

Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM)

Program Solicitation

NSF 04-546



National Science Foundation

Directorate for Biological Sciences

Directorate for Education and Human Resources

Directorate for Mathematical and Physical Sciences

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

April 26, 2004

March 30, 2005

March 29, 2006

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM)

Synopsis of Program:

The goal of the Undergraduate Biology and Mathematics (UBM) activity is to enhance undergraduate education and training at the intersection of the biological and mathematical sciences and to better prepare undergraduate biology or mathematics students to pursue graduate study and careers in fields that integrate the mathematical and biological sciences. The core of the activity is long-term research experiences for interdisciplinarily balanced cohorts of at least four undergraduates. Projects should focus on research at the intersection of the mathematical and biological sciences. Projects should provide students exposure to contemporary mathematics and biology, addressed with modern research tools and methods. That is, projects must be genuine research experiences rather than rehearsals of research methods. Projects must involve students from both areas in collaborative research experiences and include joint mentorship by faculty in both fields. In addition, it is expected that projects will strengthen the research and education capacity, infrastructure, and culture of the participating institutions. To this end, projects should create models for education in the mathematical and biological sciences and influence the direction of academic programs for a broad range of students. UBM is a joint effort of the Education and Human Resources (EHR), Biological Sciences (BIO), and Mathematical and Physical Sciences (MPS) directorates at the National Science Foundation (NSF).

Cognizant Program Officer(s):

- Samuel M. Scheiner, Program Director, Directorate for Biological Sciences, Division of Environmental Biology, 635 N, telephone: (703) 292-8481, fax: (703) 292-9064, email: sscheine@nsf.gov
- Michael H. Steuerwalt, Program Director, Directorate for Mathematical & Physical Sciences, Division of Mathematical Sciences, 1025 N, telephone: (703) 292-4860, fax: (703) 292-9032, email: msteuerw@nsf.gov
- Elizabeth J. Teles, Lead Program Director (MATH) (On-Detail), Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-8670, fax: (703) 292-9015, email: ejteles@nsf.gov
- Calvin L. Williams, Program Director (MATH), Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-4642, email: cwilliam@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.074 --- Biological Sciences
- 47.076 --- Education and Human Resources
- 47.049 --- Mathematical and Physical Sciences

Eligibility Information

- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 12
- **Anticipated Funding Amount:** \$3,200,000 in FY2004 pending availability of funds

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:**

An administrative allowance, limited to 25% of the participant stipend support only, is allowed for UBM awards in lieu of indirect costs (enter in line I of the proposal budget).

- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for

further information.

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
 - April 26, 2004
 - March 30, 2005
 - March 29, 2006

Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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I. INTRODUCTION

The goal of the Undergraduate Biology and Mathematics (UBM) activity is to enhance undergraduate education and training at the intersection of the biological and mathematical sciences and to better prepare undergraduate biology or mathematics students to pursue graduate study and careers in fields that integrate the mathematical and biological sciences. UBM aims to broaden undergraduate research experiences and enhance capacity for, infrastructure in support of, and commitment to excellence in undergraduate education. It is a joint effort of the Education and Human Resources (EHR), Biological Sciences (BIO), and Mathematical and Physical Sciences (MPS) directorates at the National Science Foundation (NSF).

There has been an explosion of knowledge in the life sciences over the past twenty years that cuts across all levels from molecules to ecosystems. Current research is often characterized by integrative and interdisciplinary approaches. At the center of this explosion of knowledge is a revolution in instrumentation, computational abilities, information systems, and mathematical tools.

There has been a parallel growth in understanding in the mathematical sciences. Theoretical advances in complexity, dynamical systems, and uncertainty, coupled with advances in modeling and in computational methods, have helped mathematicians and statisticians put ideas into action. This has enabled expansion in the use of mathematics and statistics beyond the traditional fields of physical science and engineering. As that expansion has taken hold, the life sciences and other fields are posing new kinds of questions for the mathematical sciences, stimulating further the growth of mathematical ideas.

