NIBIB-NSF Bioengineering and Bioinformatics Summer Institutes Program (BBSI)

A Joint Program for Interdisciplinary Research Training and Education

Program Solicitation

NSF 05-611

***Replaces Document* NSF 02-109**

National Science Foundation
Directorate for Biological Sciences
Directorate for Education and Human Resources
Directorate for Engineering
Directorate for Mathematical and Physical Sciences
Directorate for Computer and Information Science and Engineering

National Institutes of Health
National Institute of Biomedical Imaging and Bioengineering

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

November 29, 2005

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NIBIB-NSF Bioengineering and Bioinformatics Summer Institutes Program (BBSI)
A Joint Program for Multidisciplinary Research Training and Education

Synopsis of Program:

The National Science Foundation (NSF) and the National Institute of Biomedical Imaging and Bioengineering (NIBIB) of the National Institutes of Health (NIH) have identified bioengineering and bioinformatics as essential interdisciplinary disciplines for physical and life sciences. The agencies will continue collaborating on an important effort to meet anticipated bioengineering and bioinformatics human resource needs, specifically by targeting the career "pipeline" at a critical juncture.

The purpose of this program is to provide undergraduate and early-stage graduate students majoring in the biological sciences, computer sciences, engineering, mathematics, and physical sciences with well-planned, interdisciplinary bioengineering or bioinformatics research and education experiences in active 'Summer Institutes', thereby increasing the number of individuals pursuing careers in bioengineering and bioinformatics at the graduate level and beyond.

For the purpose of the Program Solicitation, bioengineering and bioinformatics are considered in their broadest sense. We welcome innovative proposals from all areas related to bioengineering and bioinformatics. Traditionally, this would include, but is not limited to, the following areas: tissue engineering, biomaterials, drug delivery systems, implant sciences, biosensors, platform technology development,

computational modeling, algorithm development, medical imaging, and image analysis. New areas that would benefit from the significant value added of applying the technologies and methods of bioengineering and bioinformatics include, but are not limited to, the dynamics of complex physical and/or chemical systems, biomimetic systems, systems that demonstrate emergent behavior, genomics, systems biology, biodiversity, and ecology. These are examples for illustrative purposes only and should not be interpreted as all-inclusive. Cyberinfrastructure is increasingly becoming useful as a tool to enhance teaching and research and to provide access to resources that would otherwise not be available at some institutions. We encourage, but do not require, the use of cyberinfrastructure in these programs, especially to continue the learning process during the academic year for students who have completed their first summer of research training and have been appointed to pursue a second summer of research training at the same Summer Institute.

Please see the report from the NSF Blue-Ribbon Advisory Panel on Cyberinfrastructure http://www.cise.nsf.gov/sci/reports/atkins.pdf for a discussion of how cyberinfrastructure promises to revolutionalize the kinds of problems that may be taken on as well as the manner in which they are pursued.

Cognizant Program Officer(s):

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

- 47.074 --- Biological Sciences
- 47.070 --- Computer and Information Science and Engineering
- 47.076 --- Education and Human Resources
- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences

Eligibility Information

- **Organization Limit:** U.S. academic institutions of higher education may apply.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** An institution may submit only one proposal as a lead institution.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 12 to 15 - Up to 15, 3-year or 4-year awards will be made. Awards to previous BBSI grantees will be made for 3 years only.

- **Anticipated Funding Amount:** $2,000,000 A combined anticipated total of up to $2,000,000 from NSF and NIBIB in FY 2006 pending the availability of funds.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from 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 by NSF.
- **Indirect Cost (F&A) Limitations:** Maximum indirect cost allowed is 8% of total Direct Costs, excluding equipment.
- **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. submitter's local time):
  November 29, 2005

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 National Science Foundation and the National Institute of Biomedical Imaging and Bioengineering (NIBIB) of the National Institutes of Health (NIH) have identified bioengineering and bioinformatics as essential, enabling fields to advance biological and physical sciences research. The agencies will continue collaborating on an important high-impact effort to train a cadre of students knowledgeable and skilled in bioengineering and bioinformatics. The purpose of this program is to provide undergraduate and early-stage graduate students majoring in the biological sciences, computer sciences, engineering, mathematics, or physical sciences with interdisciplinary bioengineering or bioinformatics research and education experiences in active 'Summer Institute', which are expected to increase the number of individuals deciding to pursue graduate careers in bioengineering and bioinformatics.

