# Ethics Education in Science and Engineering  (EESE)

## Program Solicitation
**NSF 08-530**

*Replaces Document(s):*
**NSF 07-541**

**National Science Foundation**

Directorate for Social, Behavioral & Economic Sciences
   Division of Social and Economic Sciences

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

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

April 03, 2008

March 02, 2009

March 01, 2010

## SUMMARY OF PROGRAM REQUIREMENTS

### General Information

**Program Title:**

Ethics Education in Science and Engineering  (EESE)

**Synopsis of Program:**

The Ethics Education in Science and Engineering (EESE) program accepts proposals for research and educational projects to improve ethics education in all of the fields of science and engineering that NSF supports, especially in interdisciplinary or inter-institutional contexts.  Proposals must focus on improving ethics education for graduate students in those fields, although the proposed programs may benefit advanced undergraduates in addition to graduate students.

**Cognizant Program Officer(s):**

- Laurel Smith-Doerr, Program Director, Directorate for the Social, Behavioral and Economic Sciences, Science,

Technology and Society Program, 995N, telephone: (703) 292-8543, email: lsmithdo@nsf.gov

- Myles Boylan, Acting Division Director, Directorate for Education and Human Resources, Division of Graduate Education, 835 N, telephone: (703) 292-4617, fax: (703) 292-9015, email: mboylan@nsf.gov

- Tom Carruthers, 1015 N, telephone: (703) 292-7373, email: tcarruth@nsf.gov

- Ephraim Glinert, Program Director, Directorate for Computer and Information Science and Engineering, Human Centered Computing Cluster, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: eglinert@nsf.gov

- Elmima Johnson, Program Director, Directorate for Education and Human Resources, Division of Research and Learning, 855 S, telephone: (703) 292-5137, fax: (703) 292-9046, email: ejohnson@nsf.gov

- Jill Karsten, Program Director for Diversity and Education, Directorate for Geosciences, 705 N, telephone: (703) 292-7718, fax: (703) 292-9042, email: jkarsten@nsf.gov

- Susan C. Kemnitzer, Deputy Division Director, Directorate for Engineering, Engineering Education and Centers Division, 585 N, telephone: (703) 292-5347, email: skemnitz@nsf.gov

- Carter Kimsey, Program Manager, Directorate for Biological Sciences, 615 N, telephone: (703) 292-8470, fax: (703) 292-9063, email: ckimsey@nsf.gov

- John Regalbuto, Directorate for Engineering, Catalysis and Biocatalysis Program, 525 N, telephone: (703) 292-8371, fax: (703) 292-9054, email: jregalbu@nsf.gov

- Sylvia Spengler, Program Director, Directorate for Computer and Information Science and Engineering, Information Integration and Informatics cluster, 1125 N, telephone: (703) 292-8930, email: sspengle@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources

## Award Information

**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** 6 to 12

**Anticipated Funding Amount:** $2,400,000 subject to the availability of funds

## Eligibility Information

**Organization Limit:**

Proposals may only be submitted by the following:

- Only colleges and universities located and accredited in the U.S. or U.S.-based professional associations are eligible to apply to this program. Other types of organizations can be included only as non-lead collaborators or sub-awardees. In addition, accredited U.S. colleges and universities and U.S. professional associations can be non-lead collaborators or sub-awardees.

**PI Limit:**

NSF expects project teams to include persons with appropriate expertise. This might include expertise in the domain or domains of science or engineering on which the project focuses, in ethics, in educational research, and in pedagogy.

**Limit on Number of Proposals per Organization:**

An eligible organization, as defined above, may submit only one proposal as the lead organization. Organizations submitting more than one proposal as the lead organization will be notified and given one week from notification to select one proposal for consideration. If one is not selected in that time period, all of those proposals will be returned without review. There is no limit on the number of proposals under which an organization may be included as a non-lead collaborator or sub-awardee.

**Limit on Number of Proposals per PI:**

None Specified

## Proposal Preparation and Submission Instructions

**A. Proposal Preparation Instructions**

- **Letters of Intent:** Not Applicable

- **Preliminary Proposal Submission:** Not Applicable

- **Full Proposals:**

    - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. 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.

    - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf)

**B. Budgetary Information**

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.