Thus, the intersection of the biological and mathematical sciences is a fertile field for both sets of disciplines, where results in each area lead to advances in the other. However, there are comparatively few people able to work in this intersection. UBM aims to transcend traditional boundaries in educating biological and mathematical scientists. It should expand the community of faculty capable of working at the intersection of the disciplines and better prepare students for more advanced work in both the biological sciences and the mathematical sciences. Projects must involve students from both areas in collaborative research experiences and include joint mentorship by faculty in both fields. Projects should create models for education in the mathematical and biological sciences and influence the direction of academic programs for a broad range of students.

Individually, UBM projects will have a significant impact on the undergraduate programs of participating institutions. Collectively, they will strengthen the nation's research enterprise by providing new mechanisms for attracting a larger, more diverse group of students to careers that involve both the mathematical and biological sciences.

II. PROGRAM DESCRIPTION

UBM provides opportunities for funding of undergraduate education and training efforts that integrate the biological sciences and mathematical sciences. Such efforts are expected to:

- Be grounded in research activities involving both mathematical and biological sciences;
- Connect to regular academic studies, influencing the direction of academic programs for a broad range of students.
- Involve students from both areas in significant research experiences that connect to research at the intersection of the disciplines; and
- Show commitment to joint mentorship by faculty in both fields.

Proposals of duration of up to five years are invited. We encourage projects of a five year duration. Long-term projects will be reviewed in the third year; fourth- and fifth-year funding will depend on the outcome of this review. Research activities should focus on areas funded by the Division of Mathematical Sciences and the Directorate of Biological Sciences; NSF does not normally support 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.

Within this context, there is room for a variety of possible emphases, ranging from undergraduate research participation, through curriculum and faculty development, as well as internships outside the academic institution. Key characteristics of projects are expected to include:

- Student involvement in innovative research at the forefront of the biological and mathematical sciences;
- Four or more students involved as a cohort, working and learning together;
- Long-term involvement of each student with project activities - more than a semester or a summer - to provide immersion, intense involvement in research, and mutual reinforcement between the research and classroom activities;
- Extensive, interdisciplinary mentoring;
- A diversity of students with attention to ethnic and gender diversity;
- Use of program models to motivate curriculum changes and faculty development;
- The ability to affect programs and students beyond those directly involved in the project.

UBM will include annual meetings of awardees to share information and encourage student/faculty exchanges among awardees. Opportunities for partnering across institutions and for developing international collaborations are welcome. Fieldwork may be appropriate. While the core of UBM research projects and educational activities is the intersection of the biological and mathematical sciences, it is open to projects that include other disciplines as appropriate such as the physical sciences, social sciences, computer sciences, and engineering. However, UBM funds can only be used for students or other personnel from the biological or mathematical sciences.

Dissemination of information about project outcomes to a broader audience is also important. UBM aims to create new models for approaches to interdisciplinary education and training. UBM projects should strengthen educational capacity, infrastructure, and culture at participating institutions, as reflected in the number and inclusiveness of participating mentors and students and the quality of their research experience. Educational culture is linked to campus resource investment and to the value placed on participation by mentors in the undergraduate research enterprise by the institution. Educational culture also embraces the fostering of student learning and professional development and an appreciation for the integration of research and education. UBM projects should contribute substantially to an enhanced and sustainable undergraduate educational enterprise that strengthens mathematical training or education for those students studying biology and interdisciplinary training for those studying mathematics.

The program encourages collaborations that bring together biological and mathematical scientists from associate, baccalaureate, masters, or Ph.D. granting institutions, minority serving institutions, national and regional organizations, and that may involve industrial or government laboratories.

