



National Aeronautics and Space Administration
Office of Equal Opportunity Programs (OEOP)
Minority University Research and Education Division (MURED)

FY 2000 NASA RESEARCH ANNOUNCEMENT (NRA) FOR EDUCATIONAL PROPOSALS

(NRA 00 OEOP-2)

- **Partnership Awards for the Integration of Research into Undergraduate Education (PAIR) NRA 00 OEOP-2A**
 - **Minority University Mathematics, Science and Technology Awards for Teacher Education Program (MASTAP) NRA 00 OEOP-2B**
 - **Precollege Awards for Excellence in Mathematics, Science, Engineering, and Technology (PACE/MSET) NRA 00 OEOP-2C**
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Important Program Dates

NRA 00 OEOP- 2A **Partnership Awards for the Integration of Research into Mathematics, Science, Engineering & Technology Undergraduate Education (PAIR)**

Release Date: September 15, 1999
Notice of Intent Due: November 1, 1999
Proposals Due: December 1, 1999
Selection Announcement: January 2000

NRA 00 OEOP- 2B **Minority University Mathematics, Science and Technology Awards for Teacher Education Program (MASTAP)**

Release Date: September 15, 1999
Notice of Intent Due: November 8, 1999
Proposals Due: December 8, 1999
Selection Announcement: January 2000

NRA 00 OEOP- 2C **Precollege Awards for Excellence in Mathematics, Science, Engineering, and Technology (PACE/MSET)**

Release Date: September 15, 1999
Notice of Intent Due: November 15, 1999
Proposals Due: December 15, 1999
Selection Announcement: January 2000

INQUIRIES

General questions about this NASA Research Announcement (NRA) must be submitted via e-mail to muredsupport@lan.alliedtech.com. Technical and scientific questions about programs in this NRA may be directed to the following NASA Minority University Research and Education Division staff:

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**NASA OFFICE OF EQUAL OPPORTUNITY PROGRAMS
MINORITY UNIVERSITY RESEARCH AND EDUCATION DIVISION**

This NASA call for proposals streamlines the solicitation process by combining three minority university education programs into one announcement. The NASA Research Announcement includes opportunities in the following categories: the Partnership Awards for the Integration of Research into Mathematics, Science, Engineering and Technology Undergraduate Education (PAIR); the Minority University Mathematics, Science and Technology Awards for Teacher Education Program (MASTAP); and the Precollege Awards for Excellence in Mathematics, Science, Engineering, and Technology (PACE/MSET).

The PAIR announcement provides an opportunity for Historically Black Colleges and Universities (HBCUs) and Other Minority Universities (OMUs), which include Hispanic Serving Institutions (HSIs) and Tribal Colleges and Universities (TCUs), to build upon their NASA-sponsored research across academic disciplines by creating innovative approaches to the inter-disciplinary study of math, science, engineering, and technology (MSET). The purpose of the PAIR Award is to strengthen teaching and education strategies across academic programs at HBCUs and OMUs. This inter-disciplinary partnership must span more than one MSET academic program, creating a collaborative effort among different MSET departments. Partners may include NASA Centers and the Jet Propulsion Laboratory (JPL), and other institutions of higher education and the aerospace community, having substantial involvement in NASA's mission to strengthen the MSET academic infrastructure of MIs.

The purpose of the MASTAP Award is to strengthen HBCU's and OMU's teacher education programs, and thereby increase the number and percentage of certified mathematics, science, and technology teachers who are employed and retained in hard to staff schools. The project must be a collaborative effort between the institution's teacher education program, and the departments of mathematics, science or technology, and a school district with predominant enrollment of socially and economically disadvantaged and/or disabled students.

The PACE/MSET announcement provides minority institutions (MIs) an opportunity to develop broad and superior education programs for mathematics, science and technology at the pre-college level. The proposal must be a collaborative effort between the MI and the school district or non-profit education organization committed to serving socially and economically disadvantaged and/or disabled students.

This NRA is responsive to all Federal mandates related to HBCUs and OMUs. The awards will be made based on merit review. NASA funding beyond the first year is based on an annual evaluation of documented progress, the availability of funds and the amount of funds reported in the Agency's Financial and Contractual Status (FACS) Report as unexpended at the end of each year's period of performance. General information pertaining to all of the programs is at the beginning of the NRA followed by specific project information and requirements for PAIR, MASTAP, and PACE/MSET.

We appreciate your interest and participation in NASA programs.

George E. Reese
Associate Administrator
Office of Equal Opportunity Programs

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I. INTRODUCTION

The NASA Office of Equal Opportunity Programs Minority University Research and Education Division (OEOP MURED) solicits educational proposals from Historically Black Colleges and Universities (HBCUs) and Other Minority Universities (OMUs), including Hispanic Serving Institutions (HSIs) and Tribal Colleges and Universities (TCUs). NASA OEOP MURED effectively exercises its statutory authority "to create at Minority Institutions (MIs) systemic and sustainable change through partnerships and programs that enhance research, training, and educational outcomes in NASA-related fields..." and to "increase the number of students served by MIs prepared to enter college and successfully pursue and complete degrees in NASA-related fields."

In an effort to advance the governing mandates and contribute to the Agency's mission and education outcomes, this announcement solicits educational proposals in the following three categories:

1. Partnership Awards for the Integration of Research into Mathematics, Science, Engineering and Technology Undergraduate Education (PAIR)

The purpose of the PAIR Award is to enhance undergraduate faculty teaching and the student's education across MSET disciplines by integrating the NASA research investment at the HBCU or OMU into the undergraduate MSET courses and curricula specifically related to NASA Strategic Enterprise missions and human resources requirements. This inter-disciplinary partnership must span more than one MSET academic programs, creating a collaborative effort among MSET departments.

Each award will consist of an annual grant not to exceed \$300,000 per year for a maximum of 4 years.

2. Minority University Mathematics, Science and Technology Awards for Teacher Education Program (MASTAP)

The purpose of the MASTAP Award is to strengthen HBCUs and OMUs teacher education programs and thereby increase the number and percentage of certified mathematics, science, and technology teachers who are employed and retained in hard to staff schools. As a result of this award, the institution will graduate more certified mathematics, science, and technology teachers with knowledge of national and state MSET standards. The teachers will also be encouraged to use NASA's educational resources to enhance their knowledge and to foster the effective implementation of the program's goals and objectives.

Each award will consist of an annual grant not to exceed \$200,000 per year for a maximum of 3 years.

3. Precollege Awards for Excellence In Mathematics, Science, Engineering, and Technology (PACE/MSET)

The purpose of the PACE/MSET Award is to enhance the capabilities of socially and economically disadvantaged students in college preparatory courses in mathematics, science, engineering, and technology through outreach projects that are a collaborative effort between the minority university, school district or nonprofit education organization committed to serving socially and economically disadvantaged and/or disabled students.

Each award will consist of an annual grant not to exceed \$100,000 per year for up to three years.

Funding beyond the first year of awards will be based on an annual evaluation of documented progress as reflected in the annual report, which includes the OEOP MURED's Uniform Outcomes Report. Funding is also based on the availability of funds and the amount of funds reported in the Agency's Financial and Contractual Status (FACS) Report as disbursed at the end of the award's period of performance.

Supplemental Funding for the Inclusion of Individuals with Targeted Disabilities

NASA is fully committed to implementing all Federal laws, regulations and guidelines related to the development of affirmative employment plans and inclusion of persons with disabilities. Therefore, we strongly encourage the participation of persons with disabilities in PAIR, MASTAP, and PACE/MSET. To facilitate the participation of individuals with disabilities, NASA MURED will provide up to \$5,000 in supplemental funding for special assistance and/or equipment to enable the Principal Investigator (PI) and Co-Principal Investigator (Co-PI) to perform work under the awards.

