

**National Aeronautics and
Space Administration**

February 20, 2002

NRA-02-OES-01

RESEARCH ANNOUNCEMENT

ADVANCED COMPONENT TECHNOLOGY PROGRAM

Proposals due April 5, 2002

ADVANCED COMPONENT TECHNOLOGY PROGRAM

**NASA Research Announcement
Soliciting Research Proposals
For
Period Ending
April 05, 2002**

**NRA 02-OES-01
Issued February 20, 2002**

**Office of Earth Science
National Aeronautics and Space Administration
Washington, DC 20546**

EARTH SCIENCE ENTERPRISE ADVANCED COMPONENT TECHNOLOGY (ACT) PROGRAM

The National Aeronautics and Space Administration (NASA) announces the solicitation of proposals for the Advanced Component Technology (ACT) Program, a technology development program in support of the Earth Science Enterprise (ESE). The ACT program, formally known as the Advanced Technology Initiatives Program (ATIP), seeks proposals for technology development activities leading to new components and subsystems that will enable new ESE science measurements and visionary concepts.

I. Introduction

a) Earth Science Enterprise

The mission of NASA's Earth Science Enterprise (ESE) is to develop a scientific understanding of the Earth system and its response to natural or human-induced changes to enable improved prediction of climate, weather, and natural hazards. The Earth science research program aims to acquire a deeper understanding of the components of the Earth system and their interactions. These interactions occur on a continuum of spatial and temporal scales ranging from short-term weather to long-term climate scales, and from local and regional to global scales. Advanced technology will play a major role in shaping the ESE fundamental and applied programs of the future.

The ESE technology program seeks to develop and adopt advanced technologies to enable mission success and serve national priorities. Technological innovation in reducing size, mass and/or power requirements in the development of future remote sensing instruments are essential to the future success of the ESE. A major part of the Enterprise's strategy is the reduction of risk in the rapid development of small highly efficient, less costly instruments through a robust technology development and validation program.

b) Advanced Component Technology (ACT) Program

The objectives of the ACT program are to identify, develop and demonstrate component and subsystem technologies which:

- Reduce the risk, cost, size, and development time for Earth observing instruments, platforms and information systems and,
- Enable new Earth observation measurements.

The ACT program is designed to implement a broad array of technology developments for instruments, platforms, and information systems. Critical to this design is the relationship between the various technology development programs that the ESE has available to enable missions. Within this development environment, the ACT program is complementary to the Instrument Incubator Program (IIP), and the New Millennium Program (NMP) for instrument, and space flight validation, respectively. The overall

program is designed to bring components and subsystems to a demonstrated Technology Readiness Level (TRL) for infusion into a future science mission.

Technology Readiness Level is a systematic metric/measurement system that supports assessments of the maturity of a particular technology and the consistent comparison of maturity between different types of technology (see Appendix F for the TRL definitions). Figure 1, shows the range of Technology Readiness Levels for these programs and future science missions.

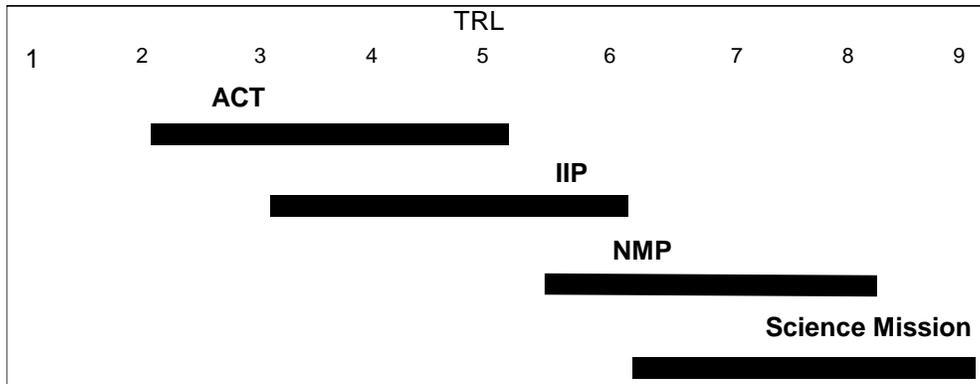


Figure 1: TRL Ranges for ESE Technology Development Programs

II. NASA Research Announcement:

a) Goals

This NASA Research Announcement (NRA) solicits component and subsystem technologies for Earth observing remote sensing instruments that enable surface, space-borne, and airborne measurements, that have the highest potential to meet the measurement capability requirements of the ESE thus the goals of the ACT program. The ACT program is envisioned to be flexible enough to accept technology developments at various stages of maturity, and through appropriate risk reduction activities (such as requirements analysis, conceptual design, laboratory breadboards and pre-engineering models), advance the TRL of the component or subsystem.

The three classes of instrument component and subsystem technologies solicited by this NRA are:

1. innovative components and subsystems that enable new measurement implementations and science investigations,
2. components and subsystems that improve current implementations in order to reduce life cycle cost and development risk, and
3. development of selected technologies that advance the state-of-the-technology in the selected domain and that have the potential to impact a broad set of future missions which are relevant to the ESE.

The ESE has adopted an integrated planning process with the goal of ensuring effective use of NASA resources for technology development. In this process, system capability drivers are derived directly from the ESE fundamental and applied research priorities as described in the next section. Priorities for technology development are then generated through system studies that compare the relative merits of different implementation options in terms of life cycle cost reduction and improved or enabled capability to perform priority science investigations. Figure 2, depicts a schematic of this process. The focus of this NRA falls within the element entitled Technology Developments.

