Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP)

PROGRAM SOLICITATION
NSF 08-569

REPLACES DOCUMENT(S):
NSF 07-570

National Science Foundation

Directorate for Education & Human Resources
Division of Undergraduate Education

Letter of Intent Due Date(s) ***(optional)*** (due by 5 p.m. proposer's local time)***:***

August 19, 2008

August 18, 2009

August 17, 2010

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

September 30, 2008

September 29, 2009

September 28, 2010

IMPORTANT INFORMATION AND REVISION NOTES

Due dates for optional Letters of Intent and deadlines for Full Proposals are provided for 2008, 2009, and 2010.

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP)

Synopsis of Program:

The Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) seeks to increase the number of students (U.S. citizens or permanent residents) receiving associate or baccalaureate degrees in established or emerging fields within science, technology, engineering, and mathematics (STEM). Type 1 proposals are solicited that provide for full implementation efforts at academic institutions. Type 2 proposals are solicited that support educational research projects on associate or baccalaureate degree attainment in STEM.

Cognizant Program Officer(s):

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

- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 20 Type 1 awards and 1-3 Type 2 awards per year

Anticipated Funding Amount: $26,000,000 per year in FY 2009, FY 2010 and FY 2011 for new and continuing awards subject to availability of funds

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Type 1 proposals are invited from academic institutions in the United States and its territories, from consortia thereof, or from nonprofit organizations that have established consortia among such academic institutions. The academic institutions must offer either associate degrees or baccalaureate degrees in science, technology, engineering and/or mathematics (STEM). Associate degree-granting institutions with a demonstrated record of articulation to STEM baccalaureate programs need not necessarily grant associate degrees in STEM fields in order to be eligible for this program.

  Projects may involve a single institution, collaboration with business and industrial partners, or collaboration among several institutions. For example, projects may include collaborative efforts that improve the transition of students among the collaborating institutions, such as transfer between two- and four-year institutions.

  Type 2 proposals are invited from any individual or organization eligible to submit proposals to the NSF.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

An institution that awards baccalaureate degrees is allowed to submit only one Type 1 proposal, or to be part of only one consortium submitting a Type 1 proposal. An institution that awards associate degrees, and does not award baccalaureate degrees, is allowed to be the lead institution on only one Type 1 proposal, and, in addition, may be a partner on one or more Type 1 proposals. There are no restrictions on the number of Type 2 proposals that an individual or organization may submit.

Limit on Number of Proposals per PI:

See Limit on Number of Proposals per Organization

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard NSF Proposal and Award Policies and Procedures Guide, Part I: 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 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

- **Letter of Intent Due Date(s)** ***(optional)*** (due by 5 p.m. proposer's local time)***:***

  August 19, 2008

  August 18, 2009

  August 17, 2010

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

  September 30, 2008

  September 29, 2009

  September 28, 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: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

Undergraduate education is central to the National Science Foundation's mission in human resource development. Whether preparing students to participate as citizens in a technological society, to enter the workforce with two- or four-year degrees, to continue their formal education in graduate school, or to further their education in response to new career goals or workplace expectations, undergraduate education provides the critical link between the Nation's secondary schools and a society increasingly dependent upon science and technology. Increasing the number of undergraduate students obtaining degrees in science, technology, engineering, and mathematics (STEM) fields will provide a workforce that is prepared to ensure a healthy economy, respond to demands for national security, and maintain and elevate the quality of life and standard of living in the United States through technological and scientific advancements. A Report from the National Science Board (NSB 03-69), "The Science and Engineering Workforce: Realizing America's Potential," recommends that in order to ensure the country's capacity in science and engineering in an increasingly competitive and changing global labor market, "The Federal Government and its agencies must step forward to ensure the adequacy of the US science and engineering workforce. All stakeholders must mobilize and initiate efforts that increase the number of US citizens pursuing science and engineering studies and careers." The Report further recommends that it is essential "to improve success in science and engineering study by American undergraduates from all demographic groups."

II. PROGRAM DESCRIPTION

All Type 1 Proposals

Program activities under the STEP Type 1 competition should be efforts aimed at adapting and implementing best practices that will lead to an increase in the number of students (United States citizens or permanent residents) obtaining STEM degrees at institutions with baccalaureate degree programs; or completing associate degrees in STEM fields or completing credits toward transfer to a baccalaureate degree program in STEM fields at community colleges. The goal of the project must be to increase the total graduation numbers of such students at the institution(s), and all STEP proposals must include specific numerical targets for these increases. If a project focuses efforts on only a subset of STEM fields, increases in those fields must not be at the expense of degrees in other STEM fields. Projects may focus on the retention and/or recruitment of undergraduate students into STEM fields. Outreach efforts are appropriate only if the efforts can be expected to result in additional STEM majors and graduates at the submitting institution(s) within the grant period.