For the purpose of the Program Solicitation, bioengineering and bioinformatics are considered in their broadest sense. We welcome innovative applications from all areas related to bioengineering and bioinformatics. Traditionally, this would include, but is not limited to, the following areas: tissue engineering, biomaterials, drug delivery systems, implant sciences, biosensors, platform technology development, computational modeling, algorithm development, medical imaging, and imaging analysis. New areas that would benefit from the significant value added of applying the technologies and methods of bioengineering and bioinformatics include, but are not limited to, the dynamics of complex physical and/or chemical systems, biomimetic systems, systems that demonstrate emergent behavior, genomics, systems biology, biodiversity, and ecology. These are examples for illustrative purposes only and should not be interpreted as all-inclusive. Cyberinfrastructure is increasingly becoming useful as a tool to enhance teaching and research and to provide access to resources that would otherwise not be available to some institutions. We encourage, but do not require, the use of cyberinfrastructure in these programs, especially to continue the learning process during the academic year for students who have completed their first summer of research training and have been appointed to pursue a second summer of research training at the same Summer Institute.

The NSF Web Site is located at: http://www.nsf.gov.

The NIBIB Web Site is located at: http://www.nibib.nih.gov.

II. PROGRAM DESCRIPTION

Annually, every Bioengineering and Bioinformatics Summer Institute will provide a combined total of approximately 15 undergraduate and graduate students with:

1. didactic training experiences combining high quality formal course work with state-of-the art research seminars to provide students with an interdisciplinary foundation in the fundamentals of bioengineering or bioinformatics, and allied sciences, as required; and

2. associated interdisciplinary bioengineering and bioinformatics research experiences that include mentored research experience in appropriate research facilities and access to professional development opportunities.

Students will be encouraged to participate in an Institute for up to two consecutive summer programs. The use of cyberinfrastructure to support BBSI activities is encouraged.

The Bioengineering and Bioinformatics Summer Institutes will reach broadly into the national student talent pool as they seek to attract a diverse group of U.S. citizens and permanent residents to careers in bioengineering and/or bioinformatics. Fifty percent or more of the student participants in each Summer Institute must come from outside the host institution. The participants are expected to be evenly divided between those majoring in biology and in the broad areas of bioengineering or bioinformatics. NSF and NBIB are particularly interested in ensuring the full participation of women, under-represented minorities (African-Americans, Hispanic-Americans, Native-Americans, Alaskan Natives, Native Hawaiians and Pacific-

Islanders) and persons with disabilities in this program.

III. ELIGIBILITY INFORMATION

Eligible Institutions: Eligibility is limited to U.S. academic institutions that have strong interdisciplinary research programs that are responsive to the goals of this Program Solicitation and a training infrastructure to support the didactic part of the summer program.

Eligible Student Participants: Students must be U.S. citizens or permanent residents of the United States or its possessions. Undergraduate students must have completed their sophomore year and graduate students must be within the first two years of entry into their graduate program. An undergraduate student is a student enrolled in a degree program (part-time or full-time) leading to a baccalaureate. Students who have received associate degrees and are transferring from one institution to another but are enrolled at neither institution during the intervening summer are eligible to participate.

IV. AWARD INFORMATION

Anticipated Funding Amount: A combined anticipated total of up to $2,000,000 from NSF and NIBIB in FY 2006 pending the availability of funds. It is anticipated that up to 15 standard or continuing grants will be made in FY 2006 for programs to begin in the summer of 2006. Each Bioengineering or Bioinformatics Summer Institute may receive NIBIB-NSF support of up to a total (direct plus indirect cost) of $150,000 per year for up to four years. It is expected that not all awards will receive the maximum amount; the size of awards will depend upon the type of program proposed. Awards will be made for three or four years. Funding for each year will be contingent upon progress and 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/publications/pub_summ.jsp?ods_key=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 deviate from the standard GPG guidelines.

