the Initiative to Develop Education through Astronomy (IDEA) program. This program, currently administered by the Space Telescope Science Institute, specifically provides small grants (typically \$6,000, but ranging up to \$20,000) to enhance the participation of space scientists in precollege or public outreach activities. A call for proposals to the IDEA program is issued annually by the Space Telescope Science Institute. For more information on the IDEA program, contact Dr. Anne Kinney, Project Scientist for Education, Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, MD 21218.

Proposals will not be selected solely or primarily on the strength of their education/outreach components, but the quality of a proposed education/outreach effort will be used as an additional factor in selecting among otherwise equal proposals. Evaluation criteria for education components, whose description should not exceed 4 to 5 pages, will include:

- The educational effectiveness and realism of program concept,
- Existence of effective partnerships with educational institutions and/or effective leveraging of existing resources and the prospects for the program to have a multiplier effect,
- Capability of proposers to carry out proposed program,
- Consistency with national educational reform efforts, and
- Consistency of budget with the OSS Education/Public Outreach Strategy.

6. Evaluation, Selection, Notification, and Award Implementation

The evaluation criteria shall be as given in Section I of Appendix B, with the explicit understanding that "NASA's objectives" referred to in Appendix B are the objectives of this NRA stated in Appendix A. Proposals will be evaluated for intrinsic merit by peer scientists by mail and/or at a panel meeting. The Program Scientist will use the consensus of these reviews, plus considerations of cost and program objectives, to recommend selections for awards. Selections for awards will be made by the Director of the Research Program Management Division. Following selections, all proposers will be notified by mail of the decision on their proposal and who to contact for further information or to arrange a debriefing. NASA may desire to select only a portion of a proposer's investigation, in which case the proposer will be given the opportunity to accept or decline such partial support.

When a proposal is selected for award, negotiation and award will be handled by the Grants and Contracts office at the NASA Goddard Space Flight Center. The proposal is used as the basis for negotiation. The Contracting Officer may request certain business data and may forward a model contract and other information which will be of use during the contract negotiation. Grants and contracts, in conformance with NASA Grant and Cooperative

PROPOSAL FORMS KIT

This Proposal Forms Kit contains the standard forms for the following items, all of which are required for the submission of a complete proposal in response to an Office of Space Science NASA Research Announcement (NRA), unless specifically excepted or revised in the NRA itself. {Common exceptions are that some NRA's may provide a Cover Page that includes space for an abbreviated Abstract (that also may include instructions for electronic submission) and/or that allows for a deferred submission of budget materials.}

- **CHECKLIST FOR PROPOSAL PREPARATION**
- **PROPOSAL COVER PAGE** - Note that two signatures are required, one of the proposing Principal Investigator and one of an official from the PI's institution who is authorized to commit the institution to the proposed work if the proposal is selected. The original of this page, with original signatures, must be affixed to the front of the original copy of the proposal, which should not be bound to allow ease of disassembly for reproduction by NASA.
- **PROPOSAL ABSTRACT** - A complete Abstract should include a statement of the central objectives of the proposed research, an outline of methods to be used in pursuing that research, the significance of the proposed work to NASA OSS interests, and a list of key, relevant published or in-press articles.
- **BUDGET SUMMARY** - Carefully note and follow the Instructions that start at the bottom of the page and continue on the next page. Failure to do so may seriously delay the awarding of the grant or contract by NASA should the proposal be recommended for selection. In addition to this form, the submitting organization may include its own budget forms in its own format and without regard to any page limit.
- **CURRENT AND PENDING SUPPORT** - Provide requested material for the Principal Investigator (and any key Co-Investigators).
- **CERTIFICATION FOR DRUG-FREE WORKPLACE** - Required with an institutional signature for all proposals except those from U.S. Federal institutions.
- **CERTIFICATION FOR DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITIES** - Required with an institutional signature for all proposals except those from U.S. Federal institutions.
- **CERTIFICATION REGARDING LOBBYING** - Required with an institutional signature for all proposals requesting cumulative funding in excess of \$100,000, except those from U.S. Federal institutions.
- **MAILING FORM UPDATE**