Proposals denoting request for supplemental funding must include a detailed one-page description of the request, as well as the budget and budget justification narrative, and Form 256 (See Appendix D – Form 3a), completed by the individual for whom the request is being made. (See Appendix A for the legal definition of disabled.)

PLEASE NOTE: The Government is not obligated to make awards as a result of this research announcement. Funds are not presently available for this program. It is anticipated that funds will become available during the next fiscal year to finance this program. If funding does not become available, NASA has no obligation to make awards resulting from this announcement.

II. GENERAL ELIGIBILITY REQUIREMENTS

Institutions

All proposals must originate from the following U.S. colleges or universities, designated by the Department of Education as a minority institution in 1999, and identify themselves as one of the following:

1. Must be an accredited minority college or university with enrollment of a single underrepresented minority group or the combination of underrepresented minority groups that exceeds 50 percent of the total student enrollment as defined in the Higher Education Act as amended (see 20 USC 1135d and 34 CFR 637.4b);
2. Must be a Hispanic-Serving Institution under Title III of the *Higher Education Act of 1965*, as amended [See 20 USC 1059 ©; Public Law 102-325, Section 306, July 22, 1992]; and/or
3. Must be a Historically Black College or University under Title III of the *Higher Education Act of 1965*, as amended (see 34 CFR 608.2); and/or
4. Tribal Colleges and Universities must be cited in Section 532 of the Equity in Educational Land Grant Status October of 1994; Tribally Controlled Community College Assistance Act of 1978; or the Navajo Community College Assistance Act of 1978, Public Law 95-471.

A list of the Department of Education minority institutions can be accessed at: <http://www.ed.gov>

Additional requirements are listed in the Program Section for the respective award. Any arrangements and/or agreements to have the administration of the award performed by a third party is between the awardee and the third party and does not require NASA's involvement. However, the award will be made to the minority institution.

Principal Investigators

The principal investigator (PI) must be a U.S. citizen and an employee of the institution. Principal Investigators must devote at least 25 percent of their time to the project.

A PI can be named in only one proposal in response to this announcement (NRA 00 OEOP-2).

III. PROPOSAL GUIDELINES AND SUBMISSION INSTRUCTIONS

Proposal Guidelines

General guidelines for proposal preparation are given in Appendix C, Instructions for Responding to NASA Research Announcements. However, certain sections listed in Appendix C must be appropriately modified to meet the intent of the respective programs. For convenience, the information that follows augments the descriptions in Appendix C.

1. If substantial collaborations with other institutions are intended, include summary statements identifying each endorsing partner, their contribution, and the name and signature of the responsible officer or manager at the institution. The summary statements are limited to two pages.
2. Submit five copies, numbered one through five, by the deadline specified. A submitted proposal should be no more than 30 pages in length, using standard-sized paper (8.5x11), one-inch margins (top, bottom, left and right), and 12-point font. Certifications, appendices, forms, and figures, e.g., depicting research schedule, are desired but must fit within the 30-page limit. To facilitate the recycling of proposals after

review, proposals should be submitted on plain, white paper only. The use of cardboard stock, plastic covers, colored paper, etc., is prohibited.

Budget Guidelines

The "Proposed Costs" discussed in Section (8) of Appendix C is supplemented by the following information concerning proposal cost detail.

1. The proposal must contain sufficient cost detail and supporting information to facilitate a speedy evaluation and award. The proposed cost information should be sufficiently detailed to allow the Government to identify cost elements for evaluation purposes (See Appendix D, Form D-6). Generally, the Government will evaluate cost in terms of their reasonableness and acceptability. Each category should be explained. Offerors should exercise prudent judgment since the amount of detail necessary varies with the complexity of the proposal.
2. Direct labor costs should be separated by titles or disciplines such as Principal Investigator, clerical support, with percent of time. Please note, it is OEOP policy to not fund more than twenty five percent of direct cost salaries. Estimates should include a basis of estimates such as, currently paid rates or outstanding offers to prospective employees. Indirect costs should be explained to the extent that allows the Government to understand the basis of the estimates.
3. With regard to other costs, each significant category should be detailed, explained, and substantiated. For example, proposed equipment purchases should specify the type of equipment, number of units, and unit cost. Requested travel allowances should include the number of trips, duration of each trip, per diem, rental car expenses, etc.
4. Indirect costs are included in the award amounts.

Proposal Format, Content, and Page Limitations

The proposal should be submitted according to the order listed in the following table and should not exceed 30 pages including certifications, forms, endorsement letters and appendices. Each proposal should adhere to the table guidelines for the maximum number of pages for that section.

PROPOSAL FORMAT, CONTENT, AND PAGE LIMITATIONS TABLE

PLEASE NOTE: PROPOSALS MUST NOT EXCEED 30 PAGES, INCLUDING CERTIFICATIONS, FORMS, AND APPENDICES.

	PROPOSAL CONTENT	Page Guideline	Form Number and References
	1. Proposal Cover Page: The proposal cover sheet must be signed by an institutional official who is authorized to certify institutional support and sponsorship of the investigation and of the management of the proposal.	1	Form D-1 Appendix D
	2. Table of Contents	1	

	PROPOSAL CONTENT	Page Guideline	Form Number and References
	3. Proposal Abstract (200-300 words). Include the following: a description of the project's objectives, number of participants in the project, method of approach, and the measurable outcomes.	1	Appendix D Form D-8 Appendix C (3)
	4. Certification of Institution and Faculty Eligibility Form	1	Appendix D Form D-2
	1. Self Identification of Handicap (optional)	1	Appendix D Form D-3
	6. Certifications Regarding Lobbying, Debarment, Suspension and Other Responsibility Matters and Drug-Free Workplace Requirements Form. (This form <u>does not have to be submitted</u> with the proposal. The authorizing institutional signature on the Proposal Cover Page certifies that the proposing institution has read and is in compliance with these certifications)		Appendix D Form D-4
	7. Proposal Data	1	Appendix D Form D-5
	8. Relevance to NASA: Include how the proposal relates to NASA interests.	2	Section IV (Evaluation Criteria)
	9. Project Description: Narrative should include objectives that are specific, measurable, achievable, and realistic within a stated time period. Include a detailed plan describing involvement of socially and economically disadvantaged and disabled students who are US citizens. Detail how the expected students outcomes and progress will be determined and documented.	6	Appendix C Section IV (Evaluation Criteria)

	PROPOSAL CONTENT	Page Guideline	Form Number and References
	10. Management Approach	2	Section IV (Evaluation Criteria) Appendix C (5)
	11. Personnel: Submit proposer vitae, including academic record and listing of relevant publications. A single-page bibliography including no more than five publications relevant to the proposed research may be included as an appendix.	2	Section IV (Evaluation Criteria) Appendix C (6)
	12. Proposed Cost: The budget section should include a budget breakdown for each year of the proposed work, as well as a budget summary for the entire period of the proposal. Include the total budget request and estimates for each year. Summary budget by year for each of the years. Student support should be categorized under the "Other" section (2.f) of the Budget Form. Narrative: Include explanatory notes for each line item in the budget. Funding limitation <u>includes</u> indirect costs.	4	Appendix D Form D-6 Section IV (Evaluation Criteria) Appendix C (8)
	13. Proposal Equipment List	1	Appendix D Form D-7
	14. Appendices:		
	<ul style="list-style-type: none"> • University Commitment Statement A description of the university's support and resource commitments. • Single-Page Bibliography • Summary of endorsements from partners, outlining specific commitment and support of the project 	1 1 2	

Proposal Submission

To assist in expediting the evaluation, selection and award processes, please submit the following forms electronically: Proposal Cover Page (Form D-1), Proposal Data (Form D-5), Budget Page (Form D-6), and the Proposal Abstract (Form D-8). The forms can be accessed online at: <http://mured.alliedtech.com>

Hardcopies of the proposals are required and are considered the official time stamp of submission. There is an optional feature to electronically upload your proposal from the Proposal Submission System. However, if you use this option you must also submit the proposal by mail.