Cover Sheet. To properly identify your proposal, select the program solicitation number from the pull-down list. The title of the project must begin with the words: "BBSI".

Information about Principal Investigator. This form is automatically generated by FastLane. A single individual should be designated as Principal Investigator. This individual will be responsible for overseeing all aspects of the award. NSF allows one Principal Investigator and up to 4 co-Principal Investigators on each grant. Other anticipated collaborators should be listed as Senior Personnel.

Project Summary. (1-page limit) Provide a description of the activities that would result if the proposed Summer Institute were funded, including comments on the Institute objectives, number of participating students, and intended impact. The summary should include the following information: name of the host institution/organization; the major focus (bioengineering or bioinformatics) that describes the proposed Institute; a project title that permits prospective students to identify the focus of the site; number of summer weeks on site; name, telephone number and email address of the point-of-contact for student recruitment; and a Web address for site information.

The Project Summary must explicitly address the project's Intellectual Merit and Broader Impacts in separate statements, otherwise the proposal will be returned without review.

Project Description. The Project Description must contain the following items and may not exceed 15 pages in length:

OVERVIEW- Provide a brief description of the proposed Summer Institute objectives, targeted student participants, intellectual focus, organizational structure, timetable, and institutional commitment. The proposed programs should have three elements as described below. While the major focus of the program is on the didactic training and research experience, the proposal should adequately address plans for professional growth of the students. If cyberinfrastructure will be supporting BBSI activities, its use should be described where appropriate.

NATURE OF DIDACTIC AND LEARNING ACTIVITIES- Proposals should describe the formal course work and research seminars to be provided. The proposed curriculum should provide students/trainees with sufficient knowledge to understand the fundamentals of bioengineering or bioinformatics. Research seminars should expose Institute students/trainees to state-of-the-art research opportunities and challenges, and should provide students/trainees with a variety of perspectives in which their disciplines intersect with bioengineering or bioinformatics.

THE RESEARCH EXPERIENCE- Proposals should describe the experience and research track record of the principal investigator, the faculty who may serve as research mentors, and the institution. Examples of interdisciplinary bioengineering or bioinformatics research projects in which students will be involved and that build upon their didactic learning experiences should be provided. Each student/trainee should make a formal presentation on his/her research project toward the end of each summer program.

PROFESSIONAL DEVELOPMENT- Proposals must present plans that will ensure the development of student/faculty interaction and student/student communication. Development of collegial relationships and interactions is an important aspect of the Institute opportunity. Describe plans to ensure involvement of a diverse group of mentors who are adequately prepared to provide effective mentoring and a nurturing environment for participating students. Proposals should describe plans to provide career counseling to students, including what is required to successfully transition from undergraduate to graduate status, information about various fellowship opportunities and other career goals and opportunities.

STUDENT RECRUITMENT AND SELECTION- The overall quality of the student recruitment and selection processes and criteria will be an important element in proposal evaluation. The recruitment plan should describe the types and/or names of institutions where students will be recruited and the efforts made to attract students from under-represented groups (women, minorities, persons with disabilities). Fifty percent or more of the student participants must come from outside the host institution. The participants are expected to be evenly divided between those majoring in the biological sciences and in the broad areas of bioengineering or information sciences. Student participants must be citizens or permanent residents of the United States.

OUTREACH TO UNDERREPRESENTED POPULATIONS- Proposers must include a specific plan to establish relationships with different types of institutions that serve underrepresented and under-served populations to increase recruitment and participation of students from these groups in the Summer Institutes. In addition, all competing continuation proposals must include a report on the recruitment and retention of underrepresented minorities during the previous award period. Resources for developing these plans may include the following: Department of Education Website: http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html

PROJECT EVALUATION AND REPORTING- The proposal must describe a plan for evaluation of the proposed project during and after the award, including such matters as: measures to be employed to gauge success (e.g. GPA, SAT or GRE scores etc.): mechanisms for assessment of the project by participants, faculty and administrative observers; follow-through plans to promote continuation of student interest and involvement in bioengineering or bioinformatics; plans for tracking participants after they complete the experience, etc. Projects will be required to provide data and relevant qualitative information to the NSF-NIBIB third-party evaluation of the entire BBSI program effort. It is expected that proposers consider assessing expectations before students begin the program and after they complete the program to determine whether they are more likely to pursue graduate careers in bioengineering and/or bioinformatics.

