HUMAN RESOURCE DEVELOPMENT

FOR

SCIENCE, MATHEMATICS and ENGINEERING

EDUCATION and RESEARCH

Program Announcement and Guidelines

Division of Human Resource Development
Directorate For Education and Human Resources

Proposal Deadline: See Individual Program Descriptions

Precollege Focus

      o   Comprehensive Partnerships for Mathematics and Science Achievement

Undergraduate Focus

      o   Alliances for Minority Participation

Institutional Focus

      o   Centers of Research Excellence in Science and Technology

INQUIRIES

Questions not addressed in this publication may be directed to the HRD staff by contacting:

Division of Human Resource Development
Directorate for Education and Human Resources
National Science Foundation
4201 Wilson Boulevard
Room 815
Arlington, VA 22230
(703) 306-1640

The National Science Foundation (NSF) provides awards for research and education in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and projects and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for such findings or their interpretation.

The Foundation welcomes proposals on behalf of all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and research-related programs described in this document.

In accordance with Federal statutes and regulations and NSF policies, no person on the grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on an NSF project. See the program announcement or contact the program coordinator in the Directorate for Education and Human Resources. The telephone number is (703) 306-1636.

The Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD dial (703) 306-0090; for FIRS, 1-800-877-8339.

Copies of the Grant Proposal Guide and additional copies of this program announcement can be obtained electronically from STIS. (See inside back cover)

Principal investigators are encouraged to submit proposals via Fastlane. Access to Fastlane as well as directions for its use may be obtained through the NSF web site (http://www.nsf.gov).

PRIVACY ACT AND PUBLIC BURDEN

The information requested on the application materials is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be used and disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees; to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers, and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records" and NSF-51, 60 Federal Register 4449 (January 23, 1995). Reviewer/Proposal File and Associated Records 59 Federal Register 8031 (February 17, 1994).   Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to:

Gail A. McHenry
Reports Clearance Officer
Information Dissemination Branch
National Science Foundation, Suite 245
4201 Wilson Boulevard
Arlington, VA 22230

NSF does not normally support technical assistance, pilot plant efforts, research requiring security classification, the development of products for commercial marketing, or market research for a particular project or invention. Bioscience research with disease-related goals, including work on the etiology, diagnosis, or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support. However, research in bioengineering, with diagnosis or treatment-related goals, that applies engineering principles to problems in biology and medicine while advancing engineering knowledge is eligible for support. Bioengineering research to aid persons with disabilities is also eligible. Catalog of Federal Domestic Assistance Number 47.076

Program Announcement and Guidelines

Table of Contents

INTRODUCTION

The role of science and technology in American society is undergoing dramatic change. In an increasingly technology-oriented society, a basic understanding of science and mathematics is essential not only for those who pursue careers in scientific and technical fields but for all people. At present, however, not all students have access to quality instruction in these areas, and most adults have limited opportunities to develop a better understanding of the role of science. This nation needs a population that is well prepared to fulfill the needs of a technically competent work force and that exercises their full rights and responsibilities of citizenship in a modern democracy.

ROLE of NSF in EDUCATION

The National Science Foundation's (NSF) mandate to ensure the vitality of the U.S. in the scientific and technical enterprise includes responsibility for the quality, quantity, composition, distribution, and effectiveness of the human resource base in science and engineering. This includes providing leadership and support for the nation's efforts to improve both science, mathematics, engineering, and technology (SMET) education and general scientific and mathematical literacy. By bringing together the best minds from the educational, scientific, engineering, communications, and business communities, NSF supports programs that are designed to improve the quality of SMET education at all levels. Through these efforts, NSF also seeks to implement effective programs that impact the greatest number of people, both students and the general public.

NSF is committed to providing strong and continuing leadership in SMET **education**. Specifically, NSF's education mission includes:

o..........precollege SMET education;

o..........undergraduate SMET education;

o..........institutional development;

o..........maintenance of the SMET personnel essential to the nation's research capabilities; and

o..........**promoting scientific literacy**

o..........other components of the SMET system of preparation, including broadening participation of institutions.

The Foundation has a particular interest in improving the quality of, and access to, SMET education and research of motivated and talented students in scientific and technical fields of study. For in the years ahead, this cadre of students will comprise a growing proportion of the pool of U.S. students from which a highly skilled workforce will be drawn. To help meet future demands for qualified scientists and engineers, our Nation must be more effective in attracting and advancing more students through the SMET pipeline.

The Foundation's mission requires comprehensive approaches to address recruitment, enrollment and retention of all students in the SMET education. Strong emphasis is placed on projects with cohesive, collaborative strategies and specific outcomes. The programs described in this document are also designed to increase student enrollment and retention, and to produce measurable results. Detailed data collection is required in all projects, for monitoring and evaluation of progress.

DIRECTORATE for EDUCATION and HUMAN RESOURCES

Primary responsibility for NSF's educational activities is assumed by the Directorate for Education and Human Resources (EHR). The programs supported by EHR represent a continuum of activities covering student, teacher, and faculty development and improved public science literacy. These programs provide for upgrading educational materials and equipment and for new approaches to education.

Below is a brief outline of the activities supported under each division or office:

o..........The **Division of Elementary, Secondary, and Informal Science Education (ESIE)** supports activities designed to develop, improve, and disseminate effective instructional materials and pedagogy in both informal arenas and classroom settings and to improve the qualifications and effectiveness of SMET elementary and secondary school teachers.

o..........The **Division of Undergraduate Education (DUE)** focuses on improvement in undergraduate education in two-year and four-year colleges and universities; it manages undergraduate education programs of its own and coordinates the undergraduate education activities supported by the NSF research directorates.

o..........The **Division of Graduate Education (DGE)** manages graduate and postdoctoral programs.

o..........The **Division of Research, Evaluation, and Communications (REC)** serves all EHR units engaged in educational programs by conducting research, development and experimentation on learning technologies; conducting analytic and evaluative studies and research on SMET education at all levels; and supporting project monitoring systems and program evaluation.

o..........The **Division of Educational System Reform (ESR)** manages and operates broad-based initiatives to stimulate systemic reform in precollege SMET education nation-wide at state, urban, and rural levels.

o..........The **Division of Human Resource Development (HRD)** supports student enrichment, teacher development, curriculum expansion, and research-oriented and training activities designed to increase the participation and achievement of underrepresented groups and institutions at every level of SMET education and research.

o..........The **Office of Experimental Program to Stimulate Competitive Research (EPSCoR)** supports the development of research capability in states and institutions that receive relatively little Federal R&D funding.

DIVISION of HUMAN RESOURCE DEVELOPMENT

The Division of Human Resource Development (HRD) has primary responsibility for broadening participation of all individuals in science and engineering. The activities reflect NSF's growing commitment for developing the resources of the scientific and technological community as a whole and insuring an adequately trained research and development workforce in the next decade.

To meet the challenges presented by the Nation's accelerating needs in science and technology, HRD is strengthening its consolidated thrust to increase the motivation and desire of students to consider careers in SMET fields. This thrust focuses increasingly on more comprehensive and regional initiatives. The objectives of HRD are:

- to increase the participation of all students, especially minorities, women and girls, and persons with disabilities in SMET at all educational levels; and

- to strengthen the research and education capabilities of minority academic institutions.

The programs described in this document are designed to address the challenges of increasing the number of students as full participants in the mainstream of SMET disciplines. HRD programs focus on the continuum of precollege, undergraduate, and graduate opportunities for individuals. These programs maximize the potential for making a significant, positive impact on the equitable inclusion of all U.S. students over the next decade.

Proposers are being called upon to design disciplinary or multi-disciplinary strategies for increasing the quantity and quality of U.S. students choosing appropriate precollege and undergraduate curricula; earning SMET baccalaureate degrees; pursuing advanced SMET study; taking SMET graduate degrees; and entering SMET careers, especially K-12 teaching and postsecondary faculty positions. To accomplish these objectives, the knowledge, resources, and capabilities of a broad range of organizations within the SMET community must be tapped. HRD encourages formation of networks (coalitions, alliances, or partnerships) among scientists and science educators throughout academia, government, industry, and community-based organizations.

Synopses of the programs and initiatives described in this document are presented below:

Precollege Focus

- **Comprehensive Partnerships for Mathematics and Science Achievement** (CPMSA) This Program supports educational systemic reform in cities that are not eligible to participate in the Urban Systemic Initiatives (USI) program and in cities that have not received a Local Systemic Change (LSC) program award. City school systems, which are the units of change, are expected to link with institutions of higher education, community-based and other educational organizations in the design and implementation of a combination of in-school student and teacher enhancement activities, as well as informal education efforts. The goals are to improve student achievement in mathematics and science courses; enhance teacher knowledge and skills; and expand student interest in science, mathematics, and technology as career choices.

Contact CPMSA: Phone (703) 306-1633.
Anticipated number of new awards: Approximately 5
   Proposal submission deadline: October 15

Undergraduate Focus

- **Alliances for Minority Participation** (AMP) Program supports the establishment of multidisciplinary approaches at the undergraduate level to increase the quality and quantity of students in science and engineering fields, including minority students and others that are currently underserved in science and engineering fields as documented by results of national achievement and participation indicators.
Contact AMP: Phone (703) 306-1632.
Anticipated number of new awards: Approximately 5
    Proposal submission deadline: October 15

Institutional Focus

- **Centers of Research Excellence in Science and Technology** (CREST) Program supports the enhancement of research and education activities at the most productive minority institutions.
Contact CREST: Phone (703) 306-1634.
Anticipated number of new awards: 4
    Proposal submission deadline: December 1

FEDERAL GOVERNMENT INTERAGENCY SCIENCE EDUCATION COLLABORATION

Two agencies of the Federal Government, the National Science Foundation (NSF) and the National Institutes of Health (NIH), have primary responsibility for supporting education of the Nation's cadre of scientific talent-- NSF through science, mathematics, engineering and technology (SMET) education programs and NIH principally through biomedical training initiatives. Both agencies are committed to increasing the number of students in scientific and technical professions by appropriately training them and stimulating their interest in pursuing careers in these fields. Toward that end, both NIH and NSF recognize the need to intervene at all educational levels (i.e. middle school, high school, undergraduate, graduate and postgraduate levels) as well as the mutual benefit of combining their resources to offer programs that are consistent with their respective missions.

One of NSF's existing programs provides a unique opportunity for NIH/NSF collaboration, at the precollege level: the **Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA) Program.** Through a Memorandum of Understanding (MOU) between the two agencies **[National Institutes of Health and The National Science Foundation Memorandum of Understanding, June 10, 1992]**, existing **CPMSA** projects, with support from NIH, will be expanded to offer health-related activities at the middle school through high school levels. Under the agreement, specific projects in fields related to biomedical sciences (e.g. biology, chemistry, genetics) can be incorporated into the programmatic elements of the **CPMSA** program. However, since **CPMSA** is a precollege program, discipline focus for these projects would not change under the MOU. Moreover, it is not the intent of this collaboration to support education and training activities targeted exclusively to health professions.

Applicants submitting proposed projects under this arrangement must adhere to the established guidelines of the CPMSA program. New awards and the continuation of awards will be contingent upon the availability of funds and acceptable progress in meeting program objectives, including monitoring and evaluation activities, as determined by program staff.