The original and 6 copies of the proposal package must be received at NASA headquarters no later than 4:30 p.m., Eastern Standard Time, on the Proposal Due Date (**See Program Due Dates**). Proposals received after this time are ineligible for consideration. This supercedes Section (g) of Appendix C (Instructions for Responding to NASA Research Announcements NASA Supplementary Regulations).

Program Deadlines are:

PAIR (NRA 00 OEOP-2A) December 1, 1999
MASTAP (NRA 00 OEOP-2B) December 8, 1999
PACE, MSET (NRA 00 OEOP-2C) December 15, 1999

Proposals sent through the U.S. Postal Service by first class, registered or certified mail should be addressed to the appropriate program contact as follows:

Dr. Mabel Matthews
(PAIR) NRA 00 OEOP-2A

Ms. Millie Mateu
(MASTAP) NRA 00 OEOP-2B

Ms. Mary Anne Stoutsenberger
(PACE) NRA 00 OEOP-2C

Mailing Address:

Code EU
NASA Headquarters
Washington, DC 20546-0001

NOTE: PLEASE INCLUDE THE APPROPRIATE PROGRAM AND NRA NUMBER UNDER THE CONTACT PERSON'S NAME AS LISTED.

Proposals submitted **via commercial delivery or courier service** should state the appropriate award contact person and the following address:

Code EU
Attention: Receiving and Inspection (Rear of Building)
300 E Street, SW
Washington, DC 20024-3210

IV. PROPOSAL COMPLIANCE, EVALUATION, AND AWARDS PROCESS

Proposal Compliance

All proposals must comply with the general requirements of the NRA. Upon receipt, proposals will be reviewed for compliance. This includes:

1. Submission of complete proposals on or before the due date specified in Important Program Dates (Page 2) of this NRA.
2. Submission of a proposal from an eligible minority institution, specified in the General Eligibility Requirements (Section II).
3. Submission of proposals that are no more than 30 pages in length.
4. Submission of a budget that is within guidelines specified in this NRA and is for a funding period not exceeding three years in duration.
5. Submission of all other appropriate forms as required by this NRA (See Appendix D).

Note: At NASA's discretion, non-compliant proposals may be withdrawn from the review process and returned to the proposer without further review.

Evaluation Criteria

Proposals will be evaluated based on the following criteria: Relevance, Intrinsic Merit, Management Approach, Human Resource Development and Proposed Cost. The criteria are listed in descending order of importance. For example, Relevance is more important than Intrinsic Merit. Creativity in the approach and the forethought given to each aspect of the design and procedure will be carefully considered and will play a major role in the review process. A strong emphasis should be placed on innovative projects with cohesive, collaborative strategies with measurable outcomes. By design, aspects of some issues are touched upon in more than one category.

1. Relevance to NASA

The proposal must clearly describe how the project relates to NASA's Minority University Research and Education Program (MUREP) goals and to one or more of the following:

- NASA's Strategic Enterprises,
- NASA Center/JPL Center of Excellence Core Areas of Responsibility.

(See Appendix B for web addresses)

MUREP goals are to:

- Facilitate research and development activities at MIs that contribute substantially to NASA's Mission;
- Create systematic and sustainable change at MIs through partnerships and programs that enhance research and educational outcomes in NASA-related fields;
- Prepare faculty and students at MIs to successfully participate in the NASA Strategic Enterprises' competitive research and education processes; and
- Partner with MIs to increase the number of students prepared to enter college and successfully pursue and complete degrees in NASA-related fields.

The proposal's relevance to NASA and MUREP goals is essential. Partnerships between NASA and MIs provide an enormous opportunity for NASA to contribute to society by increasing the representation of underrepresented minorities in education, research, and careers in mathematics, science, engineering and technology. Thus, it is imperative that the PI address this issue in their proposal to provide reviewers with the information necessary to respond fully to merit review criteria.

2. Intrinsic Merit

The proposal will be critically reviewed to assess the overall project design and content, strength of the partnership(s), and its likeliness to produce outcomes to advance NASA's mission and MUREP goals. A critical assessment will be made of the technical approach of the proposed project as well as the structure and content of the overall project design. The assessment will include: the uniqueness of the project design and the logic underlying it; the thoroughness of the proposed approach; number and characteristics of faculty and students who will be affected by the proposed project; the sufficiency of the evaluation process (including outcome metrics) and dissemination plan; and likelihood that the project can garner additional funds both during and after OEOP funding. Include a list of major accomplishments planned by end of the performance period.

3. Management Approach

The proposal will be critically assessed to determine the likeliness of the personnel to bring about the proposed results, as evidenced by the resources, capabilities, responsibilities, roles and level of involvement of each partner. Therefore, the proposal should clearly and concisely describe the management approach to be used in implementing the proposed project. Indicate any unique aspects of this project's approach, and describe how the project activities will be integrated into existing programs within your University. Specifically, the review will focus on:

- (a) The soundness of the approach and methods the partners intend to employ to address the stated problem and accomplish the project's objectives;
- (b) The scope of the project in relation to timeframe and resources;
- (c) The outcomes of the project in relation to approach and timeframe
- (d) What specific audience(s) are targeted by the proposal and the number of participants in the project;
- (e) The methods for communicating, coordinating, and managing activities within the project;
- (f) Notable collaborations with other institution(s) and organization(s) (where appropriate); and
- (g) Significance/impact of the proposed project on NASA and the Minority Institution(s), including evaluation, dissemination and any educational materials, resources, or methods produced by the project.

4. Human Resource Development

The extent to which the institution's proposal will contribute to increasing the number and percentage of degrees awarded to U.S. citizens who have been historically underrepresented in NASA-related fields, and the extent to which the proposed effort will contribute directly to the recruitment and retention of more students in mathematics, science, engineering, and technology courses. Evidence of previous academic year enrollments and degrees awarded and the adequacy of increasing the number and percent of underrepresented minorities, who are U.S. citizens, significantly above the pre-award performance.

Leadership qualities of the PI and the management team will be critically evaluated. Include clear evidence that the proposed project will result in the ability to collaborate successfully, delineate tasks judiciously, communicate effectively, and produce measurable results.

NASA strongly encourages the participation of individuals with targeted disabilities. Supplemental funding up to \$5,000 is available for the inclusion of persons with disabilities. (See the Introduction for detailed information)

5. Proposed Cost

The proposed cost must clearly and concisely describe the appropriateness of the budget, including reasonableness of proposed cost and cost elements, and cost-sharing. No more than 40 percent of the total program personnel and other administrative cost can be attributed to NASA. Service provided by NASA Centers or JPL will be identified as NASA or JPL responsibilities in the award. Proposers should contact, in advance, the NASA Center or JPL from which services will be requested in order to ascertain the availability and anticipated costs of such services. All costs incurred by NASA Centers and JPL for the use of facilities and contracted technical support will be funded from the total award. Therefore, to the extent that the performance of NASA or JPL responsibilities under the award entails the incurrence of such costs, the amount of funding made available to the recipient will be reduced accordingly. Cost incurred by NASA Centers for civil service salaries, travel, and in-house research will not affect the funding of the award. Include the extent of the partners' commitment of resources (staff, facilities, laboratories, indirect support, etc.) to the proposed research program.