Eligible Student Participants: Undergraduate student participants supported with NSF funds must be citizens or permanent residents of the United States or its possessions. An undergraduate student is a student who is enrolled in a degree program (part-time or full-time) leading to a baccalaureate or associate degree. Students who are transferring from one institution to another and are enrolled at neither institution during the intervening summer may participate. High school graduates who have not yet enrolled and students who have received their bachelor's degrees generally are not eligible. While undergraduates at all stages are eligible, students will be involved in genuine interdisciplinary research and must be accordingly capable. The heart of the UBM project must be a research experience, not simply a classroom experience. Thus, the proposal should outline the process that will be used to select student participants, including ensuring that the students have the proper prerequisites. Collaborations between universities, four-year colleges, and two-year colleges are encouraged.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

We anticipate awarding up to 12 standard or continuing grants.

The duration of projects may be up to five years, and we encourage projects of a five-year duration. Projects longer than three years will be reviewed in the third year, and further funding will depend on the outcome of this review.

Total award sizes should not exceed an average of \$250,000 per year. For example, an award for a project of five years duration is limited to a maximum of \$1.25 million.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

The following instructions supplement the GPG guidelines.

1. **Cover Sheet.** The title of the project should begin "UBM:"

2. **Project Description.** The project description is not to exceed 15 pages in length and should contain the following items:
 - a. *Results from Prior Support* (if applicable).

 - b. *Overview.* Provide a brief description of the objectives of the proposed UBM project (including the central theme(s) of the research projects), the targeted student participants, the intellectual focus and innovative strategies, the organizational structure and timetable, and organizational endorsement of the UBM activity.

 - c. *Nature of Student Activities.* Proposals should address the approach to undergraduate research training being taken, and must provide detailed descriptions or examples of the interdisciplinary research projects that students will pursue. Any other activities (e.g., seminars, group discussions,

lectures, workshops) should be discussed as well as the activities for providing a cohort experience for the group. A schedule of the year-round activities should be provided.

- d. *Connection to Regular Academic Studies.* Proposals should describe the ways in which the UBM activity will influence academic programs for a broader range of students, including curriculum development and changes to strengthen mathematical training for biology students and interdisciplinary training for mathematics students.
- e. *Research Environment and Mentoring Activities.* For individuals who will serve as research mentors, proposals must describe the mentoring activities planned and the past experience and record of involvement with undergraduate research.
- f. *Student Recruitment and Selection.* The recruitment plan should be described with as much specificity as possible. NSF is particularly interested in increasing the participation in research of women, underrepresented minorities, and persons with disabilities. Underrepresented minorities are African-Americans, Hispanics, Native Americans, and Native Pacific Islanders. Only undergraduate students who are citizens or permanent residents of the United States or its possessions can be supported with NSF funds.
- g. *Project Management.* A clear management plan should be described, including mechanisms for dealing with possible changes in faculty participation over the course of the project.
- h. *Project Evaluation and Reporting.* A plan for qualitative and quantitative evaluation of the proposed project must be provided. The objective of the evaluation process is to measure qualitatively and quantitatively the success of the project in achieving its goals, particularly the degree to which students have strengthened their capacity to do research at the intersection of the mathematical and biological sciences. The evaluation plan should include metrics on such key issues as the number of mathematics and biology majors supported, the biology and mathematics research fields served, and the impact on the programs at the organizations involved. Demographic data of the students supported must also be reported. Although not required, the principal investigator may wish to engage educational research specialists in planning and implementing the project evaluation. Additionally, it is highly desirable to have a structured means of tracking participating students beyond graduation with the aim of gauging the degree to which the research experience has been a lasting influence as they follow their career paths.

Evaluation may involve periodic measures throughout the project to ensure that it is progressing satisfactorily according to the project plan, and may involve pre- and post-project measures aimed at determining the degree of student learning that has been achieved as a result of the project. **In particular, mid-term assessment (at the end of the third year) is deemed critical.** For guidance, proposers may wish to consult the NSF on-line document, "User-friendly Handbook for Project Evaluation" (NSF 02-57), <http://www.nsf.gov/pubsys/ods/getpub.cfm?nsf02057>).