All Type 1 projects are considered to be institutional efforts. A Type 1 proposal should be identified as falling into one of three categories: 1A, 1B, or 1C.

Type 1A

A Type 1A proposal is submitted by an institution that has not previously been the lead institution on a STEP Type 1 award.

Type 1B and 1C

Type 1B and Type 1C proposals are submitted by institutions that have previously been the lead institution on a STEP Type 1 award.

A Type 1B proposal is for a new five-year implementation project from an institution that previously has been the lead institution on a STEP Type 1 award. A Type 1B grant is not intended to simply continue efforts for which funding was provided under the original award. A Type 1B proposal must provide information about the previous Type 1 grant, including evaluation information that supports claims of successes that have been achieved, the degree to which the previous project has been institutionalized, a description of significantly new directions in which the project will be heading, the rationale for choosing these new directions, and the relationship between the previous project and the proposed project. At least four years of data about the effects of the previous STEP Type 1 grant on student enrollments and graduation rates in STEM must be provided.

A Type 1C proposal is for a follow-on grant to an institution or consortium that has been the lead on a STEP Type 1 award. The Type 1C proposal may request funds for 2 to 3 additional years of work, and may request up to a maximum of 50% of the support that was awarded under the original grant. Follow-on grants are designed to allow projects to pursue opportunities that arose as mid-course corrections or unforeseen related opportunities as a direct result of work under the original grant. Follow-on grants are not intended simply to continue efforts for which funding was provided under the original award, nor are they intended for undertaking significantly new or different efforts as would be the case under a Type 1B proposal. A Type 1C proposal is expected to provide significant information about the accomplishments to date under the project, including evaluation results for at least four years of efforts under the original award.

As examples, Type 1A, 1B, or 1C projects might propose a comprehensive effort that uses some combination of the following approaches in order to increase the number of graduates in STEM fields:

- Programs that intend to increase the number of students persisting in STEM courses and majors by focusing directly on the quality of student learning, including efforts that encourage (a) high-caliber teaching, including enabling faculty to spend additional time teaching participating students in smaller class settings, including in the laboratory environment; (b) opportunities to implement new pedagogical approaches such as the implementation of active learning strategies, web-based course strategies, distributed and collaborative digital teaching tools, or interactive course modules; and (c) training of teaching assistants;
- Programs that expand the capacity of institutions of higher education to incorporate current advances in science and technology into the undergraduate learning environment;
- Programs including interdisciplinary approaches to undergraduate STEM education;
- Bridge programs that enable students at community colleges to matriculate directly into baccalaureate STEM programs;
- Programs among collaborating academic institutions designed to increase the number of pathways available for achieving a degree in STEM, or to improve the articulation among programs at the institutions;
- Mentoring programs that involve faculty or peer student mentoring;
- Programs that focus on increasing enrollments in STEM undergraduate majors through the incorporation of strategies targeted at traditionally underrepresented students (low-income, ethnic and racial minorities, women, and persons with disabilities);
- Programs that (a) facilitate student exposure to potential careers, including cooperative programs with industry or government that place students in internships as early as the summer following their first year of study; (b) provide part-time employment in industry during the school year; or (c) provide opportunities for undergraduates to participate in industry- or government-sponsored research;
- Programs to encourage undergraduate research, particularly in the early undergraduate years, on- or off-campus;
- Programs that assist institutions of higher education in states that participate in the Experimental Program to Stimulate Competitive Research (EPSCoR) to broaden the STEM student base or increase retention in these fields;
- Programs that provide financial incentives to students entering and persisting in the study of STEM; or
- Other approaches to achieving program goals.

The intent of a STEP project should be to make a significant impact on the culture at an institution(s) with the expectation that major portions of the impact will be sustained after the completion of the project. Although the use of scholarships is allowed as one part of a larger strategic effort to retain students, if the project is intended to rely largely on scholarships, it should be submitted to the
NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program.

For projects that are considering outreach to high school students, such activities are only appropriate if they will recruit students to the proposing institution(s) and if the high school students will be entering and progressing through undergraduate STEM majors within the five-year period of the proposed project. In most cases, this requires that outreach and recruitment efforts be limited to juniors and seniors in high schools that have a history of sending their graduates to the proposing institution(s).