All SOLICITATIONS must include the proposed cost, which clearly and concisely describes the appropriateness of the budget including the reasonableness of proposed cost, cost elements, and cost sharing. Cost per participant will be a factor in the evaluation of MASTAP projects.

Evaluation Techniques

Proposals will be evaluated on the basis of merit review. Reviews may include ad hoc mail reviews, panel reviews by recognized members of academia, and scientific experts as appropriate. External reviewers will be broadly representative of the various types of eligible organizations.

The reviewer will assess the proposals based on the five criteria outlined in Evaluation Criteria. Consideration will also be given to the feasibility of implementation of the results of the proposed work and project innovation.

NASA will assign the following ratings for use by the reviewer in evaluating each of the five criteria:

<u>ADJECTIVE</u>	<u>DEFINITION</u>
Excellent	A comprehensive and thorough proposal of exceptional merit, with numerous strengths and no major weaknesses.
Very Good	A proposal that demonstrates overall competence and is worthy of support. However, the proposal has a few minor correctable weaknesses.
Good	Proposals with a reasonable sound response. There are more strengths than weaknesses.
Fair	Proposals with strengths and weaknesses approximately equal. However, as a whole weaknesses are not offset by strengths.
Poor	Proposals with serious deficiencies and should not be supported. There are numerous weaknesses and few strengths.

The results of the peer review will be forwarded to the Director of NASA's Minority University Research and Education Division for categorization into the following ranges: highly competitive, competitive, and not competitive. The Associate Administrator for OEOP will select recipients from among the highly competitive range.

Solicitation Availability

A copy of the solicitation and the forms are available electronically via the Internet at the following address: <http://mured.alliedtech.com>.

Notice of Intent

To facilitate proposal processing and the selection of reviewers, prospective proposers should submit an electronic Notice of Intent (NOI) to confirm their plans to send in a proposal. The on-line form for the NOI can be accessed at: <http://mured.alliedtech.com>.

Refer to Important Program Dates (Page 2) for NOI deadlines.

Contact for Questions

If you have any questions pertaining to this solicitation you may call the appropriate NASA official listed at the beginning of this announcement, under Inquiries, or you may visit our Frequently Asked Questions (FAQ) page located at: <http://mured.alliedtech.com> on the Internet.

V. NOTIFICATION

NASA programs are highly competitive. By reading the entire solicitation document and then carefully following the instructions, you will avoid the problem of having your proposal disqualified for failure to meet basic requirements. NASA has no obligation to evaluate proposals that do not meet all stated requirements.

Proposals will go through a competitive review process. Selection announcements will be made as listed with the "Important Program Dates" on Page 2. Selection notification will be made in writing to the institution President. Principal investigators will be notified by e-mail. The selection official for this solicitation is NASA's Associate Administrator for the Office of Equal Opportunity Programs.

PARTNERSHIP AWARDS FOR THE INTEGRATION OF RESEARCH INTO MATHEMATICS, SCIENCE, ENGINEERING & TECHNOLOGY UNDERGRADUATE EDUCATION (PAIR) NRA 00 OEOP-2A

PROGRAM DESCRIPTION

In an era when technological changes occur more rapidly than the four years it takes to produce an undergraduate, it is unlikely that a university education alone will be sufficient to adequately prepare an undergraduate for the rigors of graduate school or the world of work. This is especially true in the sciences and technical fields. Therefore, it is imperative that higher education integrate current and emerging research into its undergraduate curricula to better prepare its graduates to compete beyond the undergraduate level. Awards in this area are expected to facilitate the integration of inter-disciplinary MSET study into HBCUs and OMUs Mathematics, Science, Engineering, and Technology undergraduate education and to enhance undergraduate teaching and learning.

Goal

The **goal** of this program is to enhance collaboration among MSET academic departments, thereby strengthening the MSET baccalaureate degree-producing capacity of a number of the nation's HBCU's and OMU's by building upon previous NASA funding.

Objectives

The specific **objectives** are to:

- increase the production of U.S. students at HBCUs and OMUs who are competitively trained, have discipline-related work experience, and who attain advanced degrees in NASA-related fields;
- integrate cutting-edge science and technology concepts, practices, and teaching strategies into relevant areas of the undergraduate curriculum, including introductory-level courses and laboratories for majors and non-majors;
- create a PAIR Advisory Board that represents people who bring a wealth of working skills, and/or wisdom regarding various aspects of the projects activities;
- increase participation by faculty and students in projects that both foster collaborative inquiry, and that promote broad and significant improvements to undergraduate teaching and learning, especially of the techniques and methodologies associated with the conduct of research; and
- create model HBCU's and OMU's for the development of excellence in MSET academic infrastructure, undergraduate preparation, and student research training in a NASA-related discipline.

Outcomes

The **outcomes** of this award are:

- innovative interdisciplinary study among MSET academic programs that center on NASA-related course study, research, and technological applications, including collaborative efforts within MSET academic departments;
- more competitive undergraduate U.S. students, underrepresented in MSET fields who, because of

their research training and exposure to cutting-edge technologies, are better prepared to enter MSET graduate programs or MSET employment;

- enhanced undergraduate courses and curriculum including laboratory-based curricula that foster collaborative educational experiences between faculty members and students leading to institutional faculty development efforts; and
- model HBCU's and OMU's that integrate NASA-related research into the appropriate areas of the undergraduate curriculum that expose greater numbers of students and faculty to cutting-edge technologies.

PAIR ELIGIBILITY REQUIREMENTS

Institutions

In addition to the General Eligibility Requirements, PAIR applicants must also meet the following:

- (a) Offer an undergraduate degree in mathematics, science, engineering and/or technology, **and**
- (b) Have a demonstrated on-going scientific research program in an area relevant to one or more of NASA's four Strategic Enterprises (see Appendix B).

Institutions holding a National Science Foundation (NSF)/NASA Model Institutions of Excellence (MIE) Program, Collaborative to Integrate Research and Education (CIRE) or PAIR Awards, as of the release date of this announcement, **are not eligible** to receive a PAIR Award under this announcement.

Principal Investigator

The PAIR institution must designate a Principal Investigator (PI) and a Co-Principal Investigators (Co-PI). It is expected that the Principal Investigator represent the research aspect while the Co-Principal Investigator represents the administrative academic aspect. The Co-PI must be a member of the senior academic affairs management team and have significant influence at the institutional level to facilitate the integration of:

- Research into the MSET curriculum and
- PAIR faculty development "teaching and learning" strategies.

The PAIR institution, through its PI and Co-PI, must be responsible for the integration of research into the MSET curriculum, the development of courses and laboratories, the implementation of innovative faculty development workshops and seminars, the conduct of research training, the acquisition of equipment, the achievement of the planned goals and objectives and their contribution to the identified NASA Center/JPL Center of Excellence Area. The recipient must propose goals, objectives, and performance metrics against which to measure annual program outcomes.

Eligible and Ineligible Activities

Special effort is made to ensure that PAIR Award recipients are aware of eligible and ineligible activities prior to the merit review process. Eligible activities include, but are not limited to:

- Development of an interdisciplinary MSET academic program that supports NASA's education mission.
- Development of courses that incorporate interdisciplinary study into the MSET curriculum for MSET majors and non-majors.