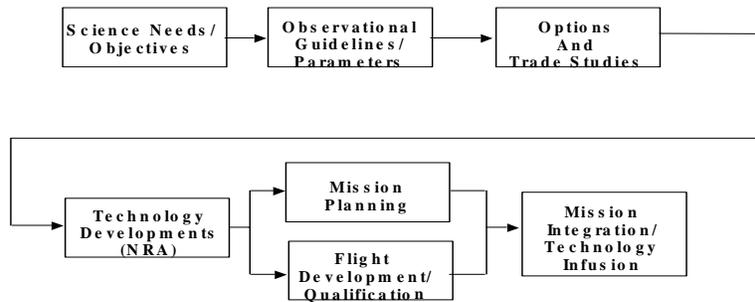


Figure 2: Integrated Planning Process for Technology Development

(b) Proposal Science Research Topics

The *NASA ESE Research Strategy for 2000-2010* describes the Enterprise goal of obtaining a scientific understanding of the entire Earth system on a global scale. This involves several challenges. The first challenge is the characterization of the present state of the Earth system and the forcings that affect the Earth system to serve as the baseline information for research. A second challenge is the quantitative description elucidating how the Earth system’s component parts and the interactions among them have evolved, how they function, and how they may be expected to continue to evolve on all time scales. The last challenge is to develop the capability to predict those changes that will occur in the future over seasonal, inter-annual, decadal, and even longer time scales, both naturally and in response to human activity.

The strategic objective of the Enterprise is to provide scientific answers to the overarching question:

How is the Earth changing and what are the consequences for life on Earth?

The key research topics studied by NASA’s ESE fall largely into three categories: forcings, responses, and the processes that link the two and provide feedback mechanisms. This conceptual approach applies to all research areas of NASA's Earth Science program, although it is particularly relevant to the problem of climate change.

The scientific strategy to address this complex problem can be laid out in five fundamental questions, each raising a wide range of cross-disciplinary science problems.

- *How is the global Earth system changing?*
- *What are the primary forcings of the Earth system?*
- *How does the Earth system respond to natural and human-induced changes?*
- *What are the consequences of change in the Earth system for human civilization?*
- *How well can we predict future changes in the Earth system?*

The science questions define a logical progression in the study of the Earth system, but each question covers a range of topics too broad to serve as a guide for program implementation. The questions define a pathway of “variability, forcing, response, consequence, and prediction” that is taken to further enumerate more specific questions that provide direction and focus to the program. Specific and prioritized science questions, for the purpose of this announcement, can be found in the *NASA ESE Research Strategy 2000-2010* located on the World Wide Web (WWW) by performing the following:

- Go to HYPERLINK <http://earth.nasa.gov/visions/>.
- Click on Research Strategy.
- Download ResearchStrat.doc (1.8MB).
- Go to page 31, Table 4.1: Hierarchy of Science Questions

Given the three-year timeline for awards resulting from this NRA, successful ACT proposals are anticipated to contribute to the ESE mid-to long-term science objectives and priorities (i.e., 2008 and beyond). Responsive proposals will address technology developments that enable science measurement techniques that allow us to answer these science questions relevant to this timeframe.

(c) Proposal Technology Research Topics

The Earth Science Technology Office (ESTO) developed a Capability Needs for Science, Applications and Technology (CN-SAT) document that captures the key technologies required to support the ESE science questions. The CN-SAT will serve as the top-level document that determines relevance to technologies required by ESE. The CN-SAT can be found on the WWW at <http://esto.gsfc.nasa.gov/>, by selecting “Capability Needs for Science, Applications and Technology (CN-SAT)”.

In addition to the CN-SAT, mid-to long-term science objectives/priorities can be obtained from the NASA ESE Technology Planning Workshop proceedings and the Earth Science Vision Initiative documentation. This information can be found on the WWW at <http://esto.gsfc.nasa.gov/>.

Highly innovative proposals that address the ESE science questions as they relate to the technology challenges in the CN-SAT, the ESE Technology Planning Workshop proceedings, and the Earth Science Vision Initiative and that meet the evaluation factors

of Appendix A will be considered. Proposals must indicate which science question(s) or visionary concept(s) lead to the focus of the proposed development.

Note: The only exception is that laser component and subsystem technologies will not be funded in this NRA. The ESE will solicit these technologies at a later date under a different solocitation .

For the purposes of this NRA, high priority candidate technologies supporting mid-to long-term ESE science objectives/priorities may include:

Antenna technologies:

- Ultra-lightweight, large structural components, such as deployable and/or inflatable booms, membranes, and apertures for radiometers and synthetic aperture radars
- Lightweight, micro-strip antenna technologies for microwave systems
- Steerable, microwave antenna technologies

Electronics:

- Low mass/low power stable RF electronics
- High speed, low power, digital correlators
- Millimeter and sub-millimeter receiver technologies
- Low power, high density, control electronics

Optics:

- Optical system transform spectrometers (minimal moving parts)
- Ultra-lightweight, deployable concepts for large aperture optical systems
- Compact, light weight, optical systems

Detectors

- Large format arrays (Visible-near infrared, Short-wave infrared, Far infrared, and UV)
- Cryo-cooler technologies (cooling to <10K with power <10 mW)
- Linear variable etalons

The list is neither comprehensive nor prioritized, and is only meant to indicate the general types of components and subsystems being solicited from this NRA.