3. **Biographical Sketches.** The GPG guidelines for biographical material apply; however, senior personnel are encouraged to include publications with undergraduate co-authors (with the student labeled by an asterisk) and other activities or accomplishments relevant to a successful UBM activity. Senior personnel are the principal investigator, any co-principal investigators, and any other faculty/professionals who are anticipated to serve as research mentors.
4. **Project Budget.** Project costs may include student stipends as well as research supplies or laboratory use fees, housing (if appropriate during the summer months), and travel for student participants. The budget may also include

items such as faculty salaries, salaries for graduate students or post-doctoral scholars to the extent that they serve as auxiliary mentors for the undergraduates, support for coordination activities, and equipment or supplies. As a guide to budget development, typical annual student stipends are \$15/hr. Student costs should be entered in budget Line F: Participant Support Costs. Funds should be budgeted for travel to an annual awardees meeting.

Proposers are reminded to identify the program announcement/solicitation number (04-546) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

Cost sharing is not required in proposals submitted under this Program Solicitation.

Indirect Cost (F&A) Limitations:

An administrative allowance, limited to 25% of the participant stipend support only, is allowed for UBM awards in lieu of indirect costs (enter in line I of the proposal budget).

Other Budgetary Limitations:

Total award sizes are limited to an average of \$250,000 per year; for example, an award with a five-year duration is limited to a maximum of \$1.25 million.

C. Due Dates

Proposals must be submitted by the following date(s):

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

April 26, 2004

March 30, 2005

March 29, 2006

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days

following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or 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 the 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?

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?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

All proposals will be evaluated on the extent to which they include involvement of both mathematical and biological scientists in the project, and the degree of student participation and immersion in the proposed activities.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

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

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Samuel M. Scheiner, Program Director, Directorate for Biological Sciences, Division of Environmental Biology, 635

N, telephone: (703) 292-8481, fax: (703) 292-9064, email: sscheine@nsf.gov

- Michael H. Steuerwalt, Program Director, Directorate for Mathematical & Physical Sciences, Division of Mathematical Sciences, 1025 N, telephone: (703) 292-4860, fax: (703) 292-9032, email: msteuerw@nsf.gov
- Elizabeth J. Teles, Lead Program Director (MATH) (On-Detail), Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-8670, fax: (703) 292-9015, email: ejteles@nsf.gov
- Calvin L. Williams, Program Director (MATH), Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-4642, email: cwilliam@nsf.gov

For questions related to the use of FastLane, contact:

- Antionette T. Allen, Computer Specialist, Directorate for Education & Human Resources, Division of Undergraduate Education, 840 S, telephone: (703) 292-4646, fax: (703) 292-9016, email: aallen@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF *E-Bulletin*, which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's *Custom News Service* (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

Related Programs:

- Research Experiences for Undergraduates ([NSF 03-577](#))
- Undergraduate Mentoring in Environmental Biology ([NSF 03-585](#))
- Undergraduate Research Centers ([NSF 03-595](#))

- Research at Undergraduate Institutions ([NSF 00-144](#))
- Collaborative Research at Undergraduate Institutions ([NSF 03-514](#))
- Centers For Learning and Teaching ([NSF 03-522](#))
- Science of Learning Centers ([NSF 03-573](#))
- Science, Technology, Engineering, and Mathematics Talent Expansion Program ([NSF 03-548](#))
- Louis Stokes Alliances for Minority Participation (LSAMP) Program ([NSF 03-520](#))
- Historically Black Colleges and Universities Undergraduate Program ([NSF 03-594](#))
- Robert Noyce Scholarship Program ([NSF 03-544](#))

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

- **For General Information** (NSF Information Center): (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090 or (800) 281-8749

- **To Order Publications or Forms:**

Send an e-mail to: pubs@nsf.gov

or telephone: (703) 292-7827

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