GENERAL PROGRAM INFORMATION

PREPARATION AND SUBMISSION OF PROPOSALS

Proposals submitted in response to this document should be prepared and submitted in accordance with the guidelines provided in the NSF brochure, *Grant Proposal Guide*, (NSF 98-2). Single copies of this brochure are available at no cost from the NSF Clearinghouse (301) 947-2722, or via e-mail (Internet:pubs@nsf.gov).

All HRD proposals described in this document must contain the following sections which are described fully in the Grant Proposal Guide.

- *Supplementary Information on Principal Investigators* (NSF Form 1225)

- *Proposal Cover Sheet* (NSF Form 1207, revised 7/95)

- *Table of Contents*

- *Project Summary*

- *Detailed Budget* (NSF Form 1030)

- *Budget Explanation*

- *Project Description* (See individual programs for a more detailed explanation.)

- *Biographical Sketches*

- *Current and Pending Support* (NSF Form 1239)

- *Results from Prior NSF Support*

In addition to the standard sections listed above, all proposals must contain a *Human Resource Development Project Summary Data Worksheet*, NSF Form 1325 (see Appendix A).

Project Description may not exceed fifteen (15) pages. The fifteen page limit will be enforced by NSF. The proposal must be prepared using a letter quality printer with a typeface or font giving no more than 12 point type. Each copy of the proposal should be on standard size paper and stapled only in the upper left corner. All pages must be numbered at the bottom with 2.5 cm. margins at the top, bottom, and on each side. All material submitted to the Foundation must be contained in a single package. Secure packaging is essential. The Foundation is not responsible for the processing of proposals damaged in transit.

PROPOSAL BUDGET PAGE FORMAT

The budget page format that is provided in this Program Announcement and Guidelines (see Appendix B) should be used in all proposal submissions to the HRD Division. This budget form contains three (3) columns; a column for funds requested from NSF, a column for non-federal matching funds ("Grantee Contribution" or cost sharing) and a column for total project costs.

The Program Acronym (CPMSA, AMP or CREST) which corresponds to the program or activity of the proposal **must** be clearly listed on the mailing label and on the cover sheet. Fifteen (15) copies of each proposal, including one copy bearing original signatures, should be mailed to:

Proposal Processing Unit - Room P60
Attention: EHR/HRD - *Program Acronym (CMPSA, AMP, or CREST)*
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

Only one (1) copy of NSF Form 1225, attached to the original signed proposal, should be sent.

PROPOSAL REVIEW

Proposals submitted in response to this program announcement will be subject to the NEW merit review criteria approved by the National Science Board on March 28, 1997 (NSB97-27). For additional information on NSF's new merit criteria, see the Merit Review Task Force Final Report on the NSF Home Page at http://www.nsf.gov/cgi-bin/getpub/nsbmr975. The new merit review criteria are:

What is the intellectual merit and quality of the proposed activity?

The following are suggested questions that the reviewer will consider in assessing how well the proposal meets this criterion. Each reviewer will address only those questions which he/she considers relevant to the proposal and for which he/she is qualified to make judgments.

> **How important is the proposed activity to advancing knowledge and understanding within its own field and across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?**

What are the broader impacts of the proposed activity?

The following are suggested questions that the reviewer will consider in assessing how well the proposal meets this criterion. Each reviewer will address only those questions which he/she considers relevant to the proposal and for which he/she is qualified to make judgments.

> **How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?**

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed to the PI/PD by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

Proposals will be reviewed, as appropriate, by experts selected from the SMET research and education community. Special efforts will be made to secure reviews from individuals with strong records of achievement in working with the target audience. Final award determination will be made by program staff and will reflect both reviewer comments and program priorities.

Specific programs may have additional evaluation criteria. See PROPOSAL REVIEW AND EVALUATION under individual programs for additional information on proposal evaluation criteria.

Review and processing of proposals require approximately six months.

PROGRAM EVALUATION AND ASSESSMENT

In addition, the EHR Directorate's Division of Research, Evaluation, and Communication is developing a framework to facilitate the on-going evaluation of all directorate programs. Division staff will consult with all grantees at the time of award regarding the coordination of project evaluation activities with those of the Directorate. The cooperation of project directors will be an important factor in assuring the success of this effort.

PROJECT EVALUATION AND ASSESSMENT

Each proposed project must include a methodologically sound and realistic evaluation plan that states the objectives or critical evaluation questions, the personnel needed to perform the evaluation tasks, what processes will be used to collect and analyze the information, and a time line for these activities. Evaluation activities must take place at least annually. The evaluation section of the proposal must describe how the information collected and analyzed will be used for monitoring the progress of the project (e.g., databases, annual report) and for providing evaluation information. The proposed budget explanation should clearly identify the costs of evaluation and monitoring activities.

AWARD ADMINISTRATION

Awards made as a result of this document are administered in accordance with the terms and conditions of NSF GC-1, "Grant General Conditions," FDP-III, "Federal Demonstration Partnership General Terms and Conditions," depending on the grantee organization, or "Cooperative Agreement General Terms and Conditions." Copies of these documents are available at no cost from the NSF clearinghouse (301) 947-2722, or via e-mail (Internet: pubs@nsf.gov). More comprehensive information is contained in the NSF *Grant Policy Manual* [NSF 95-26 (7/95)], for sale through the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The telephone number at GPO is (202) 783-3238 for subscription information.

COMPREHENSIVE PARTNERSHIPS for MATHEMATICS AND SCIENCE ACHIEVEMENT (CPMSA)

Submission Deadlines: Proposals must be received by October 15

I. INTRODUCTION

The Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA) Program, formerly known as The Comprehensive Partnerships for Minority Student Achievement Program, was established to enhance the achievement of precollege students in participating city school districts. This program strives to improve the quality and quantity of science and mathematics education delivered by entire school districts or systems. Furthermore, a significant portion of the potential pool of scientific and technological expertise is lost unless all talented students are challenged to succeed in science, mathematics, engineering, and technology (SMET). Recognizing that currently only a small percentage of precollege students pursue careers in SMET, this program ultimately should focus on students who have not previously shown much interest in science, but who might become involved and successful if properly motivated and encouraged to do so.

Building on NSF's strategy of forging alliances and partnerships for systemic reform, city school systems will be required to link to institutions of higher education, business and industry, professional organizations, community-based organizations, and other educational organizations to facilitate the attainment of program objectives. This activity is intended to: (1) increase the precollege enrollment and successful completion of science and mathematics courses by students in awardee districts; (2) require the participation of the school system as the lead unit of change; (3) provide support for an integrated, systemic approach to enhancing all major components of the educational system; and (4) actively identify successful models in the public and private sector and support their replication.

CPMSA projects are intended to engage full participation of teachers, principals, and other administrators who are responsible for implementing precollege science and mathematics education reform. These persons must be involved in defining the challenges in science, engineering, and mathematics education reform, in designing and implementing appropriate reform strategies, and, more importantly, in providing a sense of ownership and accountability for the success of the SMET education reform project.

II. GOALS AND OBJECTIVES

The primary goal of the CPMSA Program is to develop systemic approaches to *increase the number of students enrolling in and successfully completing precollege courses which will prepare them to pursue undergraduate programs in the sciences, engineering and mathematics.* The increase in the number of well-prepared high school graduates will contribute to the national agenda to increase the number of students receiving B.S. degrees in natural sciences and engineering academic disciplines. In order to achieve CPMSA goals, the current graduation rate of well-prepared SMET high school "college track" graduates must be substantially increased, and usually doubled over five years for each project.

The projects, in order to be cost effective, should be focused on city school districts with large numbers of students and must be developed through partnerships among several public and private organizations and community groups in the region. It is essential that city school districts be the primary participants in the partnerships. The Foundation believes that significant involvement in and support of project activities by business and industry are critical since, it is from those arenas that students can gain a better understanding of career opportunities available in SMET. Projects should be comprehensive in their coverage of SMET, in their focus on the spectrum of educational levels from elementary through high school, and in their emphasis on interaction among cooperating organizations and groups. The objectives of CPMSA are to:

- implement a district-wide standards-based mathematics and science curriculum and develop appropriate enrichment activities in the elementary and secondary schools with a substantial number of students to improve the quality of precollege science and mathematics education;

- develop and strengthen the capacity to deliver standards-based quality instruction in school science and mathematics education for students that will result in a significant increase in the number who are academically prepared to enter college and major in the sciences, mathematics, or engineering;

- **develop and sustain district-wide policies that will significantly increase student enrollments and successful completion of "gatekeeping" courses, such as algebra in the eighth and ninth grades; all district graduation requirements shall include the completion of algebra by the ninth grade.**

- substantially decrease or eliminate academic tracking, improve academic counseling, and facilitate the successful transitions of students from elementary to middle school, from middle school to high school, and from high school into undergraduate programs in SMET;

- stimulate efforts among secondary schools and colleges and universities, as well as relevant informal science organizations (e.g. museums, aquaria, etc.), in the region to develop summer enrichment activities;

- stimulate efforts among professional organizations, business and industry to become involved in mentorship programs for precollege students to motivate them to succeed in challenging science and mathematics courses;

- coordinate the partners involved in the various NSF-supported programs, as well as precollege programs supported by other Federal agencies and private sector organizations, to avoid duplication, and to share resources to maximize the available funding;

- develop outreach programs to involve parents and guardians of students, (especially those students who are currently high achievers in the system) to inform them of national and state standards.

- function in a complementary and collaborative way with other related NSF-funded educational activities within the region such as the Statewide Systemic Initiatives (SSI) and the Alliances for Minority Participation (AMP).

In order to accomplish these objectives, it is important that school superintendents, principals, counselors, and teachers collaborate to design, implement, and support the proposed reforms and agree on the overall plan and especially the strategies proposed to ensure the achievement of specific quantitative outcomes.

The implementation of the specific strategies needed to bring about these systemic outcomes may require significant changes in the school "culture" with respect to attitudes and behaviors and how instructional reform in science and mathematics is accomplished, and to develop the full academic potential of all students.

III. ELIGIBILITY

There are two categories of eligibility for CPMSA: submitting organization and discipline focus. Proposals must meet the requirements in both categories as discussed below:

Submitting Organizations - Proposals shall be submitted by city school systems enrolling at least 20,000 students that: (a) have large numbers of school age children (ages 5-17) living in economic poverty, as determined by the 1990 census; (b) are not eligible to participate in the Urban Systemic Initiatives (USI) program; and (c) have not received a Local Systemic Change (LSC) program award under the NSF Teacher Enhancement (TE) program. All proposals shall come from the office of the superintendent or other official who is designated as the chief school officer. *Although partnerships with colleges and universities are strongly encouraged, and university personnel may serve as the co-principal investigator(s) on a project, a college or university may not serve as the fiscal agent or grantee for the CPMSA project.*

City school systems are encouraged to allow proposals from individual schools to be incorporated into a more comprehensive effort. Regardless of the process used to design a proposal, all those who have a responsibility to the identified city school system, especially classroom teachers, principals, science and mathematics supervisors, should be meaningfully represented in the planning and implementation of the proposed effort.

Discipline Focus - Science and mathematics education must be the primary focus of proposed efforts. Activities which enhance performance in these subjects, e.g., writing skills and computer literacy, may be included as appropriate.