- **Indirect Cost (F&A) Limitations:**  Not Applicable

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

**C. Due Dates**

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

    April 03, 2008

    March 02, 2009

    March 01, 2010

## Proposal Review Information Criteria

**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 21st Century finds science and engineering facing increasingly complex and encompassing ethical and social issues. Science and engineering practices are also increasingly interdisciplinary and operate in many organizational and societal contexts. Many professional associations are involved in developing codes of ethics, hosting conferences on ethical problems in research practice, or exploring relationships among science, engineering, and society. This diversity of interests creates a need for connections among the range of fields, disciplines, organizations, and situations in which these ethical concerns arise.

Prior research and educational activities related to ethics, supported through the National Science Foundation and other Federal and private agencies and organizations, provide a background from which to develop relevant theory and methods to improve ethics education in science and engineering and to provide better resources for organizations concerned with ethics in these fields. Building on the Foundation's prior support for ethics-related research and program development, the NSF Directorates for: Biological Sciences; Computer and Information Science and Engineering; Education and Human Resources; Engineering; Geosciences; Mathematical and Physical Sciences; and Social, Behavioral and Economic Sciences have joined together to continue the Ethics Education in Science and Engineering (EESE) program.

Results of the EESE program will contribute to resources that institutions may utilize in complying with Sec 7009 of the America COMPETES Act (H.R. 2272), which requires institutions to "provide appropriate training oversight in the responsible and ethical conduct of research."

## II. PROGRAM DESCRIPTION

Ethics education in science and engineering encompasses many issues and many constituencies, including: pre-college; undergraduate; graduate and postdoctoral students; junior and tenured faculty; technicians and administrators; and practicing scientists and engineers outside academe. Ethics education has implications for the institutions in which all of these individuals and groups study and work, as well as for other organizations and associations. Ethics issues arise in the practice of science and engineering as well as in the complex relationships among science, engineering, technology and society. To address this variety of issues and constituencies, educational practice needs to draw from relevant research, including work in practical and professional ethics and theory of action, pedagogical theory, and appropriate theory and knowledge from social and behavioral sciences.

The Ethics Education in Science and Engineering (EESE) program accepts proposals for research and educational projects to improve ethics education in all of the fields of science and engineering that NSF supports, including within interdisciplinary or inter-institutional contexts.  Proposals must focus on improving ethics education for graduate students in those fields or on developing summer post-baccalaureate ethics-education activities or other activities that transition students from undergraduate to graduate education.  The program will entertain proposals in graduate ethics education in science and engineering generally.  However, the program is particularly interested in proposals addressing issues of cultural relativity in research that is conducted in an international context and those addressing intellectual property issues, including scientific publishing. In these contexts, faculty and graduate students may find that they lack applicable standards or that the standards they are accustomed to do not match those of others with whom they interact (perhaps more so when international projects are interdisciplinary). Public concerns or challenges may also raise questions that need careful consideration (for example, with respect to real or perceived conflicts of interest or where human subjects are involved).  The program also encourages proposals addressing intellectual property rights including scientific publishing, appropriate attribution, access to scientific data, and university-industry collaborations.

There are numerous candidates for issues or themes on which to focus. A good example is concern for privacy. Researchers in the natural and physical sciences, the social and behavioral sciences, and engineering all grapple with this issue in their research. The issue of privacy arises in field studies of populations and laboratory studies of individuals. It arises in the design of computer systems and engineering artifacts. One of the questions might be how has graduate education incorporated, or how might it better incorporate, attention to privacy concerns? How do graduate students, postdoctoral fellows, and faculty identify the relevant questions and address them? Are there examples of best practices?

Another example might involve a focus on new developments in science and engineering. In emerging areas of biotechnology or nanotechnology, for instance, can relevant ethical questions be identified and examined in an intellectually engaging and broadly adaptable fashion? How does attention to ethical questions and standards for practice diffuse through graduate curricula? Can the diffusion be improved?

Similar questions can be raised in relation to enduring ethical concerns related to graduate training in a scientific or engineering discipline, or in an interdisciplinary research area. In the biological or environmental sciences, for example, issues of ethics and animal research as well as issues of ecological ethics arise. These fields, as well as numerous others including chemistry, engineering and computer science, have a history of ethical concern about biological warfare that takes a new slant with threats from bioterrorism. Neuroethics is a new orientation towards perennial questions about human freedoms and responsibilities; in addition to biological and cognitive scientists, the field requires collaborations with other disciplines. Questions about human responsibility and global environmental change pose ethical issues for scientific and engineering training in many disciplines including the atmospheric and ocean sciences.