(d) Technology Readiness Level (TRL) Guidance

The proposer must define the entry point TRL, the exit TRL, and success criteria for the proposal activity. Past and ongoing work on the component development should determine the entry point. For this NRA, entry TRL is approximately 2 with an exit TRL of approximately 5 (see Appendix F for a definition of TRL). Instrument technologies, after graduating from the ACT program, may be further developed through the Instrument Incubator Program (see Section e: Instrument Incubator Program). A responsive proposal will demonstrate advancement of at least one TRL within the

proposed performance period. These limitations naturally preclude space qualification or end-to-end instrument designs from being performed in the ACT program. However, an instrument concept must be defined for which the components or subsystems will be a part. The results at the exit point must provide convincing evidence that the components or subsystems can be integrated into an on-going technology development program, such as IIP, NMP, or directly into other flight validation programs for infusion into an instrument design.

Each proposed development must include an evaluation of feasibility, requirements analysis, construction of component or subsystem breadboards, and/or construction of component or subsystem pre-prototypes. All proposals should include evaluation of anticipated end-item performance, an estimate of the entry and exit TRLs, cost, number of years to achieve TRL, and documentation of technology dependencies. These items will be documented as contract deliverables.

Laboratory demonstrations may be funded and are expected to produce working components or subsystems and data documenting performance measured in the laboratory. The final report should document these measurements.

(e) Relationship to Other Programs

The ESE is responsible for planning technology development activities so that major technical risks are retired prior to the selection of its scientific missions. Other NASA technology programs that complement the ACT program and contribute to technology infusion are the Instrument Incubator Program (IIP) and the New Millennium Program (NMP).

Instrument Incubator Program

The objectives of the Instrument Incubator Program (IIP) are to identify, develop and (where appropriate) demonstrate new measurement technologies that reduce the risk, cost, size, and development time of Earth-observing instruments, and enable new Earth-observation measurements. The IIP is designed to bring instrument systems to a demonstrated technology readiness level consistent with successful science Announcement of Opportunity (AO) competition in today's fast track (3-4 year) development environment. The Instrument Incubator may depend on NMP for space flight validation, if necessary, of instruments developed in the IIP that were selected during an open solicitation and peer review process.

New Millennium Program

NASA created the New Millennium Program (NMP) to enable new missions by the identification, development, and flight validation of emerging technologies. In order to fulfill program goals, affordable missions with highly focused technological objectives are chosen to enhance scientific capability. The program encourages revolutionary and breakthrough technologies that traditionally have been difficult to incorporate into a

science mission because of the inherently high risk associated with their first use. Key areas include lower mass systems to reduce launch costs, large deployable structures, high rate communication, autonomous operations, and distributed spacecraft systems.

(f) Domestic Partnerships

This announcement encourages technology development partnerships among U.S. Government Agencies, Private Industry, and Academic Institutions. These leveraging opportunities enable cost sharing and should be mutually beneficial to each partner and the nation. A joint proposal is required for a domestic partnership. The joint proposal must satisfy the requirements of Appendix B, section (f).

(g) International Participation

This announcement is open to the international technology community. International cooperative proposals, with co-investigators from U.S. institutions participating in foreign-led proposals or with co-investigators from non-U.S. institutions on the teams of proposals from U.S. institutions, are also encouraged. These proposals should be on a "no-exchange-of-funds" basis for their non-U.S. elements and should identify any requirements for NASA financial support for U.S. participants. Proposals from non-U.S. institutions are encouraged, but only on a "no-exchange-of-funds" basis. Specific instructions for proposals from non-U.S. institutions are included in Appendix B.

(h) Funding

The U.S. 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 that are determined to be acceptable by the Government for award under this announcement. Funding of the selected proposals will be through the award of contracts. No additional funds above the initially specified contract value will be available. Interagency agreements may be issued, though grants will *not* be awarded for this NRA. Proposers also are encouraged to offer cost sharing. Cost-sharing proposals must include a discussion on the data-rights requested by the offerer.

The budget, for this NRA, will be about \$12 million over three years. The Government expects to make approximately 10-15 awards under this NRA.

(i) Period of Performance

The minimum period of performance is 12 months. The total proposed period of performance must not exceed 36 months. The Government will award contracts for a 1-year base period, with up to two 1-year options excisable by the Government. NASA intends to use electronic transactions in implementing the selected proposals to reduce time and enhance efficiency consistent with the President's Management Agenda. Proposals must define clear, measurable milestones to be achieved in order to warrant exercise of any options.

(j) Rights to Data

In the event that a cost sharing arrangement is proposed, appropriate data rights that recognize the offerer's contributions as well as the Government's rights to access will be negotiated prior to awarding a contract.

(k) Reference Material

This announcement and appendices are available on the Research Opportunities home page on the WWW, at <http://research.hq.nasa.gov/> (look under "Office of Earth Science (Code Y)").

The new *NASA ESE Strategic Plan* and the *NASA ESE Research Strategy 2000-2010* are available on the WWW at <http://earth.nasa.gov/visions/> (look under "Strategies and Policies")

The Earth Science Technology Office (ESTO) hosts a WWW page, <http://esto.gsfc.nasa.gov/>, which can be a source of information on the various elements of the Earth Science Technology Program.

The Capability Needs for Science, Applications and Technology '00 (CN-SAT) is available at: <http://esto.gsfc.nasa.gov/>

(l) Guidance to proposers; Procedures

Participation in this NRA or a subsequent similar NRA is *not* a prerequisite to selection as a science investigation as part of any future ESE NRA or AO. Similarly, participation in this NRA does not guarantee continued participation in the ACT program or success in any future ESE NRA or AO competitions. Successful participation in this NRA is intended to give innovative component and subsystems the technical pedigree they need to compete in relevant ESE solicitations against any good ideas elsewhere. Solicitations similar to this announcement will be issued periodically to select additional components and subsystems for development and to continue the promotion of promising technological developments.