Other Support - City school systems which already have significant support from NSF, excluding LSC and USI projects, and other public and private sector sources are not precluded from this competition; however, the focus for the CPMSA proposal must be clearly different from activities currently being supported by NSF (i.e., the value added by the CPMSA must be evident).

It also should be noted that this activity will not provide funds to replace money which is available from non-NSF sources. In effect, this program is intended to build on current activities or initiate new activities which will ultimately provide the impetus for a larger scale effort.

There will be approximately five awards made under this solicitation, and some components of a proposal which are not funded may be eligible for support under other NSF Education and Human Resource Development programs.

IV. PROJECT DESIGN

The Foundation intends to allow maximum flexibility in the design of efforts to address specific elements of science and mathematics education, as long as the goals and objectives of the CPMSA program are achieved. In addition, NSF actively seeks innovative approaches to increase the enrollment of students and their successful completion of "gate keeping" courses in mathematics and science, as well as new approaches to strengthen student achievement and instructional practice.

A project under this program should cover the entire precollege science and mathematics education pipeline. While some consideration will be given to efforts which are restricted to a part of the educational continuum or to one discipline, **priority** will be given to proposals which seek to systematically and comprehensively increase the number of precollege students in the SMET system and influence the quality of mathematics and science education from grades K-12. The overall project design should provide the necessary framework, supporting mechanisms and intervention strategies that will increase the successful movement of a substantially larger number of students through each phase of the precollege SMET educational system.

Eligible Activities - Activities shall be based on the implementation of national/state standards-based curriculum, instruction, and assessment of science and mathematics education and their effects on classroom learning and teaching throughout the school district. These activities shall be managed through an effective dissemination and monitoring mechanism within the existing district infrastructure. Activities may include any combination of standards-based formal (in-school) enrichment, and informal education efforts which are focused on improving the performance of students and teachers and which lead to a significant increase in the enrollment of students and their successful completion of SMET courses, including "gatekeeping" courses such as algebra and geometry. The participation of local institutions of higher education, parents, families, relevant community-based organizations and other educational organizations that serve to facilitate the program's objectives is expected as appropriate. All activities shall be driven through the leadership, vision, and governance of the office of the district superintendent.

In general, the program shall be a well designed, coordinated set of activities that is based on national standards, and should contain discrete elements that can be replicated in other school systems The source of this coordination must be the office of the superintendent, to insure alignment with new district policy frameworks that may, for example increase graduation requirements in science and mathematics. These coordinated efforts may initially target one or more clusters of students, or may directly impact the entire system throughout the life of the program. If the academic achievement of one cluster of students is the initial goal of the project, then applicants should consider how this effort, if expanded, could influence the entire K-12 educational system by the end of a five-year award. In line with this framework, proposed activities should include both immediate and long-term efforts that may be continued when the CPMSA project has been completed. Positive outcomes of all activities shall be sustained by the submitting organization after project funding has ended.

Project emphasis must be placed on classroom-based educational activities. However, examples of specific activities that may be suitable for CPMSA projects may include but are not limited to the following:

- **curriculum reform** - restructuring the curriculum and/or course of study, expanded course offerings, revision of course content, instructional strategies, staffing patterns, hours, etc., (so as to align with mathematics standards developed by National Council of Teachers of Mathematics (NCTM) and science standards developed by the National Research Council (NRC)).

- **curriculum enhancement** - pre-algebra and algebra enrichment, hands-on mathematics and science activities as well as tutorial programs, parental support groups, and math and science clubs.

- **teacher enhancement** - the expansion/upgrading of teacher skills and knowledge of disciplinary concepts and processes and pedagogy, with emphasis on implementing effective methods, including nationally recognized instructional materials, for teaching science and mathematics to students in the district.

- **assessment** - the implementation of standards-based assessment programs to inform the district of its progress in implementing instructional and learning outcomes in science and mathematics reform.

- **strategic use of resources** - coordinated use of current Federal, local, state, and private resources to leverage CPMSA goals and objectives, as well as the provision or upgrading of curriculum-related materials, supplies, and laboratory instrumentation (The integration of computer technology in classroom and laboratory settings in the context of mathematics and science standards is strongly encouraged).

- **student enrichment activities** - Saturday academies, after-school programs, industry-based mentorship programs and science fairs. These appropriate activities should emphasize *team building principles* (e.g., collaborative learning experiences, small group clustering in academic sections, structured work-study groups) and *individual skill development* (e.g., participation in special seminars and colloquia).

- **summer enrichment activities** - these include industry-based mentorship programs, residential and non-residential summer camps, career counseling and other activities designed to enhance standards-based student research experiences and student/mentor interactions.

These examples illustrate the possible scope of project activities. Whatever activities are proposed should be the result of a careful needs analysis, encompass both school system and NSF goals, and have the potential to result in a substantial and measurable increase in the number of precollege high school students in the SMET system and a significant increase in the number of high school graduates who are academically prepared to enter college and major in SMET disciplines.

All activities put forth in the proposals will be viewed by NSF in light of their potential for substantially increasing the number of high school graduates who will be able to enroll in undergraduate programs in SMET. *A successful CPMSA program is one that results in a quantifiable and long-term change in the number of students who enroll in and complete the "college preparatory SMET courses in secondary schools."*

Staff - Project staffing requirements will depend on the design, scope and the discipline focus. Staff should include school district administrators, teaching and counseling personnel and faculty from local institutions of higher education. *To assure the school system's commitment to the project, the principal investigator must be the chief administrator of the targeted city school system.* This person should have an active role in policy and budgetary decisions; the implementation, monitoring and evaluation of project activities; and the assessment of student achievement. The proposal also should include plans, endorsed by the office of the superintendent or chief school officer, to continue project activities after NSF funding has ended and certification that the NSF funds will not replace extant financial resources.

Advisory Committee - Projects must establish an advisory committee which will guide the implementation and assessment of project activities. The size of the committee is left to the discretion of the applicants. However, there should be adequate representation from all groups that have responsibility for the design and implementation of the educational program in the system, including teachers and school system administrators, leaders of parent and community-based educational organizations, practicing engineers, and scientists and representatives from local business, industry, institutions of higher education, especially science and mathematics educators. Prospective candidates for the committee must be identified in the proposal. The superintendent or chief school officer must be a member of this committee.

Project Length - Projects will be funded up to five years and should be designed to produce measurable improvement in student participation and achievement in mathematics and science courses by the end of that duration. Results bearing on student enrollment and performance in mathematics and science will be required on an annual basis. In support of the total time-frame, the proposal must include a detailed management plan covering the entire duration of the project which describes major tasks, milestones and the responsibilities of each participating organization. Project activities should begin in the first school term following award notification.

Participants - Proposed efforts should address both student and teacher performance in SMET classes. Parents, families, and other school personnel can also receive services designed to facilitate their interaction with and support of these two groups.

- **student enrichment activities** - Saturday academies, after-school programs, industry-based mentorship programs and science fairs. These appropriate activities should emphasize *team building principles* (e.g., collaborative learning experiences, small group clustering in academic sections, structured work-study groups) and *individual skill development* (e.g., participation in special seminars and colloquia).

- **summer enrichment activities** - these include industry-based mentorship programs, residential and non-residential summer camps, career counseling and other activities designed to enhance standards-based student research experiences and student/mentor interactions.

These examples illustrate the possible scope of project activities. Whatever activities are proposed should be the result of a careful needs analysis, encompass both school system and NSF goals, and have the potential to result in a substantial and measurable increase in the number of precollege high school students in the SMET system and a significant increase in the number of high school graduates who are academically prepared to enter college and major in SMET disciplines.

All activities put forth in the proposals will be viewed by NSF in light of their potential for substantially increasing the number of high school graduates who will be able to enroll in undergraduate programs in SMET. *A successful CPMSA program is one that results in a quantifiable and long-term change in the number of students who enroll in and complete the "college preparatory SMET courses in secondary schools."*

Staff - Project staffing requirements will depend on the design, scope and the discipline focus. Staff should include school district administrators, teaching and counseling personnel and faculty from local institutions of higher education. *To assure the school system's commitment to the project, the principal investigator must be the chief administrator of the targeted city school system.* This person should have an active role in policy and budgetary decisions; the implementation, monitoring and evaluation of project activities; and the assessment of student achievement. The proposal also should include plans, endorsed by the office of the superintendent or chief school officer, to continue project activities after NSF funding has ended and certification that the NSF funds will not replace extant financial resources.

Advisory Committee - Projects must establish an advisory committee which will guide the implementation and assessment of project activities. The size of the committee is left to the discretion of the applicants. However, there should be adequate representation from all groups that have responsibility for the design and implementation of the educational program in the system, including teachers and school system administrators, leaders of parent and community-based educational organizations, practicing engineers, and scientists and representatives from local business, industry, institutions of higher education, especially science and mathematics educators. Prospective candidates for the committee must be identified in the proposal. The superintendent or chief school officer must be a member of this committee.

Project Length - Projects will be funded up to five years and should be designed to produce measurable improvement in student participation and achievement in mathematics and science courses by the end of that duration. Results bearing on student enrollment and performance in mathematics and science will be required on an annual basis. In support of the total time-frame, the proposal must include a detailed management plan covering the entire duration of the project which describes major tasks, milestones and the responsibilities of each participating organization. Project activities should begin in the first school term following award notification.

Participants - Proposed efforts should address both student and teacher performance in SMET classes. Parents, families, and other school personnel can also receive services designed to facilitate their interaction with and support of these two groups.

Project Size - The overall program philosophy is to strengthen the mathematics and science achievement of as many students as possible. Ideally, projects should seek to influence the entire city school system. Applicants should clearly state the size and demographics of the student and teacher populations which will benefit from project activities. The scope of the project should be clearly defined within the context of the entire system.

V. PROPOSAL PREPARATION and SUBMISSION
(See General Program Information section of this document for additional requirements.)

The Project Description is limited to **15 pages**. There is no limit on the length of the appendices. However, applicants should be judicious in this regard as NSF leaves to individual reviewer discretion what part of the appendices, if any, should be read.

The Project Description must address **each** of the following areas (in the order given) in sufficient detail to allow the proposal to be evaluated in accordance with the goals of this program:

- **City Demographics** (including the social and economic environment)

- **School System Demographics** (a description of the science/mathematics curriculum; student and teacher characteristics; available equipment and resources) - enrollments/successful completion data on students taking algebra at the eighth and ninth grades, as well as enrollment of students in other SMET courses at the secondary level; the students' graduation data for those who have completed courses through pre-calculus with at least three years of science courses

- **Statement of the Problem**(s) to be addressed

- **Project Design**

  -Project scope (size/length)
  -Disciplinary focus
  -Participant characteristics (students/teachers)
  -Intervention strategies and proposed activities
  -Project monitoring, assessment and dissemination plan

- **Project Staff and Advisory Committee**

- **Participating Organizations** and Their Responsibilities

- **Management Plan** (with a time-line for implementation)

- **Project Evaluation and Assessment**

Project Evaluation and Assessment: The request must specify project objectives, planned outcomes, project monitoring guidelines, how outcomes will be measured, how mid-course corrections will be made, and plans to disseminate results. The effect on the quality of science and mathematics education should be clearly spelled out. Plans for evaluation and assessment will be required so that project development and implementation can be monitored at all stages. Proposers should keep in mind that the most relevant indicators of success are:

1. The extent to which the CPMSA project has brought about systemic reform within the public schools and/or districts **which has resulted in a measurable increase (a minimum factor of 2-3) in the number of high school graduates prepared to enter college as SMET majors.**

2. The extent to which academic SMET achievements, as defined by measurable quantitative student-based outcomes (grades, SMET course completion, etc.) have been addressed for a significant number of student participants.