- Build a significant capacity in the areas of excellence in interdisciplinary teaching and research training, for the purpose of curriculum innovations and enhancements.
- Support for development of a creative web-site presence that is an exemplary demonstration of the technical expertise of the projects themselves.
- Support for developing a comprehensive Student Outcomes Database that highlights recruitment strategies, retention percentages per class and major, graduation rate increases as a consequence of PAIR funding, strategies for increasing minority students in the MSET disciplines, and student accomplishments and achievements, among other items.
- Acquisition of laboratory instrumentation/equipment that will be used by undergraduate students to enhance the MSET instructional program.
- Development/improvement of laboratory-based curricula.
- Development of courses that incorporate research training into the MSET curriculum for MSET majors and non-majors.
- Development of courses that acquaint MSET majors and non-majors with the principles and methods of science, mathematics, engineering, and technology.
- Upgrading or replacing obsolete or unreliable equipment as long as the new equipment is essential to exposing students to the concepts and/or techniques directly related to the NASA research area and corresponding NASA Center of Excellence core area(s) of responsibility.
- Development of undergraduate honors program, student research, and/or independent study that will provide greater depth of understanding of MSET issues and concepts related to the NASA research area and corresponding NASA Center of Excellence core areas of responsibility.
- Access by students to undergraduate computer networks that provide greater instructional capabilities than are available locally.
- Any equipment purchase requirement must be identified with the delivery of a specified undergraduate course.
- Development or expansion of opportunities for undergraduate student research and design at appropriate locations (institutional, regional or national).
- Support for distance learning as part of a recruitment and retention strategy for students at 2-year institutions with whom the lead institution has a signed articulation agreement.

Ineligible activities include, but are not limited to:

- Instrumentation that does not relate to the development/improvement of laboratory-based curricula to be used by MSET undergraduate students to enhance the instructional program.
- Vehicles, laboratory furnishings or general utility items (e.g., office equipment, benches, tables, desks, chairs, storage cases, routine supplies, and general consumables).
- Maintenance equipment and maintenance and service contracts—even when these are for equipment procured through the PAIR award.
- Costs of construction or laboratory modification required for installation of the equipment (as distinct from simply integrating multiple computational equipment or interfacing computers to instruments).
- General replacement equipment.

PROJECT CONTENT AND DESIGN

Support will be provided for the systemic improvement of current MSET courses, including laboratory-based curricula, content, conduct, and the quality of undergraduate instruction. In addition, NASA will support the development of interdisciplinary and academic programs and courses, experiments and laboratory curricula for improving MSET undergraduate education and research training. **Only HBCU's and OMU's are eligible recipients of PAIR awards.**

Partnership with a NASA Center and/or JPL or with major institutions or industry with significant NASA assets is required. Proposals that demonstrate effective partnerships or cooperative arrangements among academia, government agencies, and industry are strongly encouraged. Consortium proposals that include TCU's are also strongly encouraged. U.S. Federal Government agencies that wish to participate will be expected to supply their own funding.

Other organizations that may participate as cooperating partners with a PAIR Institution include industry, other educational institutions, nonprofit organizations, other NASA Centers, JPL, and Federal, state, and local government agencies. *Relationships are strongly encouraged with hardware and support service contractors at specific NASA sites as well as Small and Disadvantaged Businesses working on NASA projects as a way of exposing greater numbers of HBCU/MI faculty and students to appropriate areas of the undergraduate curriculum and cutting-edge technologies.*

Proposals must clearly identify the current NASA research **and its relationship to a NASA Center or JPL Center of Excellence Area** (See *Appendix B*). Further, proposals must illustrate where and how its integration is appropriate within the MSET curriculum, and how its use will improve the undergraduate educational experience. The proposal must also specifically identify how these experiences will result in more competitively trained students, and what new skills these students will possess.

MINORITY UNIVERSITY MATHEMATICS, SCIENCE AND TECHNOLOGY AWARDS FOR TEACHER EDUCATION PROGRAM (MASTAP) NRA 00 OEOP-2B

PROGRAM DESCRIPTION

The proposal should be a collaborative effort between the Minority University and a school district with substantial enrollments of socially and economically and/or disabled students (hereafter referred to as disadvantaged students). The expected outcome from this collaborative effort is an increase in the number and percentage of state-certified Mathematics, Science, Engineering and Technology (MSET) teachers in schools with high percentages of disadvantaged students (hereafter referred to as hard to staff schools).

Goals

The goals of MASTAP are to:

- Increase the number of state-certified teachers in hard to staff middle and secondary schools with substantial enrollments of disadvantaged students by strengthening their technical skills and knowledge.
- Enhance teacher education curricula and thereby improve mathematics and science literacy among teachers serving disadvantaged middle and secondary schools students.
- Support the ability of the minority universities, through improved recruitment and retention methods, to increase the percentage of certified mathematics, science, and technology teachers who work in hard to staff schools.
- Create networks and support systems to retain MSET teachers working in hard to staff schools.

Objectives

The objectives of MASTAP are to:

- Improve teacher education curricula and thereby, pre-service teaching skills and experiences of undergraduates preparing for careers in teaching mathematics, science, and technology at the middle and secondary school levels in hard to staff schools.
- Enhance the pre-service curriculum to provide pedagogical models emphasizing: (1) team teaching in hard to staff middle and secondary schools with substantial numbers of disadvantaged students; (2) mathematics and science standards and assessment; (3) activities involving applications of critical thinking; and (4) culturally-sensitive approaches to teaching science and mathematics.
- Expand pre-service education students' knowledge of career opportunities as mathematics, science or technology teachers.
- Expand the teacher's ability to utilize NASA's instructional materials and other resources in the design, development, and delivery of state-approved mathematics, science, and technology curriculum.
- Disseminate information on successful strategies and models to other minority colleges and universities and to hard to staff middle and secondary schools.

Outcomes

The expected outcomes include:

- Increased numbers and percentage of state-certified mathematics, science or technology teachers in hard to staff middle and secondary schools.
- Increased number of state-certified MSET teachers employed in hard to staff middle and secondary schools.

Award Size and Duration

Each of the grant awards will provide a range from \$50,000 to \$200,000 annually for each of 3 years of support for a total of up to \$600,000. Continuation of funding for years two and three is predicated on documented progress reported annually and the availability of funds. Failure to make adequate progress in any one year will result in termination of the grant and continuation funding will not be provided. Further, continuation funding may be reduced if cost reporting indicates a significant level of unexpended funding.

MASTAP ELIGIBILITY REQUIREMENTS

Institutions

In addition to the General Eligibility Requirements, MASTAP institutions must also meet the following requirement:

- A four-year accredited minority university offering an undergraduate degree in education that leads to teacher certification.

A four year accredited minority university may partner with a Community College. The four-year minority institution will be the grantee. **Two-year education institutions and Community Colleges are not eligible to receive MASTAP Awards.**

Principal Investigator

The principal investigator must be a U.S. citizen, employed by the institution's teacher education department, and have demonstrated experience with the education of disadvantaged students in mathematics, science, and technology. PIs must devote at least 25 percent of their time to the project.

Principal investigators who hold MASTAP Awards, as of November 30, 1999, are not eligible to submit proposals for MASTAP (NRA 00 OEOP-2B) or PACE/MSET (NRA 00 OEOP-2C).

Participants

Pre-service teachers and non-certified in-service teachers receiving scholarships and/or stipends under this grant must be citizens of the United States. Participants, in programs funded by this grant, must be currently working in hard to staff schools or be willing to make a commitment to work in these schools, or be enrolled in the second year of a full-time teacher preparation program at an accredited U.S. college or university that meets the eligibility criteria outlined in Section II. The students selected must have and maintain a grade point average of 3.0 or higher and make a commitment to teach mathematics, science or technology in schools with substantial enrollments of disadvantaged students.