(m) Required Proposal Forms

A proposal cover page is required as part of the proposal, but will not be counted against the page limit as defined in Appendix A. On the proposal cover page, the proposer is required to select the applicable development and science categories to which the proposal responds – reference Paragraphs II (b) and (c) of this NRA. This is intended to aid in the evaluation of the proposal, and will not be used to limit the applicability of proposals from related categories.

The proposal cover page must be submitted electronically to the SYS-EYFUS web site located at <http://proposals.hq.nasa.gov/>. For instructions on preparing and submitting the proposal cover pages, see Appendix C "Required Proposal Cover Pages".

As a minimum, the following information is required (see Appendix D for a reference):

- NRA number, alpha-numeric identifier, (Note: this will be included on the Web site template);
- The Principal Investigator's name, mailing address, phone number, and email address;
- The name(s) of any Co-Investigator(s) and institution(s);
- A descriptive title of the intended investigation;
- A brief (200-300 word) description of the proposal;
- Annual budget in Full cost accounting (FCA). To assist in the selection process, proposals submitted by a U.S. Government agency should include budgets that clearly indicate the costs with and without FCA; and,
- Selection of the relevant Technology and Science areas

Note that any Co-Investigators must obtain a User ID and password in order to be added to the Cover Page. Since the information submitted to the SYS-EYFUS Web site is validated before being officially added to the database, new users should allow two weeks for this validation to occur.

The hard copy version of the Cover Page must be printed in time to acquire signatures and be included with the original hard copy of the proposal for delivery according to this NRA schedule. Proposers are advised that they must not reformat the Cover Page after it is printed, as important NASA-required documentation may be lost. **Please note that submission of the electronic cover page, alone, does not satisfy the deadline for proposal submission.**

Proposals should be prepared and submitted in accordance with specific information provided in Appendices A-G of this Announcement. Appendix A provides additional instructions for proposers to this announcement. Appendix B contains the general instructions needed for preparation of solicited proposals in response to NASA Research Announcements. Appendix C contains the information needed to complete the required proposal cover pages. Appendix D provides the list of required declarations and the proposal cover sheet. Appendix E contains the required budget summary format. Appendix F contains the definition of Technology Readiness Levels. Appendix G contains a list of acronyms used. All proposals submitted to NASA in response to this announcement must have a completed cover sheet and information on current and pending research support from all other sources (see Appendix D) attached. All proposals from investigators from the U.S. and other countries will be reviewed and evaluated by NASA.

Submit proposals to: ESE ACT NRA—NRA-02-OES-01
NASA Peer Review Services, Code Y
500 E Street, SW, Suite 200
Washington, DC 20024-2760
(For overnight delivery purposes the
telephone number is 202-479-9030)

Proposals submitted to NASA Headquarters will cause a delay in receipt of your proposal, therefore, please adhere to “submit proposals to” noted above.

Selecting Official: Director of Program Planning and Development Division,
Office of Earth Science
NASA Headquarters

Point of Contact for Program Planning and Solicitation:
Janice Buckner
Office of Earth Science/ Code YF
NASA Headquarters
Washington, DC 20546-0001
Tel: (202) 358-0886
Fax: (202) 358-2769
jbuckner@mail.hq.nasa.gov

Point of Contact for Implementation:
Felicia Selden, Component Technology Program Manager
Earth Science Technology Office
NASA Goddard Space Flight Center, Code 711
Greenbelt, MD 20771
Tel.: (301) 286-4959
Fax: (301) 286-2756
fselden@pop700.gsfc.nasa.gov

Number of Copies: 20 hard copies and one magnetic or optical disk
(Macintosh or IBM PC compatible format)

Acceptable Formats: Microsoft Word, WordPerfect, Portable Document Format
(PDF) and Microsoft Excel for cost information.

Length of Proposal: 10 non-reduced, single space typewritten pages (see
Appendix A-section III)

(m) Selection Schedule

All proposals submitted in response to this announcement are due in accordance with the dates shown in this announcement. A summary of the solicitation schedule, including dates for the bidder's conference, can be found at the ESTO web site, <http://esto.gsfc.nasa.gov>.

Your interest in participating in this opportunity is heartily welcomed.

ORIGINAL SIGNED BY

Ghassem R. Asrar
Associate Administrator for Earth Science

Enclosures:

- Appendix A. Specific Guidelines for Proposers
- Appendix B. Instructions for Responding to NASA Research Announcements
- Appendix C. Instructions for the Required Proposal Cover Pages
- Appendix D. Proposal Cover Page, and Required Certifications, Disclosures, and Assurances
- Appendix E. Budget Summary
- Appendix F. Definition of Technology Readiness Levels
- Appendix G. Acronyms List

APPENDIX A

SPECIFIC GUIDELINES FOR PROPOSERS

I. Evaluation Factors

The following evaluation factors will be used to evaluate the proposals. They replace and supersede those contained in Appendix B, paragraph (i) Evaluation Factors.

Factor 1: Applicability to ESE and other national science measurements and technology needs (40% of total evaluation weight)

1. The proposal's relevance and potential contribution to NASA's Earth Science Enterprise.
2. The potential for the measurement system to reduce the risk, cost, size, and development time of ESE systems, or to enable a new measurement that cannot now be made. Potential cost reductions should be clearly stated and substantiated to the extent possible, with supporting analysis that indicates scalability.
3. The potential of the measurement system to be integrated, once matured, into an operational agency or the potential for the measurement system to have a national benefit beyond the ESE.
4. The potential for the measurement system to have commercial benefits.

Factor 2: Technical Merit (25% of total evaluation weight)

1. Feasibility of obtaining the required measurement or reduction in risk, cost, size, and development time with the proposed component or subsystem.
2. Degree of innovation of the proposed study or technology development concepts and approach and substantiated justification that the component or subsystem is at the appropriate level of readiness for the ACT program.