3. The extent to which the proposed CPMSA project activities can be institutionalized when NSF funding has been discontinued.

4. The extent to which the proposed CPMSA project activities bring about a measurable change of teachers in the use of standards-based instructional methods.

In general, the proposal should present an integrated, systemic and coordinated strategy for project implementation. Note that the budget and the budget explanation are a separate part of the proposal.

> **The deadline for receipt of proposals for the Comprehensive Partnerships for Mathematics and Science Achievement Activity is October 15.**

The submission should include three (3) additional sets of forms each stapled as a unit, containing one Cover Sheet, one Summary Budget and one HRD Project Summary Data Worksheet. (For more information, see **General Program Information** section of this document).

VI. BUDGET

Applicants may request from the Foundation appropriate direct, indirect and participant costs. Separate budgets **must** be prepared for each year of project activities, **along with a cumulative five-year budget. Use the NSF Form 1030 (HRD Form) provided in Appendix B and include cost sharing in the designated column of the budget page.** For projects involving cooperation among several institutions and/or organizations, proposers may wish to consider the use of subcontracts. In a given year, the total of all subcontracts should not exceed 40% of the total budget for the project.

General NSF provisions of special relevance to this program, as well as additional **program specific regulations**, are summarized below:

- Total salaries and wages and associated fringe benefits should not exceed 30% of the total budget. Allowable costs include staff salaries, consultant salaries (limited to the current government maximum rate) from industry and institutions of higher education, materials, instrumentation, equipment and supplies for classroom and laboratory activities, teacher stipends, relevant travel (e.g., to workshops, professional association meetings for outreach efforts).

- The Foundation will consider requests for extra compensation for expanded responsibilities for teaching staff. Such requests should be clearly outlined in the budget justification section and will be reviewed on an individual basis with attention to the nature of the project as well as institutional and current NSF policies.

- Support will not be provided for general purpose office equipment such as personal computers or furniture. Requests for permanent scientific equipment, defined as any item with a unit cost of $5,000 or more and an expected service life of two or more years, will be

considered on a case-by-case basis. However, proposers should keep in mind that upgrading or expanding equipment is not a priority in this program.

- Indirect costs will not be paid on participant costs.

- Funds should be included for the principal investigator (one person only) to attend two project director meetings in the Arlington, VA area. Proposers should use their institutional guidelines regarding per diem allowances, or in the absence of such policies, the rate of $160/day.

- Arrangements for cost-sharing should be clearly detailed in the proposal's budget page, as well as the budget justification section and will be taken into consideration in decisions on the extent of NSF support. Cost sharing commitments specified in the proposal will be referenced and included as a condition of an award resulting from this announcement. Possible areas for cost-sharing, in addition to financial resources, include staff release time, participant costs (i.e., student transportation to off-site activities), and the purchase of new materials or equipment related to project activities. The use of school buildings, equipment, and materials during normal hours of operation are not considered cost-sharing. All cost-sharing amounts are subject to audit; see Grant Proposal Guide (NSF 98-2). Recognition of student/teacher participation is encouraged and reasonable costs related to that activity will be considered as an allowable cost under cost-sharing.

- Cost of entertainment, amusement, diversion and social activities and any costs directly associated with such costs (such as tickets to shows or sports events, meals, lodging, rental, transportation and gratuities) are unallowable. Expenses of awardee employees who are not on travel status, serving as hosts, or otherwise participating at meals that are primarily social occasions involving speakers or consultant are not allowable, even if the cost of the speaker or consultant are allowable. In addition, costs of ceremonies and incidental costs related to things such as bar charges and personal telephone calls of participants or guests are unallowable.

BUDGET EXPLANATION

Using the same categories as those listed on the budget page, a detail description and rationale for the level of NSF support requested for each budget item should be provided. Descriptions are particularly important for equipment requests, consultant costs, travel, and personnel salaries.

PROPOSAL BUDGET PAGE FORMAT

The budget page format that is provided in this Program Announcement and Guidelines contains three (3) columns: a column for funds requested from NSF, a column for non-federal matching funds ("Grantee Contribution" or cost sharing) and a column for total project costs. This HRD Budget Form should be used in all proposal submissions to the HRD Division.

VII. PROPOSAL REVIEW AND EVALUATION

Proposals will be reviewed for scientific and educational merit by science practitioners and educators including: precollege teachers and administrators; counselors, scientists; mathematicians; representatives of community-based and formal educational organizations; and experts in other related fields represented in the proposals, including those in the industrial

sector. Proposals will be evaluated using the new NSF merit review criteria as described on pages 10-11.

The following program specific evaluation criteria will be considered by reviewers to evaluate the appropriateness and quality of the proposal in relationship to CPMSA goals and objectives: (**1**) characteristics of the targeted city, especially the school system and its extant resources for K-12 mathematics and science education; (**2**) overall project design including problems to be addressed, measurable quantitative outcomes time frame for implementation, discipline focus, project scope and management plan (Projects should be more than a collection of unconnected activities); (**3**) **anticipated magnitude of impact on target population as measured by a substantial increase (minimum factor of 2-3 over stated baseline numbers) in precollege SMET enrollment of students and in the number of high school graduates prepared to enter college as SMET majors;** (**4**) project staff; (**5**) participant (teacher and student) demographics; (**6**) extent to which project represents a collaborative effort between, schools and/or school districts, colleges and universities industry and community organizations; (**7**) project site and resources; (**8**) appropriateness and cost-effectiveness of the project relative to its objectives and anticipated results and the degree to which resources are targeted to programmatic systemic activities as opposed to administrative support; (**9**) adequacy of program management, monitoring, dissemination and evaluation plans (including both formative and summative evaluation mechanisms) to determine stated outcomes, and the effects of proposed activities; (**10**) potential to sustain and institutionalize project activities beyond the NSF grant period: extent of cost sharing and the projected increase of cost sharing or alternate funding sources over the five-year implementation period.

VIII. AWARDS

The announcement of CPMSA awards will be made in late spring. Notification of awards is made in writing by the Foundation. NSF expects to make approximately 5 CPMSA awards in the form of Cooperative Agreements.

The Cooperative Agreement under the CPMSA will depend on the extent and scope of activities and the stage of development represented. Awards will be made for a period of up to five years. Awards may normally range from $200,000 up to a maximum of $800,000 per year. The amount to be awarded to each project will depend on the number of students that will be served by the project and the scope of project activities. Future year support will be contingent upon the availability of funding and acceptable progress in meeting project and program objectives, including monitoring and evaluation activities, as determined by NSF program staff.

It is expected that, from the outset, projects will show significant contributions (both monetary and in-kind) from other non-NSF sources. It is also expected that the project will complement and operate in a coordinated manner with other related NSF-funded educational activities within the region. This would include projects supported by other divisions in the NSF's Education and Human Resources Directorate, as well as projects supported by other federal agencies.

ALLIANCES FOR MINORITY PARTICIPATION
(AMP)

Submission Deadlines:
Proposals must be postmarked on or before October 15.

I. INTRODUCTION

The Alliances for Minority Participation (AMP) program is a comprehensive multidisciplinary undergraduate program designed to increase substantially the quantity and quality of students, including minority students and others that are currently enrolled in science and engineering fields, receiving baccalaureate degrees in science, mathematics, engineering, and technology (SMET). Subsequently, AMP aims to increase the number of these students entering graduate schools to attain the doctorate in SMET fields normally supported by NSF. The AMP program encourages the formation of coalitions among leaders throughout academia, government, industry, and other organizations. The program will maximize the potential for making a significant positive impact on minority, and other populations, participation in SMET fields over the next decade. The AMP program supports undergraduate systemic reform in alliances that include partners from both two- and four-year higher education institutions, businesses and industries, national research laboratories, local, state, and Federal agencies.   The program will maximize the potential for making a significant positive impact on maintaining the Nation's leadership role in science and technology.

II. GOALS AND OBJECTIVES

The goal of the AMP program is to increase the size of the pool of interested and academically qualified minority students eligible for SMET graduate study. AMP supports the establishment of comprehensive approaches to increase the quantity and quality of students successfully completing baccalaureate degree programs in these fields. AMP facilitates achievement of the long-term goal of increasing the number of students described above, who earn doctorates in SMET fields, especially those who choose to take faculty positions on college and university campuses. The required sustained and comprehensive action will be accomplished through the formation of alliances in partnership with the Foundation. Full participation by the science and technology community is essential to the achievement of program goals.

The substantial majority of activities intended for NSF support under the AMP program must focus specifically on undergraduate education. In addition to this principal focus, projects must also give consideration to the critical transition points in SMET education (i.e, high school-to-college; 2-year to 4-year college; undergraduate-to-graduate study; and graduate study-to-faculty career). The scope and scale of an AMP project (i.e., the number of transition points addressed) may vary among proposals, depending on project focus, needs, and goals.

The alliances to be supported under this program must be structured to address two interrelated requirements:

- First, the design of the alliance must be based on sound understanding of programmatic approaches known to be successful in meeting well-defined needs, must be cost effective, and must involve undergraduates in faculty research.

- Second, the proposed plan must be comprehensive and longitudinal, since fragmentary and isolated efforts are inevitably inadequate responses to the acknowledged scope and scale of the problem being addressed by the AMP program.

While considerable flexibility is provided to prospective proposers in AMP projects, each proposal also must:

- Establish partnerships between colleges and universities, community colleges, school systems, Federal/state/local government agencies, major national science and engineering laboratories and centers, industry, private foundations, and professional organizations, as necessary to achieve the proposed AMP objectives.

- Improve undergraduate education to achieve a demonstrated increase in the number of participating students receiving undergraduate SMET degrees. The involvement and commitment of departments and faculty in the design and implementation of improvements are essential.

- Develop an infrastructure and management plan among participating organizations and institutions that will ensure long-term continuation of AMP or similar activities beyond the term of NSF financial support.

- Develop specific evaluation plans and procedures for assessing both qualitative and quantitative changes. Every AMP proposal must specify critical data elements and quantitative goals. A baseline of pre-AMP data should be developed in order to compare post-AMP minority SMET graduation rates. Data elements demonstrating increases and factors associated with these increases must be included for both undergraduate and graduate programs.

III. ELIGIBILITY

The NSF wishes to stimulate greater involvement of scientists and engineers in designing, developing, implementing, and directing AMP proposals. Research scientists and engineers, as well as SMET educators are expected to develop and submit AMP proposals through their employing organizations.