CHECKLIST FOR PROPOSAL PREPARATION

SUBMISSION OF NEW PROPOSAL

<input type="checkbox"/>	COVER PAGE (original signatures with original of proposal)
<input type="checkbox"/>	PI SIGNATURE
<input type="checkbox"/>	INSTITUTION AUTHORIZING SIGNATURE
<input type="checkbox"/>	PROPOSAL ABSTRACT (not to exceed one page per form)
<input type="checkbox"/>	TABLE OF CONTENTS (optional)
<input type="checkbox"/>	SCIENTIFIC/TECHNICAL DESCRIPTION (< specified page limit)
<input type="checkbox"/>	CURRICULUM VITAE (2 pp. for PI; 1 p. for each Co-I)
<input type="checkbox"/>	BUDGET SUMMARY AND DETAILS (per form)
<input type="checkbox"/>	BUDGET FOR EACH YEAR (per form)
<input type="checkbox"/>	FACILITIES AND EQUIPMENT (as appropriate)
<input type="checkbox"/>	CURRENT AND PENDING SUPPORT (for PI)
<input type="checkbox"/>	CERTIFICATION FORMS - only one signed copy of each with original proposal; U.S. Government institutions do not submit.
<input type="checkbox"/>	DRUG-FREE WORKPLACE
<input type="checkbox"/>	DEBARMENT, SUSPENSION & OTHER RESPONSIBILITIES
<input type="checkbox"/>	LOBBYING (if proposing for > \$100,000)
<input type="checkbox"/>	ORIGINAL AND COPIES TO NASA BY PROPOSAL DEADLINE

SUBMISSION FOR RENEWAL OF A MULTIPLE YEAR AWARD

<input type="checkbox"/>	COVER LETTER
<input type="checkbox"/>	PI ORIGINAL SIGNATURE
<input type="checkbox"/>	PROGRESS REPORT
<input type="checkbox"/>	BUDGET (if there are changes)
<input type="checkbox"/>	CERTIFICATION FORMS (only one signed copy of each)
<input type="checkbox"/>	DRUG FREE WORKPLACE
<input type="checkbox"/>	DEBARMENT, SUSPENSION & OTHER RESPONSIBILITIES
<input type="checkbox"/>	LOBBYING (if proposing cumulative funding of > \$100,000)
<input type="checkbox"/>	ORIGINAL AND COPIES TO TECHNICAL MONITOR

OSS PROPOSAL COVER PAGE

NRA #	NRA Title

Principal Investigator			
<i>Title</i>	<i>First Name</i>	<i>Middle Name</i>	<i>Last Name</i>
Department			
Company/Institution			
Street Address		City/Town	
State	Zip/Postal	Country	
Telephone	Fax	E-Mail Address	
Principal Investigator's Signature			Date

Proposal Title

Co-Investigator(s) Name	Institution	E-mail

Institutional Endorsement

Name of Authorizing Official	
Title	
Institution	
Signature	Date

Budget Summary

	Year 1	Year 2	Year 3	Total Funding
Amount Requested				

PROPOSAL ABSTRACT

Principal Investigator			
<i>Title</i>	<i>First Name</i>	<i>Middle Name</i>	<i>Last Name</i>
Proposal Title			

PROPOSAL BUDGET SUMMARY

FROM: _____ **TO** _____

Title Of Investigation:

Principal Investigator / Institution:

	A	<u>(NASA USE ONLY)</u>	
		B	C
1. Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____
2. Other Direct Cost:			
a. Subcontracts/grants	_____	_____	_____
b. Consultants	_____	_____	_____
c. Equipment	_____	_____	_____
d. Supplies	_____	_____	_____
e. Travel	_____	_____	_____
f. Other	_____	_____	_____
3. Indirect Costs	_____	_____	_____
4. Other Applicable Costs	_____	_____	_____
5. Subtotal--Estimated Costs	_____	_____	_____
6. Less Proposed Cost Sharing	_____	_____	_____
7. Carryover Funds (if any)			
a. Anticipated amount	_____	_____	_____
b. Amount used to reduce budget	_____	_____	_____
8. Total Estimated Costs	_____	_____	XXXXXXXX
APPROVED BUDGET	XXXXXXXX	XXXXXXXX	_____

INSTRUCTIONS

1. Provide a complete budget summary sheet for year one and separate estimates **for each subsequent year.**
2. Recipient's estimated costs should be entered in Column A. Columns B and C are for NASA use only. Column C represents the approved grant budget.
3. Provide as attachments detailed computations of estimates in each cost category with narratives required to fully explain proposed costs. See definition of terms and details under "SPECIFIC COSTS" on next page.