Factor 3: Management (15% of total evaluation weight)

1. Adequacy and realism of proposed milestones.
2. Adherence to sound and consistent management practices appropriate to the TRL level of the proposed task.
3. Qualifications of key personnel, and adequacy of facilities, staff, and equipment to support the proposed activity.
4. Commitment of the organization's management to the proposed technology development (evidenced by cost and resource sharing, prior teaming

arrangements, etc.). Proposers should identify any previous investment by the organization/program and provide supporting documentation.

Factor 4: Cost (10% of total evaluation weight)

1. Realism and reasonableness of the proposed cost.

Costs, in relation to all other factors combined, is significantly less important.

Factor 5: Past Performance (10% of total evaluation weight)

1. Past performance and related experience in the proposed area of technology development.

II. Proposal Development Guidance

The technical proposal must address each of the items below, which supplement or replace the guidance provided in Appendix B, Paragraph (c)(4).

- A. Applicability to ESE Measurements – Describe the benefit to future ESE science measurements (as defined in this NRA in Section II, Paragraph (b) Proposal Research Topics) that could utilize the proposed measurement system
- B. Description of Proposed Technology - Provide a description of the proposed measurement system technology. Describe the technical approach and include an operational concept or use scenario of the proposed measurement system technology that addresses ESE needs.
- C. Comparative Technology Assessment – Describe the anticipated advantages of this measurement system technology compared to those currently in use - e.g., reduction of size, mass, power, volume or cost, improved performance, or enabling of a new capability not previously possible. Review the current state of the art and relate to the proposed work.
- D. TRL Assessment – Provide the current TRL assessment of the measurement system technology, and the anticipated progression of TRL levels throughout the proposed effort. See Appendix F for guidance on Technology Readiness Levels.
- E. Research Management Plan – Provide a statement-of-work that concisely describes each task or milestone to be accomplished in the course of the research and development. Also, include a milestone chart that identifies critical dates in the research and development program. At least two milestones per 12-month period should be defined; the first midway and the second near the end of the period. Identify the roles of key personnel.

F. **Budget** – Full cost accounting (FCA) is required in all proposals, including those submitted by U.S. Government agencies. To assist in the selection process, Government proposals should be submitted with budgets that clearly indicate the costs with and without FCA. Budget data entered on the Proposal Cover sheet must be in FCA; Government proposals should clearly indicate non-FCA budgets in the text of the proposal. Cost sharing or matching arrangements should also be indicated, if applicable. Appendix E describes the requested budget summary format. In addition, a monthly cost plan should be submitted to facilitate contract negotiation.

Appendix B, Paragraph (c)(4i) is revised as follows:

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.

III. Proposal Submission Guidance

Appendix B, Paragraph (c)(8i) is revised as follows:

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. Major subcontractor costs should be itemized in a similar manner.

Appendix B, Paragraph (e) is revised as follows:

The maximum length of each proposal is limited to 10 non-reduced, single-space typewritten pages for the total of the project description, management approach, personnel, and facilities and equipment sections. The proposal cover sheet, the certifications required by Appendix D, and cost information are not included in the 10 page limit. Each side of a sheet of paper containing text or figures is considered a page. Use type font 12 point or larger, minimum one-inch margins and standard 8.5 x 11 inch paper. Proposals exceeding the page limit of 10 pages will be truncated to 10 pages prior to evaluation or returned to the proposer unevaluated.

The proposer shall submit 20 paper copies and one magnetic or optical disk (Macintosh or IBM PC compatible format) with the proposal in acceptable format. Acceptable electronic format consists of documents formatted using Microsoft Word, WordPerfect, or Portable Document Format (PDF). Include information on the formats chosen. Cost information shall be submitted in Microsoft Excel format. In order to expedite the review process, please submit the electronic proposal as two documents. That is, on the disk submitted with your proposal, separate the technical proposal (including proposal cover sheet and cost) from the certifications and representations required by Appendix D.

Appendix B, Paragraph (f1) is revised as follows:

Where multiple organizations are involved, the proposal must 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.

Appendix B, Paragraph (c)(8ii) is revised as follows:

Explanatory notes should accompany the cost proposal to provide clarification of items in the cost proposal that are not self-evident.

IV. General

Appendix B, Paragraph (a)(4) is revised as follows:

Contracts resulting from NRAs are subject to the Federal Acquisition Regulation and the NASA FAR Supplement. No additional funds above the initially specified contract value will be available.

V. Reporting Requirements

The following reports will be required of awarded proposals. In cases where subcontract arrangements exist, consolidated project reports, including financial reports, must be submitted and are the responsibility of the PI. The proposed budget should provide for these reporting requirements.

In this context “Annual” refers to a calendar year task effort which commences at contract award. All written reports and review presentation material should be submitted to the ACT Program Manager in electronic format or paper copy 10 days prior to the review.

A. Reports:

The initial bimonthly report should include a plan for technical, schedule and resource activities for the year and a quad chart. Following submittal of the initial bimonthly report, the technical and schedule status reports shall be submitted on a bimonthly basis and financial reports shall be submitted monthly. A teleconference may be conducted

between the ESTO and the awardee to review and discuss each report. These reports must include:

1. Technical status: The awardee must summarize accomplishments for the preceding two months, including technical accomplishments (trade study results, requirements analysis, design, etc.), technology development results, and results of lab tests or demonstrations.
2. Schedule status: The awardee must address the status of major tasks and the variance from planned versus actual, including tasks completed, tasks in process and expected to complete later than planned, tasks that are delayed starting with rationale for each, and recovery plans as appropriate.
3. Financial status: The financial status should be monthly and cumulative planned and actual cost. The awardee must address:
 - (a) The variance of planned versus actual costs, and include work that has been completed and cost incurred from the project (should be traceable to the schedule),
 - (b) The status of major procurements that have been incurred to date, and
 - (c) The amounts obligated to suppliers and subcontractors, including open purchase orders against which materials have not been received nor services rendered.
4. Quad Chart: The initial bimonthly report shall include a quad chart that contains the following information:
 - a. First Quadrant: Include a visual, graphic, or other pertinent information
 - b. Second Quadrant: “Description and objectives”
 - c. Third Quadrant: “Approach” and “Co-I’s/Partners”
 - d. Fourth Quadrant: “Schedule and Deliverables” and “Application/Missions”

The Earth Science Technology Office will provide a template for the quad chart. The quad chart, submitted with the initial bimonthly report, shall be updated annually.