Outcomes

The outcomes expected of funded Type 1A, Type 1B, and Type 1C STEP projects include all of the following:

- Significant progress toward achieving the specific increases proposed in the number of students who are United States citizens or permanent residents obtaining STEM degrees at institutions with baccalaureate degree programs; or completing associate degrees or completing credits toward transfer to a baccalaureate degree program in STEM fields at community colleges;
- A description of the activities that have been institutionalized as a result of the project;
- A description of the expectations, following the end of the grant period, for continued efforts at the institution to increase the number of STEM degrees in established or emerging fields at institutions with baccalaureate degree programs; or completing associate degrees in established or emerging fields or completing credits toward transfer to a baccalaureate degree program in STEM fields at community colleges;
- An evaluation, using the preliminary indicators and benchmarks defined in the proposal, that informs the institution and others about the effectiveness of specific implementation strategies; and
- Effective dissemination of project processes and results to the broader community.

All Type 1A and Type 1B grants will be reviewed during their third year to determine whether satisfactory progress has been made, with continued funding contingent on the result of the third-year review.

In addition to the individual project evaluation, Principal Investigators of all Type 1 awards will be required to participate in evaluation activities related to the Directorate for Education and Human Resource's program monitoring and program evaluation.

Type 2

Program activities under the STEP Type 2 competition represent educational research on factors affecting associate or baccalaureate degree attainment in STEM. The results are expected to contribute to the knowledge base of scholarly research in education. Proposals requesting up to a total of $1.5 million for projects of up to a duration of four years should be based in a research design that incorporates appropriate and proven methodologies and strategies. The proposal should identify the research questions, and the results should provide convincing evidence of the relationship of the factor(s) (including departmental/institutional) studied to the issues of associate and/or baccalaureate degree attainment, and/or undergraduate access to STEM careers, and/or persistence to STEM graduate study. These educational research studies should reflect explicit cognizance of the broad variety of institutions of higher education, and should address the unique challenges and opportunities posed by that variety. Studies that involve a single institution are discouraged unless the proposal provides compelling arguments that the results can be generalized to the larger community. The proposed research should be developed with the intent to provide the education community, including faculty, administrators, policymakers, and parents, with practical information to consider with respect to the impact of the factor(s) being studied within the educational system. The results should enable the education community to guide better the future development of learning experiences, and to foster the retention and academic success of diverse students in STEM. Faculty in STEM disciplines are strongly encouraged to collaborate with appropriate experts in educational research when developing a Type 2 proposal.

Note that broader research opportunities in student learning and student academic success are eligible for support under the Research and Evaluation on Education in Science and Engineering (REESE) Program.

Outcomes

The outcomes expected of funded Type 2 STEP projects include all of the following:

- Evidence concerning an important factor(s) and its role(s) in associate and/or baccalaureate degree attainment, and/or undergraduate access to STEM careers, and/or persistence to STEM graduate study;
- Practical information useful to educators about the impact of the factor(s) that has been studied within the educational system; and
- Dissemination of the research results to the education community.

III. AWARD INFORMATION

The number and size of awards will depend on the quality of the proposals received and the availability of funds.

Type 1

Grant duration for Type 1A and 1B awards is expected to be 5 years, with the final 2 years of funding contingent on determination that satisfactory progress has been made by the awardee during the first 3 years. The level of funding for which institutions can apply is based on their total enrollments of undergraduate students (full-time equivalents). Institutions enrolling 5,000 or fewer undergraduate students may request up to a total of $500,000 for a period of five years, those enrolling between 5000 and 15,000 undergraduate students may request up to a total of $1.0 million for five years, and those enrolling more than 15,000 undergraduate students may request up to a total of $2.0 million for five years. Consortia of institutions are eligible to request funds within these limits based on their total, combined undergraduate enrollment. Such consortial requests must provide clear evidence that the proposed partnership is both meaningful and important to the success of the project. In addition, consortia for which the lead institution is one that awards baccalaureate degrees may request additional funds if the consortium includes one or more institutions that award only associate degrees, and if the institution(s) that awards associate degrees has a substantive role in the project and will receive significant funding under the request. In such cases the total that may be requested is raised from $500,000 to $600,000, or from $1.0 million to $1.2 million, or from $2.0 million to $2.5 million according to the guidelines above based on the total, combined enrollments of undergraduate students (full-time equivalents).