SPECIFIC COSTS

1. Direct Labor (salaries, wages, and fringe benefits): Attachments should list number and titles of personnel, amounts of time to be devoted to the grant, and rates of pay.
2. Other Direct Costs:
 - a. Subcontracts: Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.
 - b. Consultants: Identify consultants to be used, why they are necessary, the time they will spend on the project, and rates of pay (not to exceed the equivalent of the daily rate for Level IV of the Executive Schedule, exclusive of expenses and indirect costs).
 - c. Equipment: List separately. Explain the need for items costing more than \$5,000. Describe basis for estimated cost. General purpose equipment is not allowable as a direct cost unless specifically approved by the grant officer.
 - d. Supplies: Provide general categories of needed supplies, the method of acquisition, and the estimated cost.
 - e. Travel: List proposed trips individually and describe their purpose in relation to the grant. Also provide dates, destination, and number of travelers where known.
 - f. Other: Enter the total of direct costs not covered by 2a through 2e. Attach an itemized list explaining the need for each item and the basis for the estimate.
3. Indirect Costs: Identify indirect cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. Provide the name, address, and telephone number of the Federal agency official having cognizance. If unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.
4. Other Applicable Costs: Enter total of other applicable costs with an itemized list explaining the need for each item and basis for the estimate.
5. Subtotal-Estimated Costs: Enter the sum of items 1 through 4.
6. Less Proposed Cost Sharing (if any): Enter any amount proposed. If cost sharing is based on specific cost items, identify each item and amount in an attachment.
7. Carryover Funds (if any): Enter the dollar amount of any funds that are expected to be available for carryover from the prior budget period. Identify how the funds will be used if they are not used to reduce the budget. NASA officials will decide whether to use all or part of the anticipated carryover to reduce the budget. Not applicable to 2nd-year and subsequent-year budgets submitted for the award of a multiple year grant.
8. Total Estimated Costs: Enter the total after subtracting items 6 and 7b from item 5.

CURRENT AND PENDING RESEARCH SUPPORT

Provide the following information for all current research support from all sources being conducted or currently proposed by the Principal Investigator:

- Name of Principal Investigator

A. Current Support

1. Project Title
2. Sponsoring agency or institution (including point of contact)
3. Period and amount of award
4. Commitment by PI in terms of Full Time Equivalent (FTE) Work Year

B. Pending Support (including renewal of multiple year awards)

1. Project Title
2. Sponsoring agency or institution (including point of contact)
3. Period and amount of award
4. Commitment by PI in terms of Full Time Equivalent (FTE) Work Year

C. Other institutions, including point of contact with telephone number, to which this proposal, or parts thereof, has been contemporaneously submitted for consideration of funding.

**Certification Regarding Drug-Free Workplace Requirements
Grantees Other Than Individuals**

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or government wide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

This grantee certifies that it will provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing a drug-free awareness program to inform employees about -
 - The dangers of drug abuse in the workplace;
 - The grantee's policy of maintaining a drug-free workplace;
 - Any available drug counseling, rehabilitation, and employee assistance programs, and
 - The penalties that may be imposed upon employees for drug abuse violations in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will -
 - Abide by the terms of the statement; and
 - Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;
- (e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;
- (f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted -
 - Taking appropriate personnel action against such an employee, up to and including termination; or
 - Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph (a), (b), (c), (e), and (f).

Organization Name

PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature

Date

**Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions**

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 statutes 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.

Organization Name

PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature

Date

Certification Regarding Lobbying

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (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.

Organization Name

PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature

Date