An initial assessment of the Technology Readiness Level should be provided and the basis for that assessment for the critical technology developments of the activity. The first TRL assessment is to be provided with the initial bimonthly report. An updated TRL assessment must be provided with each annual review.

Bi-monthly reports shall be submitted in Microsoft Word or Powerpoint compatible formats.

B. Mid-Phase Review:

The awardee must present a presentation summarizing the work accomplished and results leading up to this mid-year milestone review and address:

1. Describe the primary findings, technology development results, and technical status, e.g., status of elements, construction of breadboards or prototype implementations, results of tests and/or proof-of-concept demonstrations, etc. The PI may provide a laboratory demonstration, if appropriate, to show technical results and status.
2. Describe the work planned for the remainder of the year and critical issues that need to be resolved to successfully complete the remaining planned work.
3. Summarize the cost and schedule status of the project, including any schedule slippage/acceleration.

The ESTO will conduct a two hour (approximately) review at a mutually agreed upon location. The presentation package will constitute the interim report and shall be submitted in Microsoft Word or Powerpoint compatible formats.

C. End-of-Phase Review:

The awardee must provide a presentation summarizing the work accomplished and anticipated results at the end of each year. This review must include:

1. A description of the work accomplished and the results leading up to this review.
2. A summary of the primary findings, technology development results, and technical status, e.g., status of elements, construction of breadboards or prototype implementations, results of tests and/or demonstrations, etc. The PI may provide a laboratory demonstration, if appropriate, to show technical results and status.
3. A recommendation on whether to continue the effort, if applicable, and the rationale for that recommendation.

The ESTO will conduct a two hour (approximately) review at the PI's facility, or at a mutually agreed upon location at approximately one month prior to the end of the award period. **Exercise of subsequent option(s) will be decided based upon the results of the Annual Review(s).**

D. Annual Report:

The annual report should be submitted within 10 days following the Annual Review, and should include the following:

1. Background and description of the measurement concept. Description of the Earth science questions addressed by the measurement system.
2. Results of all analyses, measurement system designs, breadboards and/or prototype implementations and designs.
3. Performance analysis results of tests and/or demonstrations; estimation of reduction of size, mass, power, volume, cost, improved performance, or description of enabled capability not previously possible; and documentation of technology dependencies.
4. Tables, graphs, diagrams, curves, sketches, photographs and drawings in sufficient detail to explain, comprehensively, the results achieved.
5. An updated TRL assessment, with a description of the follow-on activities remaining and a rough order of magnitude cost and schedule estimate to build a flight model.

The annual report shall be submitted in Microsoft Word compatible format.

E. Annual Workshop:

If held, the awardee is encouraged, and may be required, to participate in an annual workshop. The purpose of the workshop, which will be open to the public, is to widely advertise the technology developments invested by the ESTO. In the workshop, the awardee should be prepared to make a presentation, provide a paper, or create a poster providing a description of the project, the objectives, approach, technical status, and schedule information. In cases where cost-sharing arrangements exist for a particular award, participation in the workshop does not require disclosure of data that would compromise the exclusive rights of the awardee. These annual workshops will be held at or near NASA Field Centers. As guidance for pricing, the workshops will be approximately three days in length. The 2002 workshop will be held in the Pasadena, California area, and the 2003 workshop will be held in the Cleveland, Ohio area. The location of subsequent workshops will be determined at a later date.

CURRENT AND PENDING RESEARCH SUPPORT FROM ALL OTHER SOURCES

All proposals must include this information. This list should include all current and pending research support from the following sources:

1. Any proposal for which the PI of this proposal is also the Principal Investigator.
2. Any proposal, regardless of the PI, which accounts for more than 20% of the time of the Principal Investigator of this proposal and other personnel essential to this proposal.

Please provide this information in the following format:

I. Principal Investigator

A. Current Fiscal Year Support

1. Source of Support and Principal Investigator
2. Award Amount and Period of Performance
3. Person-Months and Level of Effort
4. Project Title and Short Abstract (50 words or less)

B. Pending Proposals (Excluding this proposal but including other proposals).

1. Source of Support and Principal Investigator
2. Award Amount and Period of Performance
3. Person-Months and Level of Effort
4. Project Title and Short Abstract (50 words or less)

For both current and pending support provide information on:

II. Co-Investigators

As outlined above, provide information on all Current and Pending Support. Disclosure of current and pending research support is not required for collaborators.

III. Other agencies to which this proposal, or parts thereof, has been submitted.

PROPOSAL SUMMARY (1-PAGE ONLY)

NASA Research Announcement 02-OES-XX

For reference only - must be entered at <http://proposals.hq.nasa.gov/>

ABSTRACT: (Single-space, typed, about 200-300 words). Include: (a) Objectives and justification for work; (b) Accomplishments of prior work; (c) Outline of proposed work and methodology; (d) One or two relevant recent publications authored by the PI or Co-I.