Organizations eligible to submit proposals are limited to academic institutions that have exemplary records over several years of enrolling and retaining significant numbers of undergraduate students who are underrepresented in SMET disciplines, as described in the introductory section, and who earn baccalaureate degrees in these fields. In addition, an organization can participate in only one alliance. **The lead institution of an AMP project must offer a baccalaureate degree in SMET areas.**

It is recognized that single organizations have unique strengths and weaknesses in addressing issues related to SMET education and the workforce. Thus, the AMP program requires coalitions that capitalize on the strength of each partner to develop different resources and new approaches. Such coalitions are expected to involve colleges and universities, community colleges, state/local governments, industry, private foundations, professional organizations, and other Federal agencies as necessary to achieve program objectives. In all cases, however, true partnerships, **under the leadership of an appropriate baccalaureate-granting institution**, must be created that are characterized by joint planning and resource commitments, as well as close cooperation among participating organizations and their personnel. Prospective applicants should discuss their proposal preparation with program staff prior to proposal submission.

IV. PROJECT DESIGN

The AMP Program provides latitude to proposers in designing projects to achieve the stated AMP goals. The structure and content of proposed projects should be governed by differences in the institutional and organizational capabilities of alliance members, strategies for the formation of the alliance, and characteristics of specific localities. Project specifics may, therefore, encompass a wide variety of activities. Taken together, they must form a feasible, logical, and comprehensive effort focused upon improving the undergraduate educational experience of students in a manner that will produce a demonstrable "near-term" increase in science and engineering graduates and the promise of long-term change in the production of new Ph.D.s and their entrance into productive faculty or research careers. The strategy for implementing these projects must be clear and focused. **The leadership must be willing to attend AMP workshops and conferences.** While the primary focus of AMP is at the undergraduate level, projects *must* include activities that affect student advancement through one or more of the critical decision points - the transition between high school and college, 2- and 4-year colleges, undergraduate and graduate school, and college and the workplace. These activities allow the AMP program to build linkages between the various sectors of the science and engineering community throughout the educational process that will increase the flow of students and their advancement rate.

Examples of specific activities focusing on the undergraduate experience that may be suitable for AMP projects include but are not limited to:

- **Academic enrichment and curricular improvement activities** designed to improve the instructional capabilities in undergraduate SMET education so as to increase the achievement, motivation and retention of talented students in matriculating in these areas.

- **Student enrichment activities** employing *team building principles* (e.g., collaborative learning experiences, small group clustering in academic sections, structured work-study groups), *individual skill development* (e.g., participation in special seminars and colloquia), *involvement in undergraduate research* (e.g., academic-year research assistantships and traineeships, summer research programs at major universities and other organizations, and related personal career counseling and mentoring), and **other activities** designed to enhance student experiences and student/faculty/mentor interaction.

- **Enhancement of student participation at institutions with significant SMET enrollment** to fully utilize existing resources and enhance their capabilities to attract, educate, and graduate increased numbers of students interested in and prepared for science and engineering careers, especially in teaching and research positions within NSF-supported fields.

- **Direct student support** to enable students to attend summer enrichment activities without being penalized financially and to participate in other activities throughout the academic year.

The activities above are merely illustrative of the range of activities that are possible under the AMP Program. However, as indicated below in the AMP PROPOSAL REVIEW AND EVALUATION section of this document, proposals will be evaluated, in terms of, among other things, their potential for increasing minority participation in SMET.

V. PROPOSAL PREPARATION AND SUBMISSION

The **Project Description** must not exceed 15 pages. The 15 page limit will be enforced by NSF. The proposal must be prepared using a letter quality printer with a typeface or font giving no more than 12 point type. Each copy of the proposal should be on standard size paper and stapled only in the upper left corner. All pages must be numbered at the bottom with 2.5 cm. margins at the top, bottom, and on each side. All material submitted to the Foundation must be contained in a single package. Secure packaging is essential. The Foundation is not responsible for the processing of proposals damaged in transit.

AMP proposals **Project Description** must address the following:

- **Understanding issues and awareness of existing programs.** Demonstrate an understanding of issues related to achieving quality education and participation in SMET disciplines. Indicate knowledge of successful programs that would be used within the project. Describe involvement in past activities that bear on potential success in meeting AMP goals.

- **Project Approach.** Describe activities to be supported under the project in a clear and concise fashion. Indicate the uniqueness of the project design and the logic underlying it. If your alliance participates in other NSF supported training programs, please indicate how AMP will complement these on-going activities.

- **Project impact.** Indicate number and characteristics of students that will be affected by the proposed project. In tabular form, provide statistics by participating institutions indicating the disaggregated numbers and percentages for SMET (1) enrollment (undergraduate and graduate) of minorities and (2) the SMET degrees (undergraduate and graduate) awarded to. students. Describe how this project will permanently change participating organizations and indicate its potential for export to other organizations.

- **Alliance Partners and Key Project Personnel.** Identify major project participants and characterize the capabilities and roles played by each. Address the role of research faculty in the alliance. Provide evidence of commitment of major alliance partners, indicating the level of involvement of each participant. Discuss the qualifications of all key project personnel.

- **Management Plan/Governing Board.** Describe methods for communicating, coordinating, and managing activities throughout the alliance. As part of the management plan, each AMP project will be required to establish a Governing Board composed of Presidents of partner institutions to oversee general project operation and ensure that objectives are achieved. The Board should have representatives from collaborating organizations, leaders in SMET research and education, and appropriate state/local officials. The purpose of the Board is to provide global perspective, direction, and assistance in broadening the base of support for AMP objectives among academic, industrial, governmental, and other sectors of society. The project director should report directly to the governing board on alliance issues and concerns.

- **Grantee Contributions to Project**. The AMP Program requires substantial contributions from participating organizations. Arrangements for contributions to the cost of AMP projects should be described in detail. The cost sharing commitments specified in the proposal will be referenced and included as a condition of an award resulting from this announcement. The extent of cost sharing will be an important factor in selecting awards, particularly for those institutions that have a significant research base. At a minimum, by the fifth year of the award, cost sharing must grow so as to exceed the amount requested from NSF during the life of the project and may include funds from any non-Federal source. The source of these funds should be described. List contributions on NSF Form 1030 with budget explanation.

- **Evaluation Activities.** Describe database elements and evaluation activities that will be used to monitor annual progress under the project and discuss the personnel involved. For additional descriptions, see "Project Evaluation and Assessment" under **General Program Information**. The proposal request must specify project objectives, planned outcomes, project monitoring guidelines, and how outcomes will be measured. Proposers should keep in mind that the most relevant indicator of success is the number of participants that are making satisfactory progress towards obtaining a B.S. degree in SMET. A detailed description of the comprehensive evaluation and assessment activities must be included in the program description section of the proposal.

- **Dissemination Activities.** Provide information for disseminating results on successful programs and activities that could be implemented in other institutions.

The submission should include three (3) additional sets of forms each stapled as a unit, containing one Cover Sheet, one Summary Budget and one HRD Project Summary Data Worksheet.

VI. BUDGET

The budget should be prepared using the three-columned Form 1030 (HRD) found in Appendix C. The proposal should contain a summary budget, labeled at the top right-hand corner, indicating the total request for NSF support over the five-year period and five separate annual budgets, each labeled as to year of award in the top right-hand corner.

Separate budget breakdowns with the appropriate institutional/organizational signatures should be provided for each proposed subcontract.

Budget Explanation - Provide (1) a rationale for the level of NSF support requested for each budget item presented in Form 1030 (HRD); (2) a listing of the level of support (monetary and in-kind) coming from other sources for each budget category; and (3) an itemized summary of management costs, including personnel.

General NSF provisions of special relevance to this program and additional program specific regulations are summarized below:

- Indirect costs will not be paid on participant costs.

- Funds should be included for the principal investigator (one person only) to attend a two-day project directors meeting in Arlington, VA. Proposers should use their institutional guidelines regarding per diem allowances, or in the absence of such policies, the rate of $160/day.

- Cost of entertainment, amusement, diversion and social activities and any costs directly associated with such costs (such as tickets to shows or sports events, meals, lodging, rental, transportation and gratuities) are unallowable. Expenses of awardee employees who are not on travel status, serving as hosts, or otherwise participating at meals that are primarily social occasions involving speakers or consultant are not allowable, even if the cost of the speaker or consultant are allowable. In addition, costs of ceremonies and incidental costs related to things such as bar charges and personal telephone calls of participants or guests are unallowable.

- Senior personnel cost should not exceed 25% of the total budget.

We do encourage recognition of student/teacher participation and would consider reasonable costs related to that activity an allowable cost under cost-sharing.

PROPOSAL BUDGET PAGE FORMAT

The budget page format that is provided in this Program Announcement and Guidelines (NSF 98-) should be used in all proposal submissions to the HRD Division. This form contains three (3) columns: a column for funds requested from NSF, a column for non-federal matching funds ("Grantee Contribution" or cost sharing) and a column for total project costs.

VII. PROPOSAL REVIEW AND EVALUATION

Proposals submitted in response to this program announcement will be subject to the NEW merit review criteria approved by the National Science Board on March 28, 1997 (NSB97-27). For additional information on NSF's new merit review criteria, see the Merit Review Task Force Final Report on the NSF Home Page at http://www.nsf.gov/cgi-bin/getpub/nsbmr975. The new merit review criteria are described on pages 10-11 of this document.

Proposals will be reviewed, as appropriate, by experts selected from the research and education community. Special efforts will be made to secure reviews from individuals with strong records of achievement in working with the target audience. Each proposal will be subject to review by expert mail reviewers and panel reviewers. The top rated proposals will be invited to participate in a Reverse Site Visit review. Final award determination will be made by program staff, utilizing both reviewer comments and program priorities.

VIII. AWARDS

To ensure that each project is supported in a cost-efficient manner, the NSF contribution to a project will not normally exceed the following levels which are based on the project's current degree production capacity:

- **$1,000,000 for projects that award 500 or more B.S. degrees annually;**

- **$500,000 to $700,000 for projects that award between 300 and 499 B.S. degrees annually; and**

- **less than $500,000 for projects that award less than 300 B.S. degrees annually.**

The level of support provided under the AMP Program will also depend upon the scope, and quality of proposals submitted, as well as the availability of funds. The AMP Program will be managed through Cooperative Agreements that will be made for up to 5 years. The progress and plans of each funded project will be assessed annually, prior to receiving approval for continued NSF support. NSF expects to make approximately 3-5 new awards each fiscal year, depending, on the availability of funds.

**CENTERS OF RESEARCH EXCELLENCE IN SCIENCE AND TECHNOLOGY
(CREST)**

Submission Deadline: Proposals must be postmarked by December 1.

1. INTRODUCTION

The major goal of the Centers of Research Excellence in Science and Technology (CREST) Program, formerly known as the Minority Research Centers of Excellence Program, is the development of outstanding research centers, which through the integration of education with research, will produce new knowledge and increase the number of underrepresented minorities with Ph.D.s in science, mathematics, engineering, and technology (SMET) by making substantial resources available to upgrade the research and education capabilities of the most productive minority institutions. Two additional goals of the program are (1) to enable faculty at these institutions to cooperate with other science and engineering centers of excellence to increase the effectiveness of related science and engineering activities and (2) to build bridges for minority student career development through alliances with business, government laboratories and other universities.

A. *Eligible Institutions*

Institutions that are eligible to submit proposals under CREST are those that have:

- Enrollments of 50% or more members of minority groups that are underrepresented in advanced levels of science and engineering, e.g., Alaskan Natives (Eskimo or Aleut), American Indian, African American, Mexican American, Native Pacific Islanders (Polynesian or Micronesian), or Puerto Rican.