CYBERINFRASTRUCTURE- Cyberinfrastructure may be defined as the integrated computing, information and communication infrastructure. More broadly, it includes the physical equipment and software tools that allow enhanced collaboration over distance, time and disciplines. In addition, cyberinfrastructure enables the inclusion of people who, because of physical capabilities, location, or history, have been previously excluded from activities at the frontiers of scientific and engineering research and education. The use of Cyberinfrastructure is not required. If cyberinfrastructure is to be used in support of BBSI activities, please

discuss how its application is appropriate and likely to be effective.

RESULTS FROM PRIOR NSF SUPPORT - The proposers who were previously funded through the BBSI Program must submit a report that addresses the following: Number of applications received and number of applicants selected; demographics of appointees such as home university; gender; racial/ethnic status; major in college; examples of the types of research projects students were involved in; who were the mentors and a description of the mentoring process; descriptions of didactic training and career development activities; etc., where students are following completion of the program, student publications, and what program changes were made as a result of feed-back evaluation.

Current BBSI grantees will be allowed only three years of support to commence on or after September 1, 2007 and contingent upon successful completion and evaluation of the Final Report of their current BBSI grant. In the Results from Prior NSF Support section, proposals from current BBSI grantees should also describe the earlier BBSI project(s), their outcomes, ongoing progress and lessons learned. If appropriate indicate how these serve as a base for or will be incorporated into the proposed project. Include specific outcomes for students; the interest and contributions of faculty and administrators including those that are not members of the leadership team; and a summary of the supporting infrastructure.

IMPACT ON FIELD AND ON BROADENING PARTICIPATION- Indicate the project's potential as a national model and as contributor to research on bioengineering and bioinformatics graduate education. Indicate how your project is broadening the diversity of students and participation of underrepresented minorities and women in graduate education.

Project Budget. The proposal must include a detailed project budget and budget justification, as described in the GPG. The budget justification (not to exceed 3 pages) should explain and justify major cost items and any unusual situations/inclusions. Costs may include such items as faculty salaries and participant stipends, housing, travel, or laboratory supplies. Costs to defray one-day trips per year for the PIs to the Washington, DC area during the grant period should be included. Travel and per diem costs for up to four outside scientists and engineers and four BBSI students to present seminars on state-of-the-art topics may be included. Honoraria are not allowed. As a guide, student stipends are expected to be consistent with the academic institution’s stipends for students at a similar educational level but not less than $300/week for undergraduate students and $500/week for graduate students. All student costs should be entered on line F under participant support costs. An appropriate level of stipend support for students to participate in research projects at their home institutions during the year may be included.

Proposers are reminded to identify the program announcement/solicitation number (05-611) 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 by NSF in proposals submitted under this Program Solicitation.

Indirect Cost (F&A) Limitations:

Maximum indirect cost allowed is 8% of total Direct Costs, excluding equipment.

Other Budgetary Limitations:

The Principal Investigators of all grants awarded under this solicitation are expected to attend annual grantee meetings in the Washington, DC area during the course of the project. On occasions, a subset of BBSI students may also be invited to attend the annual meetings. The travel cost associated with these meetings should be included in their budget.

C. Due Dates

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

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

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: https://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:

Didactic Training: Will the didactic training experience provide the students with high quality formal course work and research seminars? Will it provide an interdisciplinary foundation in the fundamentals of bioengineering or bioinformatics?

Research Experience: Does the program provide students the opportunity to build on the didactic experience through interdisciplinary research projects that involve the students in the creativity of the research process? Are the example topics proposed for the research seminars interdisciplinary, and at the forefront of the interface of disciplines contributing to bioengineering or bioinformatics?

Mentoring: Is there an effective program for mentoring that has a high probability of resulting in career paths in bioengineering or bioinformatics and enrollments in graduate programs by the participating students? Is there a diverse group of adequately prepared mentors?