PROJECT CONTENT AND DESIGN

A project must be designed to embrace the teacher education curricula so as to address the under-representation of certified mathematics, science, and technology teachers in hard to staff middle and secondary schools. Projects must promote excellence and equity. The content must reflect the direction of national standards and/or state standards, as appropriate. The project should also be linked to emerging national, state and district frameworks and curriculum guidelines that are consistent with these standards.

Initiatives should include specific plans to team pre-service and non-certified in-service mathematics, science, and technology teachers working in hard to staff schools. Effective teaming activities should support and complement pre-service teacher preparation such as enhancement activities for pre-service teachers under the guidance of in-service teachers, and activities to facilitate the successful induction of new state-certified mathematics, science, and technology state-certified teachers into the classrooms of hard to staff schools. Establish networks and other strategies that will encourage the retention of MSET teachers.

The design must integrate NASA teacher education resource materials. An emphasis should be placed on connections between and within mathematics, science, and technology, as well as, on problem-solving activities and the use of hands-on experiences. The design should also reflect current research in teaching and learning that introduce innovative application of advanced technologies into education.

Diverse, innovative, and culturally sensitive projects with cohesive, collaborative strategies and specific outcomes are encouraged. The program is designed to produce measurable results such as an increase in the number and percentage of individuals applying for and passing the state's teacher certification program. Detailed data collection is required in all projects for monitoring and evaluation and reporting outcomes into the NASA database.

The project design should include a detailed description including the problems to be addressed and the project goals and objectives and how they relate to NASA's MASTAP and the institution's goals and objectives. Concretely describe the enhancements to be made to the teacher education curricula and the involvement of the mathematics, science, and technology departments in the projects. Outline in detail (per year) all project components and activities including the number of project participants and teacher certificates to be achieved during each of the three year period, and the strategies, curriculum, methodology and NASA resources to be used. Explain the role of in-service teachers serving elementary, middle and secondary schools with substantial enrollments of disadvantaged students and how they will be teamed with pre-service teachers.

The strength of relationships within the university and among its partners is essential. Provide evidence of the strength of the existing relationship between the university and the partnership school district(s) and between appropriate departments within the university. Describe the strengths and quality of the institutions and/or its partners pre-service teacher education program. Describe how the proposed training will contribute to increased entry and retention of pre-service and in-service non-certified mathematics, science, and technology teachers working in hard to staff schools. Explain how the training will increase the number of mathematics, science, and technology education degrees offered to disadvantaged students at the institution. Describe how it will increase the number of state-certified mathematics, science, and technology teachers who will become employed in hard to staff middle and secondary schools.

The management and administration of the project are vital to the success of the program. Provide a management plan that identifies key personnel and state the percentage of time they will devote to the planning, implementation and evaluation of the project. A specific description of the partnership between the teacher education department and the math, science, or technology discipline departments must be included as part of this management plan. Provide a timeline with milestones over the 3-year period. Indicate major activities. Identify the roles and responsibilities of personnel.

An important goal of the program is to increase the number of state-certified teachers in hard to staff middle and secondary schools. Provide evidence of demonstrated past experience in developing and managing pre-service teacher and non-certified in-service teacher education programs. Briefly describe the development and management process for such programs and include any outcomes or lessons learned from the past experiences. Also, include a synopsis of any past experience with teacher education curriculum enhancement programs to serve pre-service and in-service non-certified teachers. The number of participants served in those programs and their accomplishments are also required. Documentation on unique educational methods or materials developed from past experiences should also be included.

The project must include biographic information for key personnel (not to exceed 2 pages). Show the leadership of the principal investigator and the expertise of the management team. Include qualifications and experience in project management and mathematics, science, and technology education of disadvantaged students. Include a separate abridged list of individuals involved in the project, identifying department affiliation, discipline, and expertise.

PRECOLLEGE AWARDS FOR EXCELLENCE IN MATHEMATICS, SCIENCE, ENGINEERING, AND TECHNOLOGY (PACE/MSET)

NRA 00 OEOP-2C

PROGRAM DESCRIPTION

Historically, minorities have been underrepresented in mathematics, science, engineering, and technology professions. This program is expected to close the education gap in MSET fields at minority universities by encouraging the implementation of innovative projects with collaborative strategies to ultimately increase the pool of talented scientists and researchers in MSET fields. PACE is designed to include any combination of outreach projects such as Saturday Academies, Summer Science Camps, In-School Math and Science Academies, and After-School Enrichment Programs.

Goals

Focusing on public elementary, middle and high schools that primarily serve the target group, the goals of PACE are to:

- Increase the enrollment of students in MSET college preparatory courses.
- Strengthen students' MSET skills.
- Increase student enrollment in college in MSET disciplines.
- Encourage students to pursue MSET careers in the future.

Objectives

To achieve these goals, the objectives of the PACE program are to:

- Increase the number of targeted students successfully completing gateway courses, such as Algebra, Geometry, college preparatory mathematics and science.
- Communicate and collaborate among the mathematics, science, engineering, technology, and education departments within the university and between the university/non-profit organization and the public schools.
- Engage students in participatory activities, such as hands-on learning, research, use of advanced technology, peer support groups, and mentoring relationships with professionals and college students.
- Increase student awareness of MSET in the world, multicultural contributions to MSET fields, and career options through career exploration, counseling, and discussions of higher education options, requirements, and financial assistance.
- Inform parents of students' academic progress and involve them in orientation and awareness activities designed to strengthen family support of MSET education.
- Involve community groups, business, industry, research laboratories, museums, and educational and professional organizations through mentoring, field trips and guest speakers.

Outcomes

The expected outcomes include:

- Precollege students at each grade one through eight shall successfully progress to the next level of mathematics.
- High school students shall successfully progress through a college preparatory mathematics and science curriculum.
- Bridge students shall progress from freshman to sophomore level at rate greater than the university's overall retention rate for MSET students.

Award Size and Duration

PACE awards will be established under a grant with funding of \$100,000 annually for three years. Continuation of funding for years two and three is predicated on documented progress reported annually and the availability of funds. Failure to make adequate progress in any one year will result in termination of the grant and continuation funding will not be provided. Further, continuation funding may be reduced if cost reporting indicates a significant level of unexpended funding.

PACE ELIGIBILITY REQUIREMENTS

Institutions

Eligible minority institutions must partner with school districts and non-profit educational organizations serving disadvantaged students. The minority institution will be the grantee.

PACE targets disadvantaged students who are United States citizens at the pre-college levels. Economically disadvantaged students are those whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business who are not socially disadvantaged. Fifty percent or more of the students in the School District must receive free lunch.

Principal Investigator

Principal investigators who hold PACE/MSET Awards, as of November 30, 1999, are not eligible to submit proposals for MASTAP (NRA 00 OEOP-2B) or PACE/MSET (NRA 00 OEOP-2C).

PROJECT CONTENT AND DESIGN

Strong emphasis is placed on innovative projects with collaborative strategies and specific outcomes. PACE is designed to produce results that are defined by measurable and quantitative student-based outcomes. Detailed data collection is required in all projects for monitoring and evaluation. The number of students participating in the project should be stated in the proposal.

An outreach project must be designed to enrich and supplement the elementary and secondary school curriculum and address the under-representation of disadvantaged students in college preparatory mathematics, science and technology courses in public elementary, middle and/or high schools with substantial enrollments of these targeted students. Content must reflect the direction of curriculum standards as established in mathematics by the National Council of Teachers of Mathematics and in science as currently under development by the National Research Council. The project should be linked to emerging national, state, and district frameworks and curriculum guidelines that are consistent with these standards. Activities proposed should be a result of a careful needs analysis and should encompass NASA, school system, and university/non-profit goals.