- Graduate programs in NSF-supported fields of science or engineering.

Additional considerations - CREST will consider support for minority institutions that have (1) demonstrated strengths in NSF-related fields, as evidenced by an existing or developing capacity to offer doctoral degrees in science and engineering disciplines; (2) the capacity to serve as a regional resource center; (3) a commitment to, and track record in, graduating minority scientists and engineers; and (4) strong alliances with university or laboratory centers focused in the same research area(s).

The CREST program will also support smaller-scale proposals to research teams at those institutions which have or can develop a productive, cooperative relationship with a major NSF-supported center; can demonstrate that the activity will aid in career development for their faculty and their minority students; and demonstrate potential of the activity for becoming the nucleus for a future CREST proposal. However, the proposal should be a part of the vision plan of the institution, and prior to submitting a proposal for a small research team award, proposers must discuss their intentions and ideas with the CREST program staff at NSF.

Institutions that have had two prior CREST awards may not participate in the program again until two years after the closing of the previous award. At that time, the new research teams from the former awardee institutions may submit proposals in disciplinary areas that are completely different from the previous award.

B. *Number of Proposals*

Each institution meeting the eligibility requirements above may submit a proposal for a CREST award. For institutions that are members of an established university system, only one proposal will be considered; individual campuses of a university or university system are not separately eligible. University systems or institutions that have more than one eligible campus location must decide whether to submit a proposal to CREST on behalf of the system as a whole or to submit a proposal on behalf of one or more selected campuses. Contact with the NSF CREST program staff before submission is encouraged.

C. *Science and Engineering Disciplines*

The policies of the CREST Program concerning eligible science and engineering disciplines are those of the National Science Foundation (NSF) and are detailed in the *Grant Proposal Guide* (NSF 98-02). While the NSF provides support in all fields of science and engineering, CREST emphasizes fields where support is not duplicated by major programs of other agencies (such as the National Institutes of Health) and priority should be given to those fields where minorities are significantly underrepresented.

NSF will not normally support research on the etiology, diagnosis, or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals. Animal models of such condition, the development and testing of drugs, or other procedures for their treatment also generally are not eligible for Foundation support. If an investigator is uncertain as to whether the proposed research is appropriate for the Foundation, he or she is encouraged to contact the CREST Program Director, Room 815, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230, telephone (703) 306-1640.

D. *Eligible Activities and Support*

The CREST program is designed to facilitate self-improvement. Responsibility for program development and execution will rest with the proposing institution, the CREST chairperson, and project director. The chairperson is expected to be the chief executive officer of the institution and the center should be in the vision plan for the university. Support may be requested for any activity that could have a direct positive influence on the competitiveness of participating scientists and engineers and the quality of the institution's research and training. Supportable activities may include, but are not limited to, exploratory research projects; acquisition of materials, research equipment and instrumentation; hiring nationally competitive scientists and/or engineers; use of visiting scientists and engineers as short-term or long-term consultants; faculty attendance at professional meetings and seminars; faculty sabbaticals and exchange programs; undergraduate and graduate research activities; development of outreach and other enhancement programs with neighboring institutions- and strengthening technical support personnel. Alliances with other NSF-funded centers for both research and education are encouraged.

In the case of small team research efforts, the proposal must include cooperative efforts between the applicant and other NSF-supported research centers, either within or outside the region. A Memorandum of Understanding (MOU) between the submitting university and the cooperating NSF Center must be included with the proposal. This MOU should contain the research expectations and a statement on the impact of the arrangement on graduate student development.

Plans may be organized around the development of individual scientists or engineers, one or more science or engineering department(s) (or equivalent units) or interdisciplinary and multi-disciplinary research areas. It is expected, however, that the CREST target group(s) will possess the potential to achieve excellence by national standards over the implementation period. In identifying the members of this target group, NSF expects that the proposing institution will strongly encourage participation by minorities, persons with disabilities and women scientists and engineers. Whether the proposed activity is considered competitive will be determined by merit review of the appropriateness and relevance of the improvement strategies to CREST program goals.

In addition to seeking funds to strengthen their own capability, funds may be requested to facilitate serving as a regional resource center for minority scientists and engineers. This may include, but is not limited to, developmental activities for faculty in neighboring institutions; enhancement of precollege teachers' knowledge in science, engineering and mathematics; undergraduate and high school student research opportunities; and developing and implementing other activities to encourage minorities to pursue careers in science and engineering.

E. *Awards and Duration*

CREST will make approximately 2-3 center awards that will provide approximately $1,000,000 per year each for up to 5 years (for a maximum of about $5,000,000) to implement a comprehensive research and training improvement plan. Eligible CREST institutions shall receive no more than 10 years of support in this program. **Four or five small team non-renewable awards in the amount of up to $200,000 a year for a period of 3 years may also be made.**

F. *Project Organization and Management for Centers*

To establish consistent terminology across center proposals, the CREST organizational structure should include a CREST Chairperson, an external Planning and Advisory Committee, an internal Executive Committee, a CREST Project Director, and science and engineering component Principal Investigators.

The CREST project should be under the direction of a person designated as Chairperson for the 5-year activity. The CREST Chairperson should be the President or Chancellor of the applicant institution and he or she should assume responsibility for the accomplishment of CREST goals. A CREST Project Director should be appointed to manage the overall CREST grant on a daily basis.

The Project Director should be a nationally recognized scientist or engineer with exceptional leadership qualities. Individual science and engineering component projects or areas being developed should be directed by appropriate principal investigators.

G. *Center Advisory Committee*

Except for small team projects, each CREST plan must include the establishment of an external Planning and Advisory Committee that will assist the institution in developing and implementing strategies for improving its research and training capabilities. This Committee should be selected and appointed by the CREST Chairperson, with advice from the proposed CREST Project Director and other appropriate institutional representatives. The Committee should include a broad spectrum of external members including senior faculty and high-level administrative staff as well as nationally competitive experts from the science and engineering community and other sources. Prospective candidates for each institution's CREST Planning and Advisory Committee must be identified in the implementation proposal.

The duties and responsibilities of the CREST Planning and Advisory Committee should include the following:

- Development and implementation of policies to govern specific CREST activities;

- The supervision and review of the overall operation and general direction of the CREST in concert with NSF and institutional requirements and policies;

- Development and oversight of CREST outreach to upgrade the science and engineering capabilities of colleges and precollege institutions in the region where the CREST is located;

- Provision of an annual report of Committee activities to the CREST Program Director; and

- Assistance with strategies to obtain commitments of funds to the CREST from the institution's own resources as well as from other non-Federal sources.

H. *Executive Committee or Working Group*

Each CREST proposal, including small team projects, must include the establishment of an Executive Committee or Working Group. In the case of centers, this body will consist of campus representatives, including (as appropriate) vice presidents, deans and CREST faculty researchers. These persons will assist in the implementation of policies set by the CREST Planning and Advisory Committee and monitor research progress on a regular basis. ***For individual or small teams, the Committee can be two or three individuals including a campus administrator and a representative from the collaborating NSF funded center.***

I. *Proposal Deadline*

The deadline date for receipt of new CREST proposals is December 1. Renewal CREST proposals should be submitted on or before February 1. Only one proposal may be submitted by each eligible institution. Each proposal should be officially submitted on behalf of an institution or organization that is legally empowered to accept grants and that will assume full fiscal responsibility for the award. Send the original and Fourteen (14) copies to:

Proposal Processing Unit - Room P60
Attention: - EHR/HRD - Program Acronym (CMPSA, AMP, or CREST)
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

II. PROPOSAL PREPARATION AND EVALUATION

A. *Preliminary Proposals are Encouraged for Center Projects Only*

Brief, informal, preliminary proposals are encouraged. They shall have a **maximum** of ten (l0) pages which must be signed by the Project Director and the Authorized Organizational Representative. Do not use the NSF standard cover page. The preliminary proposals will be reviewed to determine proposal eligibility and the appropriateness of proposal content, focus and scope.

The cover page of the preliminary proposal should contain the following information: Program/Project Title; Name of Submitting Institution; Name of Project Director; Mailing Address of Project Director; Telephone Number of Project Director; FAX Number of Project Director; and E-mail address of Project Director.

The preliminary proposal narrative must include the following:

1. Brief Overall Program Summary (1/2 page)
2. Summary of Research and Training Capabilities and List of Faculty Participants (1/2 page)
3. Biographical Sketch of Project Director (1 page)
4. Brief Program Description (overall program objectives and specific scientific projects/component proposals, activities, and strategies, (1 page)
5. **In order to provide the reviewers with an understanding and appreciation of the research discipline being proposed, include a one-page project summary/description for each component. A preproposal for small team proposals is not required. For small team proposals only one component will be submitted.** Each component proposal will be evaluated separately during review by ad hoc disciplinary panels and mail reviewers. To assist in the identification of the number and type of reviewers required for each component, indicate the NSF program to which the proposal would be sent if it were submitted separately. ***Please note that each CREST Center proposal shall be limited to no more than four (4) research components.***

Send the original and six (6) copies of the preliminary proposal by September 23 to:

> CREST Program Director
> Division of Human Resource Development, Suite 815
> National Science Foundation
> 4201 Wilson Boulevard
> Arlington, VA 22230

B. *Proposal Format* - Proposals submitted for support of a CREST Center should consist of two main parts.

1. Part I - *Plan Overview*.

This is the main body of the proposal and should contain an overview and discussion of the applicant's entire plan for improving the status of science and engineering research and training as it pertains to the mission and vision of the university, and for increasing student participation in science and engineering. This section should present a clear explanation of the proposed improvement plan from a scientific, administrative, and fiscal point of view.
This section should include the following:

- *Appropriate Forms - as in NSF Grant Proposal Guide* (NSF 98-2, i.e., coversheet, supplementary information form, etc.)

- *Table of Contents* - a listing of the major sections of the proposal and their subsections.

- *List of Participants* - name, position, and department affiliation at faculty level or equivalent.

- *Project Summary* - a 250-word summary of the improvement plan, suitable for publication. The summary should include a statement of the project objectives, methods to be employed and the significance of the proposed activities.

- *Project Description* - this constitutes the primary body of Part I and should be limited to 15 single-spaced or 30 double-spaced pages typed on one side only. The project description should include the university vision in this area; a discussion of the planning and assessment activities undertaken, and the findings and results of this process, including current barriers to research competitiveness; the overall project objectives and the specific scientific projects, activities and strategies designed to meet those objectives; the reasons for the selection of specific projects, activities and improvement strategies over other options; the expected results and long-term gains in the competitive posture of science or engineering research and training in the institution; the commitment of support by public and private entities to the project, including physical, monetary and personnel resources to be made available to the project; the plans for monitoring and administering the project; the plans for institutionalizing anticipated improvements; and the potential impact of the project in meeting NSF criteria for the support of science and engineering.

In preparing proposals, careful attention should be given to the evaluation criteria listed in Section II-D. In Part I, the Plan Overview, discussion of specific science and engineering component projects, should include sufficient scientific or engineering content to allow an assessment of the relevance and appropriateness of each proposed component to the overall project goals. **However, detailed discussions of the component proposals should be reserved for Part II.**

Bibliography - Bibliography of pertinent literature as required.

Biographical Sketches - A short biographical sketch of key management personnel involved in the overall project should be provided (exclusive of those whose biographical sketches are included in the separate component proposal).