EESE is interested in encouraging innovative education and research projects likely to create long-term improvement in ethics education for graduate students in science and engineering. **EESE invites proposals for research projects, education projects, and combinations of the two.**  It encourages applicants who are thinking creatively about ethics education, going well beyond standard approaches like providing students with a series of scenarios and having a discussion about them, or holding workshops and seminars with invited speakers, and then asking students to rate the activities on a survey form.

**Education projects** must be based on research findings that indicate successful ways to enhance ethics education for graduate students. They may include a wide range of activities such as mentoring programs, infrastructure-development activities, faculty capacity-building activities, training of postdoctoral fellows to implement programs, and graduate-student involvement in program development. Additionally, an example of such a context would be educating students with diverse cultural backgrounds.  Projects to develop and test new materials or tools or teaching techniques are also eligible. Web-based modules that do not significantly advance the practice of ethics education are unlikely to be competitive.

A common, often-effective approach in educational projects is to develop graduate-student programs. Another approach may focus on improving the ability of faculty to mentor students or create ethics-education programs and materials in collaboration with graduate students. A national training activity for graduate students or development and testing of a national interactive electronic resource would be yet another appropriate strategy.

EESE education projects should test the feasibility and effectiveness of their activities or programs in more than one institution, incorporate ways to diffuse project activities even further, and evaluate project effectiveness, including assessment of expected student outcomes. Proposals are expected to include substantial and persuasive information about how this will be done. Proposals should specify plans to disseminate findings widely. Collaborations with appropriate professional associations are encouraged in this regard.

**Research projects** that examine ethics education for graduate students in science and engineering are also eligible for consideration in EESE. Proposals should build on earlier relevant research in ethics or other relevant fields, and add to the research base. Research projects should suggest and explore creative, original, or potentially transformative concepts. Projects can include qualitative and/or quantitative approaches. The expectation is that project results will help in developing better ethics-education programs for graduate students; thus, proposals should specify plans to deliver findings to appropriate research and educational communities and assist them to implement projects or programs based on the findings. Research projects may also include a focus on ethical issues arising in educational research or in ethics education for graduate students. An example of such a context would be educating students with diverse cultural backgrounds.

*Interdisciplinary partnerships* among researchers in natural sciences and engineering and experts in social sciences, humanities, and education are strongly encouraged. Such collaborations will help to develop the theoretical and intellectual basis for training programs more carefully.

**Proposals may also combine research and education components.** For instance, the first year of a project might examine ethics education for graduate students in a scientific or engineering field. The second year might implement programs on several campuses based on what was discovered. Repetition and modification, evaluation and diffusion might occur during the third year.

**Note:** NSF does not consider proposals for medical research. The EESE program will not consider proposals focused on ethics for medical students or in medical education. EESE will not consider proposals that will start or provide incremental improvements to formal or informal educational activities responsive to Federal mandates for research integrity or human-subjects training requirements.

## III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. The maximum award amount is expected to be $300,000. Collaborative proposals for the purpose of disseminating best practices in graduate ethics education will be eligible for a maximum award amount of $400,000 (for example, projects that include partnerships between universities and scientific or engineering societies). Anticipated funding amount is $2.4 million for an estimated 6 to 12 Standard Grants. The maximum award duration is expected to be 36 months.

## IV. ELIGIBILITY INFORMATION

**Organization Limit:**

Proposals may only be submitted by the following:

- Only colleges and universities located and accredited in the U.S. or U.S.-based professional associations are eligible to apply to this program. Other types of organizations can be included only as non-lead collaborators or sub-awardees. In addition, accredited U.S. colleges and universities and U.S. professional associations can be non-lead collaborators or sub-awardees.

**PI Limit:**

NSF expects project teams to include persons with appropriate expertise. This might include expertise in the domain or domains of science or engineering on which the project focuses, in ethics, in educational research, and in pedagogy.

**Limit on Number of Proposals per Organization:**

An eligible organization, as defined above, may submit only one proposal as the lead organization. Organizations submitting more than one proposal as the lead organization will be notified and given one week from notification to select one proposal for consideration. If one is not selected in that time period, all

of those proposals will be returned without review. There is no limit on the number of proposals under which an organization may be included as a non-lead collaborator or sub-awardee.