The design should provide rigorous academic experiences that integrate NASA resource materials, connections among MSET disciplines, and multicultural contributions to MSET fields, hands-on experiences, inquiry learning, problem-solving activities, research, and advanced technology. As appropriate, it should address communication skills development both oral and written as they relate to mathematics and science. The design must provide opportunities for career exploration and counseling and include enrichment activities, such as field trips, guest speakers, interaction and/or mentoring with scientists and engineers, peer support groups, math and science fairs and competitions and mentoring and/or tutoring by college students. The design must involve parents and include activities that strengthen family support of MSET education.

Describe in detail the project design, scope, and disciplinary focus. Show how its goals and objectives relate to PACE goals and objectives, as well as to the university and participating partners goals and objectives. Outline in detail (per year) the breadth and depth of the project including all components and activities, the levels and disciplines targeted, resources, curriculum, methodology and NASA materials used, and intervention and follow-up strategies.

Describe how the project will address the specific needs of students in the targeted school(s), how these needs were determined, and how the project will increase the number and achievement of targeted students in college preparatory mathematics, science and technology courses.

Describe the proposed partnership plan. Provide evidence of the relationship between the university and participating partners and show strong linkages and collaboration among participating organizations.

Describe the roles and responsibilities of each partner. Signatures of participating partners should be included.

Indicate the roles and responsibilities of parents, mentors, career counselors, and MSET professionals.

Provide a management plan. Identify key personnel and state the percentage of time they will devote to the planning, implementation and evaluation of the project.

Clearly identify the leadership qualities, experience, and capabilities of the proposed principal investigator. Provide biographic information for the principal investigator. Include qualifications and experience in K-12 MSET education of targeted students.

The cost must not exceed \$100,000 per year. Show the commitment of resources consistent with the three-year budget request. Describe the strengths and quality of the departments of education, mathematics, science, engineering and technology and how they will contribute to and support the project.

APPENDICES

Appendix A -- GLOSSARY OF ACRONYMS AND DEFINITIONS

CIRE	Collaborative to Integrate Research and Education
Co-PI	Co-Principal Investigator
FACS	Financial and Contractual Status Report
HBCUs	Historically Black Colleges and Universities
HSIs	Hispanic Serving Institutions
JPL	Jet Propulsion Laboratory
MASTAP	Minority University Mathematics, Science and Technology Awards for Teacher Education Program
MI	Minority Institutions (refers collectively to HBCUs, HSIs, and TCUs)
MIE	Model Institutions of Excellence
MSET	Mathematics, Science, Engineering and Technology
MURED	NASA's Minority University Research and Education Division
NRA	NASA Research Announcement
NSF	National Science Foundation
OEOP	NASA's Office of Equal Opportunity Programs
OMUs	Other Minority Universities (refers collectively to HSIs and TCUs)
PACE/MSET	PreCollege Awards for Excellence in Mathematics, Science, Engineering, and Technology
PAIR	Partnership Awards for the Integration of Research into Mathematics, Science, Engineering & Technology Undergraduate Education
PI	Principal Investigator
TCUs	Tribal Colleges and Universities

Black, not of Hispanic origin: A person having origins in any of the black racial groups of Africa.

American Indian or Alaskan Native: A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

Hispanic: A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish Culture.

Pacific Islander: A person having origins in any of the original peoples of Hawaii; the US Pacific Territories of Guam, American Samoa, and the North American Marianas; the U.W. Trust Territory of Palau; the islands of Micronesia and Melanesia; and the Philippines.

White, not of Hispanic origin: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

Disabled: A person having a physical or mental impairment that substantially limits one or more major life activities; who has a record of such impairment or who is regarded as having such impairment.

Underrepresented minority students: Refers to students from racial and ethnic groups whose enrollment in MSET education or participation in MSET professions are much smaller than that group's representation in the general population. African Americans, Hispanics, and Native Americans currently fit this definition.

Hard to staff schools: Schools with a population of more than 50 percent underrepresented minority students and a high number and percentage of teachers who are not certified to teach mathematics, science, or technology.

APPENDIX B -- WORLD WIDE WEB ADDRESSES

1. NASA Strategic Plan World Wide Web address: <http://hq.nasa.gov/office/nsp>
2. Minority University Research and Education Division World Wide Web address: <http://mured.alliedtech.com>
3. NASA Center/JPL Center of Excellence and Mission Areas

Center	Designated Center of Excellence Area of Responsibility	Mission Area
Ames Research Center http://www.arc.nasa.gov/	Information Technology	Aviation Operations Systems and Astrobiology
Dryden Flight Research Center http://www.dfrc.nasa.gov	Atmospheric Flight Operations	Flight Research
Goddard Space Flight Center http://www.gsfc.nasa.gov/	Scientific Research	Earth Science and Physics and Astronomy
Jet Propulsion Laboratory http://www.jpl.nasa.gov/	Deep Space Systems	Planetary Science and Exploration
Johnson Space Center http://www.jsc.nasa.gov/	Human Operations in Space	Human Exploration and Astro Materials
Kennedy Space Center http://www.ksc.nasa.gov/	Launch and Payload Processing Systems	Space Launch
Langley Research Center http://www.larc.nasa.gov/	Structure and Materials	Airframe Systems and Atmospheric Science
Glenn Research Center http://www.grc.nasa.gov/	Turbomachinery	Aeropropulsion
Marshall Space Flight Center http://www.msfc.nasa.gov/	Space Propulsion	Transportation Systems Development and Microgravity
Stennis Space Center http://www.ssc.nasa.gov/	Rocket Propulsion Test	Propulsion Test

**APPENDIX C -- INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS
NASA SUPPLEMENTARY REGULATIONS**

(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 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) 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 and the NASA FAR Supplement. 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 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.

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.*

(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, such as, 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 NASA FAR Supplement Part 30 and the NASA FAR Supplement Part 1830 (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 that 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 proposals 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.
- (I) 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.

APPENDIX D -- REQUIRED FORMS

- D-1 Proposal Cover Page
- D-2 Certification of Institution and Principal Investigator Eligibility
- D-2a Certification of Co-Principal Investigator Eligibility
- D-3 Self-Identification of Handicap (optional)
- D-4 Certifications, Disclosures, and Assurances Pursuant to Lobbying, Debarment and Suspension, Nondiscrimination and Drug-Free Workplace
- D-5 Proposal Data
- D-6 Budget Page (Submit one for each year)
- D-7 Equipment List
- D-8 Proposal Abstract

FORM D-1 (PROPOSAL COVER PAGE)

**PLACE AN (X) IN THE APPROPRIATE SPACE TO DENOTE PROGRAM PROPOSAL
 NRA 00 OEOP-2-____(PAIR)____(MASTAP)____(PACE)**

This Box for NASA Use Only	
____ Proposal Number	____ Date Received
Name of Submitting Institution :	Congressional District:
Proposal Title:	
<p style="text-align: center;"><u>Certification of Compliance with Applicable Executive Orders and U.S. Code</u></p> <p>By submitting the proposal identified in this <i>Proposal Cover Page</i> in response to the NRA, the Authorizing Official of the proposing institution or the individual proposer hereby:</p> <ul style="list-style-type: none"> • 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 three Certifications contained in this NRA [namely, (I) <i>Certification Regarding Debarment, Suspension, and Other Responsibility Matters Primary Cover Transactions</i>, (ii) <i>Certification Regarding Lobbying</i>, and (iii) <i>Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs</i>]. <p>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).</p>	
Principal Investigator – Name	Authorized Institutional Official - Name
Title	Title
Department	Department
Mailing Address	Mailing Address
City State Zip	City State Zip
Telephone Number	Telephone Number
Fax Number	Fax Number
E-mail Address	E-mail Address
Principal Investigator – Signature	Authorized Institutional Official - Signature
Date	Date
____ Co-Principal Investigator – Name	

FORM D-2 (CERTIFICATION OF INSTITUTION AND PRINCIPAL INVESTIGATOR ELIGIBILITY)

Submit one copy of this form with the original proposal. Do not include this form with any of the other copies, as this may compromise the confidentiality of the information. Completion of this form is required.