 Proposal Budgets - All budgets must be provided on the NSF Form titled "Summary Proposal Budget" (NSF Form 1030 HRD), which may be reproduced locally. Amounts requested of NSF, along with local contributions or cost sharing, should be shown on the three-column budget form.

The Proposal may request funds under any of the categories listed so long as the item is considered necessary to the furtherance of the project activities. Guidance on the eligibility of the specific items for inclusion in component project proposals is provided in the Grant Proposal Guide (NSF 98-2) and in more detail in NSF Grant Policy Manual, Chapter VI.

(a)   Composite Budget (for all activities for all years). Centers--5 years. Small teams--3 years.

 (b) Year 1 Budget Summary (for all activities).

 (c) Copies of Year 1 Budget Summaries for all Component Project Proposals contained in Part II *Research Component Projects or Small Team Proposals* (place in order of appearance in proposal), as well as Year 1 CREST General Organizational and Management Costs Budget.

 (d) Remaining budgets as in Steps (b) and (c), above, for each subsequent project year.

 (e) Cost-Sharing Budgets that specify amounts that will be contributed by the institution.

(f)   Budget Explanatory Notes may be typed on plain bond paper and attached to NSF Form 1030 (HRD).

- *0rganization and Management Cost Budgets* - In addition to requesting support for science and engineering improvement component proposals, the implementation proposal may request support for direct and indirect costs associated with the conduct and management of the Center. These project costs, direct and indirect, should be detailed on a separate Organization and Management Component Budget.

- *Current, Pending and Prior Support* - NSF Form 1239 found in the **Grant Proposal Guide** (NSF 98-2) gives the format for reporting current and pending support for proposals, as well as for each subsequent funding request in the case of continuing grants. Besides the proposed project, all current activities to which the project director and other senior personnel have committed a portion of their time must be listed, whether or not their salaries are included in the budgets of the various projects. The number of person-months or percentage of effort to be devoted to the projects should be stated regardless of source of support. Similar information must be provided for all other proposals that are being considered by, or will be submitted soon, to other possible sponsors, including NSF.

- If a portion of this proposal is being submitted to other possible sponsors, all of them should be listed. Concurrent submission of a portion of this proposal to other organizations will not prejudice its review by the Foundation.

- The budget page format provided in this Program Announcement and Guidelines (NSF 98   ) should be used in all proposal submissions to the HRD Division. This form (NSF Form 1030 HRD) contains three (3) columns: a column for funds requested from NSF, a column for non-federal matching funds ("Grantee Contribution" or cost sharing) and a column for total project costs.

2. *Part II - Research Component Projects **or Small Team Proposals***

As noted previously, the primary information source for developing component proposals **or small team proposals** for this section is in the *Grant Proposal Guide* (NSF 98-2). Each CREST Center proposal is limited to no more than four research components.

This manual has a "Checklist for Proposal Submission" section (Appendix B) that provides guidance on the preparation of complete proposals. The two exceptions to the standard format are the Centers of Research Excellence in Science and Technology requirement for (1) NSF program identification, and (2) the CREST Project Summary.

- *NSF Program Identification* - **To assist the CREST program staff in identifying the number and type of reviewers required, each component proposal, with its own Cover Page and budget, should indicate the NSF program to which it would be sent if it were submitted separately.** In the case of multidisciplinary or interdisciplinary component proposals, all pertinent program areas should be shown on each component proposal Cover Page by listing the pertinent NSF program(s). If in doubt about the program area, please call NSF program personnel for guidance.

- *CREST Project Summary* - **Each research component in the proposal will be evaluated separately from the Part I Plan Overview during review by *ad hoc* disciplinary panels and mail reviewers.** In order to provide reviewers with an understanding of the full plan, each component proposal should include a one-page section that summarizes the Improvement Plan and describes the relevance and importance of the component project to the overall improvement plan. This section should be inserted between the "Component Project Summary" and "Project Description" sections of the component proposal.

C. *Review of CREST Proposals*

Proposals submitted to the CREST program will be reviewed on three levels: (a) commitment and dedication of the institution to the goals of the program; (b) scientific and engineering quality (i.e., the potential to make significant improvements and the likelihood of contributing to the national scientific and engineering knowledge base); and (c) the relevance and appropriateness of the strategies employed to enhance the movement of minorities into science and engineering careers. The review process will be carried out in three stages:

1. Disciplinary mail review by recognized scientists and engineers of the scientific and engineering components for the Research Component Projects or Small Team Proposal.

2. Review by an interdisciplinary panel of recognized academic and scientific experts, in light of the mail reviews and their own reading of the proposals. (CREST Center awards only).

3. Site visits to applicant institutions by experts knowledgeable about development programs, including NSF program officers. In addition, annual reverse site visits to NSF will be required for appropriate CREST staff.

D. *Specific Review Criteria*
1. *Review of Improvement Plan Overview (Part 1) of CREST Center Proposals*

In addition to the new NSF merit review criteria, described under the Proposal Review Section, the CREST Improvement Plan Overview will also be reviewed by a special panel selected by CREST staff, for the intellectual merit and quality of the proposed activity, the broad impact of the activity and the following criteria:

- **Scientific and Engineering Excellence of the Plan and its Potential.**

The REVIEW PANEL and/or the SITE VISIT TEAM will evaluate the entire CREST proposal in light of the mail reviews and their own expertise in reading the proposal.

- **Potential for Enhancing Minority Participation in Science and Engineering.**

The CREST proposal should provide evidence of substantial involvement of minority faculty and students in science and engineering programs and research. High university-wide minority enrollment alone is not sufficient.

- **Relevance of Selected Fields of Research to NSF Goals.**

The CREST program will focus on NSF fields where support is not duplicated by major programs of other agencies. Proposals for biomedical or behavioral research in fields normally supported by the National Institutes of Health will not be accepted. Priority will be given to those research areas where minorities are significantly underrepresented.

- **Adequacy and Potential of Existing Scientific and Engineering Base.**

The CREST program will provide support to strengthen existing meritorious research activities, such as those that have received at least one Research Improvement in Minority Institutions (RIMI) award. Meritorious research projects, for the CREST competition, will be those that have led to publications in refereed journals and increased student participation in science and engineering. The CREST proposal should describe the relation of the planned activities to other grant-supported operations and must demonstrate: (a) that the existing base is sufficiently strong to permit significant advances in quality with the CREST funds, and (b) that a CREST award will result in a substantial long-term increase in the base level.

- **Institutional Commitment to CREST Goals.**

Institutional commitment to strengthening research and training capabilities will be a critical factor in proposal evaluation. This may be demonstrated by evidence of long-term institutionally-based initiatives to enhance science or engineering programs and by other direct and indirect financial contributions to the CREST program. The commitment of institutional and non-Federal funds (especially from industry) to the specific proposal, as well as plans for continued growth and maintenance of Centers beyond the term of the NSF award, will be a positive factor in evaluation. Cost sharing for capital equipment is required and will be negotiated. Equipment cost sharing is expected. The cost sharing commitment specified in the proposal will be referenced and included as a condition of an award resulting from this announcement.

- **The Extent of Regional Outreach and Impact of the Proposed Center.**

Research and training activities in the CREST proposal should show promise of making a contribution to the overall strengthening of science and engineering awareness and productivity in a particular region and for enhancing minority student participation in science and engineering over the long term.

- **The Adequacy of the Management Plan.**

Proposals to the CREST program should describe the institution's system for managing existing research projects including information of staffing and line responsibilities. This can be omitted for small team projects.

- **Uniqueness of the Center Project.**

Each institution submitting a proposal to the CREST Program should discuss its unique capability which makes it especially qualified to become a productive Center of Research Excellence.

2. *Review of Research Components **and Small Team Proposals***

The research plans specified in the science and engineering components of the CREST proposals will be reviewed by ad hoc mail and panel reviewers nominated by disciplinary program officers and by CREST staff, using the standard NSF criteria for research excellence. **The NSF uses new merit review criteria as described on pages 10-11.**

In light of the CREST programs objectives, reviewers are asked to consider the Merit Review Criteria with emphasis on:
   1. **Excellence of the research environment**
   2. **Discovery of new knowledge**
   3. **Utility or relevance of the research**
   4. **Effectiveness of the integration of research and education**
   5. **Effectiveness in preparing a diverse science and engineering workforce**
   6. **Effectiveness of any proposed alliances**
   7. **Value added from the team or center approach**

III. OTHER CONSIDERATIONS

A. *Education and Human Resources*

Each research improvement component must provide a specific statement on how the proposed research will contribute to the development of human resources in science and engineering at the undergraduate, graduate, and postdoctoral levels. **Proposers are strongly encouraged to include other outreach efforts already in place such as NSF AMP or K-12 endeavors. If there are plans to work with high school students, this information should also be included.** Information provided may include how the research will impact on student training, course preparation, outreach and seminars.

B. *Biographical Information*

Biographical information is required for all key senior personnel. Each biographical sketch should provide the following:

(1) data concerning educational background and career of Project Director(s).

(2) a list of up to five publications most relevant to the research proposed and up to five other significant research publications. Patents, copyrights, or software systems developed may be substituted for publications. These publications may overlap the requirement for a list of all publications resulting from and citing prior NSF support. Only the list of ten will be used in merit review.

(3) a list of names of graduate students with whom the PI has had an association as thesis advisor and postdoctoral scholars sponsored by the PI over the past five years, with a summary of the total numbers of graduate students advised and postdoctoral scholars sponsored.

(4) to avoid potential conflicts of interest in merit review, a list of scientists with whom the investigator has had a long-term association and/or with whom he/she has collaborated on a project or a book, article, report or paper within the last 48 months, and the investigator's own graduate and postdoctoral advisors.

C. *Fiscal Arrangements*

A single award will be made to the organization submitting the proposal (grantee) in support of the projects selected for support by NSF. The submitting organization shall agree to serve as fiscal agent for the project. **The CREST award will be a three-year (small team) grant or five-year (center) Cooperative Agreement.** Funds for Centers will be made available to the project annually on an approximate rate of up to $1.0 million per year for up to five years. Each yearly increment will be contingent upon annual documentation by the grantee of satisfactory progress and the availability of program funds. Before providing support for the last two years, a comprehensive review will be conducted by the Foundation to evaluate progress and determine whether any modifications are necessary. The grantee organization will prepare a report describing achievements, problems encountered, their resolution, desired changes in operation (if any), and a budget for the remainder of the project.

D. *Allowable Costs*

In addition to the description of allowable costs in the Grant Proposal Guide (NSF 98-2), the following guidelines are provided:

1. Personnel Cost

a.   Salaries and Wages for Senior Personnel
Support for released time of an investigator or other senior personnel during the academic year, with adequate justification, may be requested. A maximum of 2/9 of the academic year salary for the summer may also be requested.

b. Other Personnel
Support for research assistants, research associates, or secretarial and clerical staff should be proportionate to the full time equivalent person-months devoted to the project.

c. Fringe Benefits
The institution's normal policies should be applied in the treatment of fringe benefits as direct costs.

2. Travel
Travel may include attendance at professional meetings, collaboration with other investigators, field work or other activities that enhance the investigator's research capabilities.