**Limit on Number of Proposals per PI:**

None Specified

# V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

## A. Proposal Preparation Instructions

**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program 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. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

Applicants should read carefully the Introduction, Program Description, and Additional Review Criteria sections of this solicitation, to ensure that their proposals are responsive to program requirements.  In addition, they should attend to the following instructions:

The brief **project summary** must describe the goals and methods of the project.  It should indicate at the beginning whether the proposal is for an education project or a research project, or a combination of the two.  It should contain specific paragraphs with headings on the Intellectual Merit and Broader Impacts of the project.  National Science Board policy demands that proposals that do not discuss these two criteria explicitly be returned without review.

The **project description** must include:

1. *a project rationale.*  This should include a synopsis of the research literature or findings on which the project will draw, or which it will test, with appropriate citations. Education projects should briefly document current practices in ethics education at the proposing institution(s).

2. *a project plan.* For education projects, this should include the overall project goals, methods, strategies, recruitment and activities; plans for testing project results at more than one institution; and plans for evaluation and assessment. For research projects, this should include a description of the research question(s) to be investigated and the possible impact of findings on ethics education for graduate students in science or engineering, and a research plan describing methods and activities appropriate to answering the research question(s).

3. *an evaluation plan, for education and combined education/research projects only.* This should include a description of how the effectiveness of the proposed education project will be measured, including the criteria and indicators that will be used. Researchers may consult The 2002 User-Friendly Handbook for Project Evaluation.

4. *a list of key personnel.* This should include descriptions of the duties and responsibilities of senior personnel and any others critical to project success. Projects may involve diverse sets of participants. Project teams will usually include faculty with disciplinary or transdisciplinary content expertise, ethics expertise, and expertise in educational methodologies or pedagogy. Biographical sketches and letters of commitment should be provided for all key senior personnel, collaborators, consultants, and others playing substantive roles in the project. Graduate students should be involved as project assistants as well as recipients of program activities or subjects of research. Projects that develop activities involving underrepresented groups in science and engineering are particularly encouraged. Discussion of prior related work of the PI(s) should include results of previous funding.

5. *a project management plan.* A description, table, or diagram should specify project tasks, completion dates, and identify the responsible personnel should be included. A monthly schedule with indications, for example, of meetings of project personnel or scheduled student seminars, helps to demonstrate that the plan is well thought out.

6. *appropriate plans for dissemination of results.* This should include plans for assistance to relevant research and educational communities in their adoption and adaptation. All projects must have a dissemination plan to deliver findings to professional peers and appropriate research and educational communities. Applicants should provide detailed information about how models or findings from the projects will be diffused and assistance provided in their adoption or adaptation, as appropriate. All projects are expected to make resources developed through the EESE program accessible online through such portals as the National STEM Digital Library.

7. *a list of any partnering organizations.* The roles of any cooperating organizations or institutions should be described. All proposals should include letters from any project partners or cooperating organizations, and from research or educational program sites, documenting collaborative arrangements. These letters should be provided in the Supplementary Documentation section of the proposal.

8. *sustainability plan.* Education projects should describe how the ethics education activities will be continued after the grant period. Letters of support from institution(s) will be accepted if administrators describe in detail how the longer-term institutionalization of EESE activities will occur (for example, if a newly required course will be added to the catalog).

**An important reminder about research with human subjects:** Research involving human subjects must either have approval from the organization's Institutional Review Board (IRB) before issuance of an NSF award, or identify the applicable subsection exempting the proposal from IRB review. This requirement is in the Common Rule (Federal Policy for the Protection of Human Subjects, 45 CFR Section 690). See the NSF Grant Proposal Guide for more details. The NSF proposal cover sheet requires provision of the relevant information, as appropriate.

**Other General Information**

Experience indicates that proposals do better in review if they include specific information on such components as how often project team meetings are scheduled, how many seminars or other educational activities are expected to occur, who is responsible for what aspects of the project, and how project success will be gauged. Strong proposals specify the pedagogical standards that will be used in project activities and assessment. They involve graduate students as assistants for the project. As appropriate, they address plans to integrate teaching and research and to modify the project as needed.

EESE will not accept videotapes, diskettes, textbooks, CD-ROMs, or any other materials as part of proposal packages.

Investigators wishing to apply for support are encouraged to discuss their ideas with one of the contacts listed in the solicitation.