APPENDIX B

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS

NASA Federal Acquisition Regulation (FAR), Supplement (NFS) Part 1852.235-72 , Effective JANUARY 2000 (Modified)

(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 pre-award 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) NRAs 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 NRAs.

(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 NRAs are subject to the Federal Acquisition Regulation and the NASA FAR Supplement. 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 NRAs; 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) The following information is needed to permit consideration in an objective manner. NRAs 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.

Notice
Restriction on Use and Disclosure of Proposal Information

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.

(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 (U.S. Proposals Only).

(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).

(iv) Use of NASA funds--NASA funding may not be used for foreign research efforts at any level, whether as a collaborator or a subcontract. The direct purchase of supplies and/or services, which do not constitute research, from non-U.S. sources by U.S. award recipients is permitted. Additionally, in accordance with the National Space Transportation Policy, use of a non-U.S. manufactured launch vehicle is permitted only on a no-exchange-of-funds basis.

(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.

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

(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) Additional Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation.

- (1) NASA welcomes proposals from outside the U.S. However, foreign entities are generally not eligible for funding from NASA. Therefore, unless otherwise noted in the NRA, proposals from foreign entities should not include a cost plan unless the proposal involves collaboration with a U.S. institution, in which case a cost plan for only the participation of the U.S. entity must be included. Proposals from foreign entities and proposals from U.S. entities that include foreign participation must be endorsed by the respective government agency or funding/sponsoring institution in the country from which the foreign entity is proposing. Such endorsement should indicate that the proposal merits careful

consideration by NASA and, if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

(2) All foreign proposals must be typewritten in English and comply with all other submission requirements stated in the NRA. All foreign proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date. Those received after the closing date will be treated in accordance with paragraph (g) of this provision. Sponsoring foreign government agencies or funding institutions may, in exceptional situations, forward a proposal without endorsement if endorsement is not possible before the announced closing date. In such cases, the NASA sponsoring office should be advised when a decision on endorsement can be expected.

(3) Successful and unsuccessful foreign entities will be contacted directly by the NASA sponsoring office. Copies of these letters will be sent to the foreign sponsor. Should a foreign proposal or a U.S. proposal with foreign participation be selected, NASA's Office of External Relations will arrange with the foreign sponsor for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency or funding institution will each bear the cost of discharging their respective responsibilities.

(4) Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

- (i) An exchange of letters between NASA and the foreign sponsor; or
- (ii) A formal Agency-to-Agency Memorandum of Understanding (MOU).

(m) Export Control Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation.

(1) U.S. proposals including foreign participation must include a section discussing compliance with U.S. export laws and regulations, e.g., 22 CFR Parts 120-130 and 15 CFR Parts 730-774, as applicable to the circumstances surrounding the particular foreign participation. The discussion must describe in detail the proposed foreign participation and is to include, but not limited to, whether or not the foreign 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 at <http://www.pmdtc.org> and <http://www.bxa.doc.gov>. Proposers are advised that under U.S. law and regulations, spacecraft and their specifically designed, modified, or configured systems, components, and parts are generally

considered “Defense Articles” on the United States Munitions List and subject to the provisions of the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130.

(n) Cancellation of NRA.

- (1) 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)

Appendix C Required Proposal Cover Pages

Two proposal cover pages are required as part of the proposal. The first is a hard copy (see Appendix D) that must be signed by the Principal Investigator and an official by title of the investigator's organization who is authorized to commit the organization. This authorizing signature also certifies that the proposing institution has read and is in compliance with the required certifications printed in full, therefore, these certifications do not need to be submitted separately. This page will not be counted against the page limit of the proposal.

The second proposal cover page must be submitted electronically to the SYS-EYFUS Web site located at <http://proposals.hq.nasa.gov/>.

If the proposer obtained a User ID and password in the process of submitting a proposal for a previous research opportunity announcement, the same user UserID and password can be used to complete the electronic proposal cover page in response to this research opportunity announcement. Be sure to click on "Edit Personal Information" if any of your correspondence information in the SYS-EYFUS is not current.

If you do not have a SYS-EYFUS UserID or password, you may obtain one electronically by going to HYPERLINK <http://proposals.hq.nasa.gov> and performing the following steps:

- Click the hyperlink for new user which will take you to the Personal Information Search Page.
- Enter your first and last name. SYS-EYFUS will search for your record information in the SYS-EYFUS database.
- Confirm your personal information by choosing the record displayed.
- Select continue, and a User ID and password will be e-mailed to you.

Once you receive your User ID and Password, login to the SYS-EYFUS Web site and follow the instructions for New Proposal Cover Page.

Proposers without access to the Web or who experience difficulty in using this site may contact the Help Desk at proposals@hq.nasa.gov (or call 202.479.9376) for assistance. After you have submitted your proposal cover page electronically, if you are unsure if it has been successfully submitted, do not re-submit. Please call the Help Desk. They will be able to promptly tell you if your submission has been received. Please note that submission of the electronic cover page does not satisfy the deadline for proposal submission.

Appendix D



Proposal Cover Page

Proposal Number: _____

Date: ___/___/_____

Name of Submitting Institution: _____

Congressional District: _____

Proposal Title:	
Name of Submitting Institution:	Congressional District:

Certification of Compliance with Applicable Executive Orders and US Code

By submitting the proposal identified in this *Cover Sheet/Proposal Summary* in response to this Research Announcement, the Authorizing Official of the proposing institution (or the individual proposer if there is no proposing institution) as identified below:

- certifies that the statements made in this proposal are true and complete to the best of his/her knowledge;
- agrees to accept the obligations to comply with NASA award terms and conditions if an award is made as a result of this proposal; and
- confirms compliance with all provisions, rules, and stipulations set forth in the two Certifications contained in this NRA [namely, (i) *Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs*, and (ii) *Certifications, Disclosures, And Assurances Regarding Lobbying and Debarment & Suspension*].