Grant duration for Type 1C awards is expected to be 2-3 years. Institutions may request a total of up to 50% of the total amount for which they were funded under the predecessor award.

Awards will be made as standard or continuing grants. The expectation is that about 15 to 20 Type 1 awards will be made each year.

Type 2

Grant duration for Type 2 awards is 1 to 4 years, and the request may be up to a total of $1.5 million. Type 2 proposals are exempt from the restriction on Type 1 proposals limiting an institution to participation in only one submission. The expectation is that 1 to 3 Type 2 awards will be made each year.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Type 1 proposals are invited from academic institutions in the United States and its territories, from consortia thereof, or from nonprofit organizations that have established consortia among such academic institutions. The academic institutions must offer either associate degrees or baccalaureate degrees in science, technology, engineering and/or mathematics (STEM). Associate degree-granting institutions with a demonstrated record of articulation to STEM baccalaureate programs need not necessarily grant associate degrees in STEM fields in order to be eligible for this program.

  Projects may involve a single institution, collaboration with business and industrial partners, or collaboration among several institutions. For example, projects may include collaborative efforts that improve the transition of students among the collaborating institutions, such as transfer between two- and four-year institutions.

  Type 2 proposals are invited from any individual or organization eligible to submit proposals to the NSF.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

An institution that awards baccalaureate degrees is allowed to submit only one Type 1 proposal, or to be part of only one consortium submitting a Type 1 proposal. An institution that awards associate degrees, and does not award baccalaureate degrees, is allowed to be the lead institution on only one Type 1 proposal, and, in addition, may be a partner on one or more Type 1 proposals. There are no restrictions on the number of Type 2 proposals that an individual or organization may submit.

Limit on Number of Proposals per PI:

See Limit on Number of Proposals per Organization

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(optional):*

Letters of Intent (optional): A letter of intent is optional but encouraged before submitting either a Type 1 or Type 2 proposal. Letters of intent must be prepared and submitted via FastLane. Please note that NSF will not comment on the Synopsis text, so do not include questions within that section. Please contact program officers directly with any questions that you may have.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 0 and Maximum of 99 Other Participating Organizations are allowed
- Indication of the type of project, either Type 1A, 1B, 1C or a Type 2 project is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is not allowed

Full Proposal Instructions: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the guidelines specified 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-PUBS (7827) or by e-mail from nsfpubs@nsf.gov.

The following instructions supplement the GPG guidelines:

Cover Sheet

- For Type 1 proposals, the signature of the Authorized Organizational Representative (AOR) on the Cover Sheet signifies that the proposer and all partner organizations understand and agree to the following statement: The AOR of each organization involved in this proposal is aware of this submission.

Project Description

In addition to describing the proposed activities, all Type 1A, 1B, and 1C proposals are expected to include within the 15 pages of the Project Description:

- The current undergraduate STEM enrollment and graduation figures at the institution(s), and the total undergraduate student enrollment (FTE) at the institution(s);
- A clearly stated summary of the numerical and percentage increases expected during the grant period in the number of students who are United States citizens or permanent residents obtaining STEM degrees at institutions with baccalaureate degree programs; or completing associate degrees or completing credits toward transfer to a baccalaureate degree program in STEM fields at community colleges;
- The reasons that working toward an increase in the number of students graduating in STEM areas is compatible with the institution's mission;
- A description of prior efforts to increase interest in STEM and results of those efforts;
- A statement of the overall vision that underlies the institution's management and implementation plan to increase the numbers of students graduating in STEM areas;
- The specific strategies to be used during the grant period to increase the number of students graduating in STEM fields, with rationales and justifications for these efforts;

- An explanation of why the proposed activities are not expected to cause decreases in the enrollments in other STEM fields, should the project activities focus on only a subset of STEM fields;
- A clear statement of which of the proposed activities, if successful, would be expected to be institutionalized by the end of the grant period, and of which of the proposed activities, if successful, would require further sources of support in order to be continued; and
- The preliminary indicators and benchmarks that will be used to determine which implementation strategies are proving to be effective; the evaluation plan should include methods that will help the project to determine how implementations might be improved, and to determine early on whether specific strategies are likely to be effective.

In addition to the information that must be included in all Type 1 proposals, a Type 1B proposal must provide:

- Information about the previous Type 1 grant including evaluation information that supports claims of successes that have been achieved and the degree to which the previous project has been institutionalized;
- A description of significantly new directions in which the project will be heading, the rationale for choosing these new directions, and the relationship between the previous project and the proposed project; and
- An analysis of at least four years of data about the effects of the previous STEP Type 1 grant on student enrollments and graduation rates in STEM.