I. Institutional Eligibility Certification

- 1. Institution Name _____
- 2. Proposal Title _____

- 3. Check each of the Department of Education Minority Institution Designation.
 Designated Hispanic-Serving Institution
 Designated Historically Black College or University
 Designated Tribal College or University

II. Principal Investigator Eligibility Certification

1. Last Name _____ First Name _____ MI _____

2. Verification of Employment:

Employed by (institution): _____

School/Department (specify): _____

Check type of position

Tenured Tenured-track Contractual

3. US Citizen Yes No (citizenship will be verified at award time)

Certification Authority

The person authorized to sign below certifies that the information provided is accurate.

Authorized Institutional Official (typed) _____

Title _____

Authorized Institutional Official Signature _____

FORM D-2a (CERTIFICATION OF CO-PRINCIPAL INVESTIGATOR ELIGIBILITY)

Submit one copy of this form with the original proposal. Do not include this form with any of the other copies, as this may compromise the confidentiality of the information. Completion of this form is required.

Co-Principal Investigator Eligibility Certification

1. Last Name: _____ First Name: _____ MI: _____

2. Verification of Employment:

Employed by (institution): _____

School/Department (specify): _____

Check type of position

___ Tenured ___ Tenured-track ___ Contractual

3. U.S. Citizen Yes No (citizenship will be verified at award time)

Certification Authority

The person authorized to sign below certifies that the information provided is accurate.

Authorized Institutional Official (typed) _____

Title _____

Authorized Institutional Official Signature _____

FORM D-3 (Standard Form 256)

FORM D-4 (CERTIFICATIONS, DISCLOSURES, AND ASSURANCES PURSUANT TO LOBBYING, DEBARMENT & SUSPENSION, NONDISCRIMINATION AND DRUG-FREE WORKPLACE)

A. LOBBYING

As required by Section 1352, Title 30 of the US 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.

B. 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.

B. 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 GIVES ASSURANCE THAT it will immediately take any measure necessary to effectuate this agreement. If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, and 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 below are authorized to sign on behalf of the Applicant.

FORM D-5 (PROPOSAL DATA)

1. NASA Center individual who has expressed specific interest in this proposal (optional)

- (a) Name _____
- (b) Center _____
- (c) Telephone _____

2. Budget Summary by Federal Government Fiscal Year

	YEAR 1	YEAR 2	YEAR 3
Requested NASA Funding			
Cost-Sharing (if applicable)			
Total Project Resources			

3. Indicate (a) Partnering Center/JPL, (b) Strategic Enterprise, (c) NASA Center/JPL Center of Excellence Area of Responsibility or research program or other activities, and (d) Proposal Category (**select only one from each of the categories**)

(a) Partnering Center/JPL (Optional)

(b) Strategic Enterprise

<input type="checkbox"/>	Goddard Space Flight Center	<input type="checkbox"/>	Johnson Space Center	<input type="checkbox"/>
<input type="checkbox"/>	Langley Research Center	<input type="checkbox"/>	Kennedy Space Center	<input type="checkbox"/>
<input type="checkbox"/>	Glenn Research Center	<input type="checkbox"/>	Marshall Space Flight Center	<input type="checkbox"/>
<input type="checkbox"/>	Ames Research Center	<input type="checkbox"/>	Stennis Space Center	<input type="checkbox"/>
<input type="checkbox"/>	Dryden Flight Research Center	<input type="checkbox"/>		<input type="checkbox"/>
<input type="checkbox"/>	Jet Propulsion Laboratory	<input type="checkbox"/>		<input type="checkbox"/>

<input type="checkbox"/>	Earth Science
<input type="checkbox"/>	Space Science
<input type="checkbox"/>	Aeronautics and Space Transportation Technology
<input type="checkbox"/>	Human Exploration and Development of Space
<input type="checkbox"/>	All NASA Enterprises
<input type="checkbox"/>	

(a) NASA Center/JPL Center of Excellence Area of Responsibility from Appendix B.

(a) Proposal Category -- Education

4. List the names of all partnering institutions and organizations.

FORM D-6 (BUDGET PAGE)

Institution Name _____
 Proposal Title _____

From _____ to _____

	RECIPIENT'S COST A	NASA USE ONLY	
		B	C
1. Direct Labor			
a. Salaries, wages	_____	_____	_____
b. 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 xxxxxxxxxx			
b. Amount used to reduce budget	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX
8. TOTAL ESTIMATED COST	_____	_____	XXXXXXXXXXXXXXXX
APPROVED BUDGET	XXXXXXXXXXXX	XXXXXXXXXXXX	_____

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.

GENERAL BUDGET INSTRUCTIONS

1. Direct Labor (salaries, wages, and fringe benefits): Attachments should list number and titles of personnel, amount of time to be devoted to the grant, and rates of pa.
2. Other Direct Costs:
 - (i) Subcontracts: Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.
 - (ii) 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 expense and indirect costs).
 - (iii) 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. Any equipment purchase requested to be made as a direct charge under this grant 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.
 - (iv) Supplies: Provide general categories of needed supplies, the method of acquisition, estimated cost.
 - (v) 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.
 - (vi) 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. Enter the student stipends (number of students x amount of stipend for each).
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 and 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 grants.
8. Total Estimated Costs: Enter the total after subtracting items 6 and 7b from item 5.

APPENDIX E (PAIR ONLY -- LIST OF NASA'S TOP 25 FUNDED INSTITUTIONS OF HIGHER EDUCATION AND CONTRACTORS)

1. Johns Hopkins University
2. Stanford University
3. University of Colorado, Boulder
4. University of Maryland at College Park
5. Massachusetts Institute of Technology
6. University of California Berkeley
7. New Mexico State University, Las Cruces
8. California Institute of Technology
9. University of Arizona
10. Wheeling Jesuit University
11. University of Alabama, Huntsville
12. Baylor College of Medicine
13. University of Alabama, Birmingham
14. Columbia University
15. University of Washington
16. University of California Los Angeles
17. University of Wisconsin, Madison
18. University of Hawaii
19. Utah State University
20. University of California, San Diego
21. Pennsylvania State University
22. University of Alaska Fairbanks
23. University of New Hampshire
24. University of Texas, Austin
25. University of Iowa

CONTRACTORS

- 1 Boeing Company
1. United Space Alliance LLC
2. Lockheed Martin Corporation
3. McDonnell Douglas Corporation
4. Thiokol Corporation
5. Allied Signal Technical Services
6. Boeing North American Inc.
7. Lockheed Martin Engineering and Science Company
8. TRW Inc.
9. Computer Sciences Corporation
10. EG&G Florida Inc.
11. Hughes Aircraft Co.
12. Lockheed Martin Aerospace Corp.
13. Hughes Information Tech. Corp.
14. United Technologies Corp.
15. Boeing Commercial Airplane Group
16. Science Applications International Corp.
17. Ball Aerospace & Technical Corp.
18. Johnson Controls World Services
19. General Electric Co.
20. U S B I Booster Production Co.
21. Orbital Sciences Corp.
22. I T T Corp.
23. Hamilton Standard Space Systems
24. Johnson Engineering Corp.