3. Equipment and Installation
Purchase of research equipment is allowable. Charges for fixed or moveable equipment may include cost of installation.

4. Other Costs
Support may also be requested, as direct costs, for materials and supplies, publication costs, consultant services, computer service and subcontracts.

5. Renovation and Alteration
While construction costs are, in general, not allowable, requests for support of renovation and alterations may be included in a CREST proposal, **when appropriate** for the conduct of the proposed program.

6. Library Support
General library support is not allowable as a direct cost, but the costs of books and periodicals directly related to the proposed research are allowable (not including binding costs).

E. *Project Evaluation and Assessment*

The CREST program will work in concert with the overall program evaluation design of the Directorate for Education and Human Resources. In addition to the special conditions and elements specified for evaluation in the CREST Cooperative Agreement, other data elements will be identified in individual project documents. Each CREST project will be monitored and assessed periodically by project staff and NSF program staff, including appropriate on-site visits by external consultants and disciplinary experts when deemed helpful.

Appendix A

HUMAN RESOURCE DEVELOPMENT

PROJECT SUMMARY DATA WORKSHEET

INSTRUCTIONS AND CODES FOR COMPLETING PROJECT SUMMARY DATA WORKSHEET

Item 1. Enter the **Name of the Institution**, including the branch or campus.

Item 2. Enter the **Name of the Principal Investigator**.

Item 3. The **Project Title** should be as descriptive as possible.

Item 4. A. Enter the names **of all schools and/or undergraduate institutions** that are involved in the project

(including school systems, community colleges, colleges and universities).

B. Enter the names of all **other organizations that are** involved in the project (including businesses, private and public laboratories, community organizations,

Item 5. Select a two-digit **Major Discipline Code** that corresponds to the Field that is most descriptive of your

proposal area focus:

12-Chemistry 13-Physics 21 -Mathematics 31 -Computer Science

49-Earth Science 59-Engineering 69-Life Science 89-Social Sci/Psych.

99-Other (Please Specify)

Item 6. Enter the **Focus Code(s)** for the project: Elementary School **(ES),** Middle School **(MS),** High School

(HS), Undergraduate **(UG),** Masters **(MT),** Doctorate **(DT). THE CHOICE (S) MUST BE SUBSTANTI**

ATED IN THE NARRATIVE.

Item 7. Enter the **Highest Degree Code** to indicate the highest degree offered in science or engineering by

any department on the campus submitting this proposal: **A** = Associate; **B** = Baccalaureate; **M** =

Masters; **D** =Doctorate. Precollege institutions should enter NA for *item 7.*

Item 8. Enter the **Institution Code** to indicate whether the institution that serves as the awardee institution is:

PUBL = Public; **PRIV** = Private; **CONS** = Consortium.

Item 9. Enter the project's **Scope Code** to indicate the sphere of impact of the project: **L** = Local; **S** = State;

R = Regional; **N** = National.

Item 10. Enter the **Activity Period Code** of the Project: **S** = Summer Only; **A** = Academic Year Only; **B** = Both

Summer and Academic Year; MS = Multiple Summers Only; MA = Multiple Academic Years Only; MB =

Multiple Summer and Academic Years.

Item 11. Select a two-digit **Site Code** that corresponds to the site where the majority of the proposed activities

will take place.

11-K-12 School Facility 12-Off-School Grounds/Community-Based

22-College or University 31-Private Industry

41-National Laboratory 99-Other (Please specify)

Item 12. Please furnish the number of weeks students will be involved in summer project(s).

Item 13. If the proposed activity is new to your campus (or coalition), use 11; if not new, use 22.

Item 14. Enter (in any order) as many **Participant Codes** as apply to indicate if this project has, as a significant

component, science or engineering education for any of these groups: **W** = Women-, **M** = Minorities;

D = Disabled; **T**= Pre-service Teachers; **C** = Continuing Education; **F** = College Faculty. **EACH**

GROUP CLAIMED MUST BE SUBSTANTIATED IN THE PROPOSAL NARRATIVE.

item 15. Check the, type of project activities and list other major activities proposed.

Item 16. The **Summary of the Proposed Work** should be a concise description of the project. It is limited to 20

single-spaced lines. Care should be taken when writing the Summary-It is the reviewer's first impres

sion of the project's merit. If the project is funded by NSF, the Summary will be published.

Items 17-20. Please note that participants are those persons who are the focus of project activities versus staff who

render services. Categorize teacher/faculty participants and staff according to the educational level at

which most of their activities occur.

Human Resource Development Project Summary Data Worksheet _____
Program/Initiative Submitted to: CPMSA/AMP/CREST
_____

Type all entries. See the reserve side for instructions and codes to be used in filling out this from.

1. Name of Submitting Instruction: _____
2. Name of Principal Investigation:_____
3. Project Title:_____
4. Number of Participating Schools and/or Undergraduate Institutions:_____

    A. List all Participating Institutions and Organization involved:
    _____

    B. Number of Other Participating Organizations: _____

    C. List all Other Organizations Participating in Project Activities:
    _____

Proposal Description Codes (see back of page)

5. Major Discipline:_____   6. Focus:_____   7: Highest Degree:_____
8. Institution:_____   9. Scope:_____   10: Activity Period:_____
11. Project Site (s)_____   12. Project Length:___   13: Project Status:_____
14. Participant(s):_____

15. Project activities (please check as appropriate):

☐ Academic year research   ☐ Seminars/colloquia   ☐
   Teacher enhancement activities   Summer research
   Faculty mentoring   Student enrichment activities
☐ Career counseling   ☐ Curriculum reform
   Student enrichment activities   ☐

☐ Other (Please Specify):_____
_____
_____
_____

16. Summary of Proposed Work:

The summary of the Proposed Work should be concise description of the project. Limit your summary to 20 single Spaced lines typed on 8.5 by 11 plain white paper.

NSF Form 1325 (10-91) (Revised)

17. The following **Projected Student Participants Racial/Ethnic Profile Worksheet** is required for all Programs

Project Staff Participants Racial/Ethnic Profile Worksheet						
Educational Level (entering)	Black	Hispanic	Pacific Islander	American Indian	All Others	Total
PRECOLLEGE						
K-6						
Seventh grade						
Eighth grade						
Ninth grade						
Tenth grade						
Eleventh grade						
Twelfth grade						
UNDERGRADUATE						
Freshmen						
Junior						
Senior						
GRADUATE						
Master						
Doctorate						
Total						

18. The following **Projected Teacher/Faculty Participants Racial/Ethnic Profile Worksheet** is required for all Programs

Project Staff Participants Racial/Ethnic Profile Worksheet						
Educational Level (entering)	Black	Hispanic	Pacific Islander	American Indian	All Others	Total
PRECOLLEGE						
K-6						
Seventh grade						
Eighth grade						
Ninth grade						
Tenth grade						
Eleventh grade						
Twelfth grade						
UNDERGRADUATE						
Freshmen						
Junior						
Senior						
GRADUATE						
Master						
Doctorate						
Total						

19. The following **Projected Staff Racial/Ethnic Worksheet is required for all Programs.**

Project Staff Participants Racial/Ethnic Profile Worksheet						
Educational Level (entering)	Black	Hispanic	Pacific Islander	American Indian	All Others	Total
PRECOLLEGE						
K-6						
Seventh grade						
Eighth grade						
Ninth grade						
Tenth grade						
Eleventh grade						
Twelfth grade						
UNDERGRADUATE						
Freshmen						
Junior						
Senior						
GRADUATE						
Master						
Doctorate						
Total						

20. Those Submitting proposals to the AMP/CREST programs must complete the following **Degree Production Worksheets:**

Degree Awarded to Undergraduate minorities	B.S.		M.S.		Ph.D.		Racial/Ethnic Distribution for B. Degree Awarded in 1994 (Give Numbe			
Institution	Awarded in 1998	Projected by 2004	Awarded in 1998	Projected by 2004	Awarded in 1998	Projected By 2004	Blacks	Hispanics	American Indians	A Oth
Total										

21. Those submitting proposals to **CPMSA** must complete the following High School (HS) Diploma Production Worksheet. (Include only graduates who completed college preparatory course sequences)

CPMSA Programs	Diplomas Awarded to Undergraduated Minorities		Racial/Ethnic Distribution for Diplomas Awarded. Give Numbers for the most recent year available:____Year____			
School Districts	# Awarded Year:_____	*Five-Year Projection	Blacks	Hispanics	American Indians	All Others

Total						

*Five-Year Projection-represents the projected number of diplomas (only students competing college preparatory courses) that will be awarded to underrepresented students five-year form the date given in the previous column.

Appendix B

HUMAN RESOURCE DEVELOPMENT

PROPOSAL BUDGET FORM

ORGANIZATION				PROPOSAL NO.	DURATION (MONTHS)	
					Proposed	Granted
RICIPAL INVESTIGATOR/PROJECT DIRECTOR				AWARD NO.		

A. SENIOR PERSONNEL: PI/PD,Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.6. show number in brackets)	NSF FUNDED PERSON-MOS.			FUNDS REQUESTED FROM NSF	NON-FEDERAL MATCHING FUNDS	TOTAL PROJECT COSTS
A.	CAL.	ACAD.	SUMR.			
.				$	$	$
.						
.						
.						
. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)						
. ( ) TOTAL SENIOR PERSONNEL (1-5)						
. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
. ( ) POST DOCTORAL ASSOCIATES						
. ( ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER,ETC.)						
. ( ) GRADUATE STUDENTS						
. ( ) UNDERGRADUATE STUDENTS						
. ( ) SECRETARIAL-CLERICAL						
. ( ) OTHER						
TOTAL SALARIES AND WAGES (A+B)						
. FRINGE BENIFITS (IF CHARGES AS DIRECT COSTS)						
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)						
. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1000):						
TOTAL PERMANENT EQUIPMENT						
. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)						
2. FOREIGN						

. PARTICIPANT SUPPORT COSTS						
	Stipend	Travel	Subsist.	Other		
. K-12 (Students) #_____	$_____	$_____	$_____	$_____		
. K-12 (Teachers) #_____	$_____	$_____	$_____	$_____		
. Undergraduate #_____	$_____	$_____	$_____	$_____		
. Graduate #_____	$_____	$_____	$_____	$_____		
. Faculty #_____	$_____	$_____	$_____	$_____		
( ) TOTAL PARTICIPANT COSTS						
. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES						
2. PUBLICATION COSTS/PAGE CHARGES						
3. CONSULTANT SERVICES						
4. COMPUTER (ADPE) SERVICES						
5. SUBSCONTRACTS						
6. OTHER						
TOTAL OTHER DIRECT COSTS						
. TOTAL DIRECT COSTS (A THROUGH G)						
. INDIRECT COSTS (SPECIFY)						
OTAL INDIRECT COSTS						
. TOTAL DIRECT AND INDIRECT COSSTS(H+I)						

. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE 252 AND 253)			
. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)		$	$	$

I/PD TYPED NAME & SIGNATURE*	DATE	FOR NSF USE ONLY		
		INDIRECT COST RATE VERIFICATION		
NST. REP. TYPED NAME & SIGNATURE*	DATE	Date Checked	Date of Rate Sheet	Initials-DGA

SF Form 1030HRD (9/94)

*SIGNARURES REQUIRED ONLY FOR REVISED BUDGET (GPM 233)