In addition to the information that must be included in all Type 1 proposals, a Type 1C proposal must provide:

- Information about the accomplishments to date under the existing Type 1 award, including evaluation results for at least four years of efforts under the original award; and
- A description of the opportunities to be pursued that arose as mid-course corrections or unforeseen related opportunities as a direct result of work under the original grant.

The National Science Foundation allows maximum flexibility in the design of efforts to increase the number of students receiving associate or baccalaureate degrees in established or emerging fields within STEM fields. However, the Type 1 proposal must fully document the rationales for choosing the efforts to be undertaken, including relevant results from efforts that have been undertaken at other institutions in the past. The emphasis in the proposal should be on the adaptation and implementation of best practices. The relevant research or knowledge base that supports the effectiveness of the efforts should be included, when appropriate. If innovative strategies are proposed, the proposal should include compelling arguments for why these strategies are expected to result in an increase in the number of students earning associate or bachelor degrees in STEM. Funded Type 1 projects will be expected to establish an internal Advisory Committee, chaired by the Chief Academic Officer (or other appropriate administrative official should the Chief Academic Officer be a PI or co-PI on the project) at the institution, with members drawn from disciplines across the STEM fields. The members of this internal Advisory Committee should be specified in the proposal. This committee is expected to meet with project personnel at least once every six months throughout the grant period in order to provide advice to the project, and to facilitate dissemination about the project throughout the institution(s). In addition, funded Type 1 and Type 2 proposals will be expected to establish an external Advisory Committee of three to four members from outside the project institution(s). This committee is expected to meet with project personnel within three months of the start of the project and then at yearly intervals in order to provide advice to the project. The members of the external Advisory Committee need not be specified in the proposal but can be named at the time that a project is recommended for funding.

Additional Instructions

A Project Data Form must be submitted as part of all Type 1 and Type 2 proposals. The information on this form is used to direct proposals to appropriate reviewers and to determine the characteristics of projects supported by the Division of Undergraduate Education (DUE). In FastLane, this form will appear in the list of forms for your proposal only after you have (1) selected the "STEP" program announcement/solicitation number on the Cover Sheet and (2) saved the Cover Sheet.

Special Information and Supplementary Documentation

Letters of Support are allowed in the Special Information and Supplementary Documentation Section. Other documents are allowed in this section only as specified in the NSF Grant Proposal Guide.

Proposers are reminded to identify the program solicitation number (NSF 08-569) 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.

B. Budgetary Information

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

Other Budgetary Limitations:

Grant duration is expected to be 5 years for Type 1A and 1B proposals, 2-3 years for Type 1C proposals, and 1-4 years for Type 2 proposals.

Grant duration for Type 1A and 1B awards is expected to be 5 years, with the final 2 years of funding contingent on determination that satisfactory progress has been made by the awardee during the first 3 years. The level of funding for which institutions can apply is based on their total enrollments of undergraduate students (full-time equivalents). Institutions enrolling 5,000 or fewer undergraduate students may request up to a total of $500,000 for a period of five years, those enrolling between 5000 and 15,000 undergraduate students may request up to a total of $1.0 million for five years, and those enrolling more than 15,000 undergraduate students may request up to a total of $2.0 million for five years. Consortia of institutions are eligible to request funds within these limits based on their total, combined undergraduate enrollment. Such consortial requests must provide clear evidence that the proposed partnership is both meaningful and important to the success of the project. In addition, consortia for which the lead institution is one that awards baccalaureate degrees may request additional funds if the consortium includes one or more institutions that award only associate degrees, and if the institution(s) that awards associate degrees has a leadership role in the project and will receive significant funding under the request. In such cases the total that may be requested is raised from $500,000 to $600,000, or from $1.0 million to $1.2 million, or from $2.0 million to $2.5 million according to the guidelines above based on the total enrollments of undergraduate students (full-time equivalents). For Type 2 proposals, individuals or organizations are eligible to request up to a total of $1.5 million.

For both Type 1 and Type 2 proposals, the budget should include provisions for the Principal Investigators and several additional project personnel to attend an annual meeting of STEP Principal Investigators in the Washington, DC, area.