## B. Budgetary Information

**Cost Sharing:** Cost sharing is not required under this solicitation.

**Other Budgetary Limitations:**

The maximum award amount is expected to be $300,000 inclusive of indirect costs; maximum duration is expected to be 36 months. Projects that include partnerships (for example, between universities and scientific societies) for the purpose of disseminating best practices in graduate ethics education will be eligible for a maximum award amount of $400,000.

**Budget Preparation Instructions:**

Funds for the principal investigator or an appropriate designee to attend two meetings, at NSF or another appropriate venue, for discussion and interaction with other awardees, must be included.

## C. Due Dates

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

    April 03, 2008

    March 02, 2009

    March 01, 2010

## D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of 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 solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

  *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. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

  Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: http://www.grants.gov/CustomerSupport. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

  *Submitting the Proposal:* Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

## VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

## A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. 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 the reviewer is qualified to make judgements.

**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, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

NSF staff also 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:**

Reviewers will be asked to apply several special criteria to all proposals in this program:

1. Is this an innovative effort? Is it likely to create long-term improvement in ethics education for graduate students in science or engineering?

2. Does the project include adequate grounding in the relevant research literatures? Does it use appropriate methodology of evaluations? Does it include relevant interdisciplinary collaboration?

3. Do potential results have promise for broad utility, and is there a feasible plan for widespread dissemination, adoption or adaptation?

4. Are there adequate supporting materials to document commitment from those individuals and institutions playing a substantive role in the project?

For education proposals, and those combining research and education, additional special criteria are:

1. Does the proposal include appropriate plans to test results beyond one institution?

2. Does the proposal include well-formulated, feasible plans for evaluation of effectiveness?

## B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review 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.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. 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 deadline or target date, or receipt date, whichever is later.  The interval ends when the Division Director accepts the Program Officer's 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 Officer.  In addition, the proposer will receive an explanation of the decision to award or decline funding.

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 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.B. 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 (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 agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/general_conditions.jsp?org=NSF. 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 and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

## C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. 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.  Such reports provide information on activities and findings, project participants (individual and organizational) 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. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

## VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Laurel Smith-Doerr, Program Director, Directorate for the Social, Behavioral and Economic Sciences, Science, Technology and Society Program, 995N, telephone: (703) 292-8543, email: lsmithdo@nsf.gov

- Myles Boylan, Acting Division Director, Directorate for Education and Human Resources, Division of Graduate Education, 835 N, telephone: (703) 292-4617, fax: (703) 292-9015, email: mboylan@nsf.gov

- Tom Carruthers, 1015 N, telephone: (703) 292-7373, email: tcarruth@nsf.gov

- Ephraim Glinert, Program Director, Directorate for Computer and Information Science and Engineering, Human Centered Computing Cluster, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: eglinert@nsf.gov

- Elmima Johnson, Program Director, Directorate for Education and Human Resources, Division of Research and Learning, 855 S, telephone: (703) 292-5137, fax: (703) 292-9046, email: ejohnson@nsf.gov

- Jill Karsten, Program Director for Diversity and Education, Directorate for Geosciences, 705 N, telephone: (703) 292-7718, fax: (703) 292-9042, email: jkarsten@nsf.gov

- Susan C. Kemnitzer, Deputy Division Director, Directorate for Engineering, Engineering Education and Centers Division, 585 N, telephone: (703) 292-5347, email: skemnitz@nsf.gov

- Carter Kimsey, Program Manager, Directorate for Biological Sciences, 615 N, telephone: (703) 292-8470, fax: (703) 292-9063, email: ckimsey@nsf.gov

- John Regalbuto, Directorate for Engineering, Catalysis and Biocatalysis Program, 525 N, telephone: (703) 292-8371, fax: (703) 292-9054, email: jregalbu@nsf.gov

- Sylvia Spengler, Program Director, Directorate for Computer and Information Science and Engineering, Information Integration and Informatics cluster, 1125 N, telephone: (703) 292-8930, email: sspengle@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-

## IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at http://www.nsf.gov/mynsf/.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

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

- **To Order Publications or Forms:**

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  or telephone:        (703) 292-7827

- **To Locate NSF Employees:**        (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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; and 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 proposer 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 or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; 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," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records, " 69 Federal Register 26410 (May 12, 2004). 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 Office of Management and Budget (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 the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
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Arlington, VA 22230

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