Recruitment: Are the plans for recruiting adequate to ensure inclusion of women, underrepresented minorities and persons with disabilities as Institute participants? Specifically, is the outreach plan to institutions serving underrepresented populations sufficient to increase participation of individuals from these groups?

Cyberinfrastructure: If cyberinfrastructure is to be used in support of BBSI activities, is its application appropriate and likely to be effective?

Evaluation Plan: Is there an evaluation plan and tracking program to determine the effectiveness of the program and assess outcomes and impacts?

For Competing Proposals Only: Did the program recruit individuals with the appropriate expertise? Was the research program matched to the needs of the students? How effective/appropriate was the didactic training? How comprehensive were the career development activities? How effective was the mentoring process? How many students ended up pursuing graduate training in bioengineering or bioinformatics? How many students ended up pursuing graduate training in bioengineering or bioinformatics, as compared to before they participated in BBSI?

Research involving Human Subjects: If students are going to be engaged in research involving human participants, NIBIB and NSF require institutional approval and appropriate plans for the recruitment and retention of subjects (see http://grants.nih.gov/grants/funding/phs398/HumanSubjects.pdf and http://www.nsf.gov/bfa/dias/policy/docs/45cfr690.pdf.

Budget: Is the proposed budget appropriate and are indicated expenses justified in meeting the goals of the

program?

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

Integration of Research and Education as described above.

Integrating Diversity into NSF and NIBIB Programs, Projects, and Activities: Broadening opportunities and enabling the participaton of all citizens--women and men, underrepresented minorities, and persons with disabilities--is essential to the health and vitality of science and engineering. NSF and NIBIB are committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Proposals submitted in response to this solicitation will be reviewed by a multidisciplinary panel including experts from the fields of biology, computer science, engineering, mathematical and physical sciences, and relevant health disciplines.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF/NIBIB who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Panel Review. The NIBIB will play an active part by suggesting reviewers and by participating in discussions regarding funding decisions.

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 proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. 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 an 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 are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC). 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/awards/managing/. Paper copies of these documents 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/publications/pub_summ.jsp?ods_key=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:

- Sohi Rastegar, Program Director, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-5379, fax: (703) 292-9051, email: srastega@nsf.gov
- Henry Khachaturian, Ph.D., NIH/NIBIB, 6707 Democracy Boulevard, Suite 200, MSC 5477, Bethesda, MD, 20892-5477, telephone: 301-451-4772, fax: 301-480-1614, email: hk11b@nih.gov
- Mary F. Poats, Program Manager, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-5357, fax: (703) 292-9051, email: mpoats@nsf.gov
- C. Denise Caldwell, Program Director, Directorate for Mathematical & Physical Sciences, Division of Physics, 1015 N, telephone: (703) 292-7371, fax: (703) 292-9078, email: dcaldwel@nsf.gov
- Lloyd E. Douglas, Program Director, Directorate for Mathematical & Physical Sciences, Division of Mathematical Sciences, 1025 N, telephone: (703) 292-4862, fax: (703) 292-9032, email: ldouglas@nsf.gov
- Debasish Dutta, Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-5304, fax: (703) 292-9048, email: ddutta@nsf.gov
- Christopher L. Greer, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, 615 N, telephone: (703) 292-8470, fax: (703) 292-9063, email: cgreer@nsf.gov
- Bruce K. Hamilton, Division Director, Directorate for Engineering, Division of Bioengineering & Environmental Systems, 565 S, telephone: (703) 292-8320, fax: (703) 292-9098, email: bhamilto@nsf.gov
- Charles D. Pibel, Program Officer, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4971, email: cpibel@nsf.gov
- Sylvia Spengler, Program Director, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 N, telephone: (703) 292-8936, fax: (703) 292-9073, email: sspengle@nsf.gov
- G. Bruce Taggart, Program Director, Directorate for Mathematical & Physical Sciences, Division of Materials Research, 1065 N, telephone: (703) 292-4941, email: gtaggart@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane help: Mary Poats, NSF, telephone: 703-292-5357, email: mpoats@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 MyNSF News Service (http://www.nsf.gov/mynsf/) to be notified of new funding opportunities that become available.

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. 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 and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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