C. Due Dates

- **Letter of Intent Due Date(s)** ***(optional)*** (due by 5 p.m. proposer's local time)***:***

  August 19, 2008

  August 18, 2009

August 17, 2010

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

  September 30, 2008

  September 29, 2009

  September 28, 2010

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this program solicitation through use of the NSF FastLane system. Detailed instructions regarding the technical aspects of proposal preparation and submission via FastLane are available at: http://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program 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.

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.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

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:

In considering the above criteria for Type 1A, 1B, and 1C proposals, reviewers will be asked to comment on the following:

- Does the projected increase in STEM graduates appear aligned with the mission of the institution(s) and the design

of the project?
- Is a compelling overall vision provided for the plan of the institution(s) to achieve a substantial increase in STEM graduates, and is the proposed effort important to the attainment of that vision?
- Is strong justification provided to indicate that the proposed efforts are likely to be successful?
- Do the management and implementation details provide appropriate support for the proposed project?
- Are the proposed efforts likely to lead to an increase in the total number of STEM graduates, as opposed to causing an increase in one or a few STEM fields while allowing for a decrease in other STEM fields?
- Does the evaluation plan include appropriate preliminary indicators, benchmarks, and methods for determining the effectiveness of the proposed implementation strategies?
- Are clear statements provided elaborating which of the proposed activities are likely to be institutionalized by the end of the grant period, and which of the proposed activities would require further sources of support in order to be continued?

In addition to the questions that reviewers will be asked to comment on for all Type 1 proposals, reviewers will be asked to comment on the following for Type 1B proposals:

- To what extent has the previous STEP award at the institution been successful?
- Is the relationship between the previous STEP award and the proposed project clear, and are the rationales for choosing new directions convincing?

In addition to the questions that reviewers will be asked to comment on for all Type 1 proposals, reviewers will be asked to comment on the following for Type 1C proposals:

- To what extent has the previous STEP award at the institution been successful?
- Are the proposed efforts to pursue mid-course corrections or unforeseen related opportunities grounded in data that provide convincing arguments that these efforts are important ones to pursue?

In considering the above criteria for Type 2 proposals, reviewers will be asked to comment on the following:

- Does the proposal identify a significant factor(s) in facilitating associate and/or baccalaureate degree attainment, and/or undergraduate access to STEM careers, and/or persistence to STEM graduate study, and are the proposed efforts likely to lead to significant findings?
- Is the study likely to provide practical information useful to educators about the potential impact of the factor(s) being studied?
- How likely is the dissemination plan to inform all parts of the education community of important results from the project?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by 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 Research 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/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@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, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report 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. The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

Principal Investigators will be required to participate in evaluation activities related to the Directorate for Education and Human Resources's program evaluation. In addition, each academic institution involved in a funded project will be expected to provide annually, to the principal investigator of the project, data pertaining to student enrollments, student achievement, student persistence to degrees, and student placements following graduation.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Susan H. Hixson, Lead Program Director, STEP, Division of Undergraduate Education, 835 N, telephone: (703) 292-4623, email: shixson@nsf.gov
- Scott Grissom, Co-Lead Program Director, STEP, Division of Undergraduate Education, 835 N, telephone: (703) 292-4643, email: sgrissom@nsf.gov
- David J. Matty, Co-Lead Program Director, STEP, Division of Undergraduate Education, 835 N, telephone: (703) 292-5323, email: dmatty@nsf.gov
- Myles G. Boylan, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-4617, email: mboylan@nsf.gov
- Eun-Woo Chang, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-4674, email: ewchang@nsf.gov
- Dennis Davenport, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-4659, email: ddavenpo@nsf.gov
- Connie K. Della-Piana, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-5309, email: cdellapi@nsf.gov
- Ning Fang, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-8637, email: nfang@nsf.gov
- Bert E. Holmes, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-5128, email: bholmes@nsf.gov
- Russell L. Pimmel, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-4618, email: rpimmel@nsf.gov
- Janis P. Terpenny, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-4640, email: jterpenn@nsf.gov
- Lee I. Zia, Program Director, Division of Undergraduate Education, 835 N, telephone: (703) 292-5140, email: lzia@nsf.gov

For questions related to the use of FastLane, contact:

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

General inquiries regarding Science, Technology, Engineering, and Mathematics Talent Expansion Program should be made to: Division of Undergraduate Education, telephone: 703-292-8670, e-mail: undergrad@nsf.gov.

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, National Science Foundation Update is a free e-mail subscription service 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 when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the NSF web site.

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:**

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

  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:

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