Willful provision of false information in this proposal and/or its supporting documents, or in reports required under an ensuing award, is a criminal offense (U.S. Code, Title 18, Section 1001).

NASA PROCEDURE FOR HANDLING PROPOSALS

This proposal shall be used and disclosed for evaluation purposes only, and a copy of this Government notice shall be applied to any reproduction or abstract thereof. Any authorized restrictive notices that the submitter places on this proposal shall also be strictly complied with. Disclosure of this proposal for any reason outside the Government evaluation purposes shall be made only to the extent authorized by the Government.

Principal Investigator Name:		Authorized Institutional Official Name:	
Organization:		Organization:	
Department:		Department:	
Mailing Address:		Mailing Address:	
City, State Zip:		City, State Zip:	
Telephone Number:		Telephone Number:	
Fax Number:		Fax Number:	
Email Address:		Email Address:	
 Principal Investigator Signature:	 _____	 Authorized Institutional Official Signature:	 _____
Date:	_____	Date:	_____

Co-Investigator:				
Name	Telephone	Email	Institution	Address

Budget:	
<u>Year</u>	
1	
2	
3	
<u>Total</u>	

**Assurance 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 1972 (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 it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, 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 recognizes and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear on the Proposal Cover Sheet above are authorized to sign on behalf of the Applicant.

NASA FORM 1206 JUN 2001 PREVIOUS EDITIONS ARE OBSOLETE

**CERTIFICATIONS, DISCLOSURES, AND ASSURANCES
REGARDING LOBBYING AND DEBARMENT & SUSPENSION**

1. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 14 CFR Part 1271, as defined at 14 CFR Subparts 1271.110 and 1260.117, with each submission that initiates agency consideration of such applicant for award of a Federal contract, grant, or cooperative agreement exceeding \$ 100,000, the applicant must certify 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 an 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 continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than 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 the Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit a 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.

2. GOVERNMENTWIDE DEBARMENT AND SUSPENSION

As required by Executive Order 12549, and implemented at 14 CFR 1260.510, for prospective participants in primary covered transactions, as defined at 14 CFR Subparts 1265.510 and 1260.117—

(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 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 a 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.

APPENDIX E
BUDGET SUMMARY

For period from _____ to _____

- Provide a complete Budget Summary for year one and separate estimated for each subsequent year.
- Enter the proposed estimated costs in Column A (Columns B & C for NASA use only).
- Provide as attachments detailed computations of all estimates in each cost category with narratives as required to fully explain each proposed cost. See Instructions For Budget Summary on following page for details.

NASA USE ONLY			
	A	B	C
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. Indirect Costs*	_____	_____	_____
4. Other Applicable Costs	_____	_____	_____
5. Subtotal--Estimated Costs	_____	_____	_____
6. Less Proposed Cost Sharing (if any)	_____	_____	_____
7. Carryover Funds (if any)			
a. Anticipated amount :	_____	_____	_____
b. Amount used to reduce budget	_____	_____	_____
8. Total Estimated Costs	_____	_____	XXXXXXXX
9. APPROVED BUDGET	XXXXXXX	XXXXXXXX	_____

*Facilities and Administrative Costs.

Instructions for Budget summary

1. Direct Labor (salaries, wages, and fringe benefits): Attachments should list the 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 NASA Grant Officer. Any equipment purchase requested to be made as a direct charge under this award must include the equipment description, how it will be used in the conduct of the basic research proposed and why it cannot be purchased with indirect funds.
 - d. Supplies: Provide general categories of needed supplies, the method of acquisition, and the estimated cost.
 - e. Travel: Describe the purpose of the proposed travel in relation to the grant and provide the basis of estimate, including information on 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 F&A 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 explaining the need for each item.
 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 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 award of a multiple year award).
- Total Estimated Costs: Enter the total after subtracting items 6 and 7b from item 5.

* Facilities and Administrative (F&A) Costs

APPENDIX F

DEFINITION OF TECHNOLOGY READINESS LEVELS

- TRL 1** Basic principles observed and reported
- TRL 2** Technology concept and/or application formulated
- TRL 3** Analytical and experimental critical function and/or characteristic proof-of-concept
- TRL 4** Component and/or breadboard validation in laboratory environment
- TRL 5** Component and/or breadboard validation in relevant environment
- TRL 6** System/subsystem model or prototype demonstration in a relevant environment (ground or space)
- TRL 7** System prototype demonstration in a space environment
- TRL 8** Actual system completed and “flight qualified” through test and demonstration (ground or space)
- TRL 9** Actual system “flight proven” through successful mission operations

APPENDIX G

LIST OF ACRONYMS USED IN THIS RESEARCH ANNOUNCEMENT

AO	Announcement of Opportunity
ACT	Advanced Component Technology
CN-SAT	Capability Needs for Science, Applications and Technology
EOS	Earth Observing System
ESE	Earth Science Enterprise
FAR	Federal Acquisition Regulation
FY	Fiscal Year
GSFC	Goddard Space Flight Center
IIP	Instrument Incubator Program
NASA	National Aeronautics and Space Administration
NFS	NASA FAR Supplement
NRA	NASA Research Announcement
OES	Office of Earth Science
OMB	Office of Management and Budget
PI	Principal Investigator
SBIR	Small Business Innovation Research (SBIR)
SBTP	Space Based Technology Program
TRL	Technology Readiness Level
URL	Uniform Resource Locator
WWW	World Wide Web