

# Science and Technology Centers: Integrative Partnerships

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## Program Solicitation

**NSF 03-550**

**Replaces Document NSF 00-67**



**National Science Foundation**  
Office of Integrative Activities

### **Preliminary Proposal Due Date(s) (required):**

June 03, 2003

Preliminary proposals are due by 5:00 p.m. local time of the submitting institution.

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

February 10, 2004

Full proposals are by invitation only.

## **SUMMARY OF PROGRAM REQUIREMENTS**

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### **General Information**

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#### **Program Title:**

Science and Technology Centers: Integrative Partnerships

#### **Synopsis of Program:**

The Science and Technology Centers (STC): Integrative Partnerships program enables innovative research and education projects of national importance that require a Center mode of support to achieve the research, education, and knowledge-transfer goals shared by the partners. STCs conduct world-class research in partnerships among academic institutions, national laboratories, industrial organizations, and/or other public/private entities to create new and meaningful knowledge of significant benefit to society.

Science and Technology Centers build intellectual and physical infrastructures within and between disciplines, and bring together the creation, integration, and transfer of new knowledge. STCs nurture and foster education by integrating education with research, and by creating bonds between learning and inquiry so that discovery and creativity more fully support the learning process. STCs demonstrate leadership to increase diversity by including all members of society regardless of race, ethnicity or gender in science and engineering in all aspects of the Center's activities.

Centers offer the research and engineering community an effective mechanism to undertake long-term scientific and technological research and education activities; to explore better and more effective ways to educate students, and to develop mechanisms to ensure the timely transition of research and education advances made into service in society. STC proposals are encouraged for high quality innovative research projects that undertake important investigations at the interfaces of disciplines, and/or fresh approaches within disciplines. The STC program invests federal funds in areas consistent with the goals of the NSF Strategic Plan to enable the Nation's future through discovery, learning and innovation.

To date, a total of four competitions have been held to establish NSF Science and Technology Centers. The first two competitions, one in the late 1980s and one in the early 1990s, led to the establishment of 25 Science and Technology Centers that subsequently graduated from NSF support. A third competition for Science and Technology Centers: Integrative Partnerships culminated in 1999 with the National Science Board's approval to award five new Centers. A subsequent fourth competition resulted in an additional six new Centers in late 2002, for a total of 11 Science and Technology Centers, currently.

#### **Cognizant Program Officer(s):**

- Margaret E.M. Tolbert, Senior Advisor, Office of the Director, Office of Integrative Activities, 1270 N, telephone: (703) 292-8040, fax: (703) 292-9040, email: [mtolbert@nsf.gov](mailto:mtolbert@nsf.gov)

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

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

#### **Eligibility Information**

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- **Organization Limit:**

Preliminary proposals and invited full proposals may be submitted by U.S. academic institutions that have significant research and degree-granting education programs in any area of research normally supported by NSF.

A partner is an institution or organization that invests intellectual resources in the Center, backed by financial commitment to the Center. Partnerships may include multi-institutional collaborations or arrangements with other universities/colleges, national laboratories, research museums, private sector research laboratories, state and local government laboratories, and international collaborations. The partner institutions work together with NSF to ensure vital participation in a cooperative effort to integrate the research, education, and knowledge transfer activities of the Center. The lead institution has ultimate responsibility for planning, operating, and managing the Center.

- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** 5. A single institution may submit no more than five preliminary proposals as lead institution, but may be involved as a partner in additional preliminary proposals submitted by other institutions. The STC program will not normally site visit more than one proposed Center from any one lead institution in this competition, and will not normally provide simultaneous support for more than one STC led by any one institution from this competition. Full proposals are to be submitted only when invited by NSF.

## Award Information

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- **Anticipated Type of Award:** Other - Cooperative Agreement with an initial commitment of five years and a potential maximum duration of ten years.
- **Estimated Number of Awards:** 6 to 8
- **Anticipated Funding Amount:** \$30,000,000 Funds are approximate and subject to availability in FY 2005.

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

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

### B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is Specialized. Please see the full text of this solicitation for further information.
- **Indirect Cost (F&A) Limitations:** Not applicable.
- **Other Budgetary Limitations:** Not Applicable.

### C. Due Dates

- **Preliminary Proposals (required) :**

June 03, 2003

Preliminary proposals are due by 5:00 p.m. local time of the submitting institution.

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

February 10, 2004

Full proposals are by invitation only.

## Proposal Review Information

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- **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

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- **Award Conditions:** Additional award conditions apply. Please see the full text of this solicitation for further information.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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## I. INTRODUCTION

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### The Science and Technology Centers: Integrative Partnerships - Concept

The Science and Technology Centers (STC): Integrative Partnerships Program supports innovative research and education projects of national importance that promise to contribute to the Nation's future through discovery, learning and innovation. STCs conduct world-class research through partnerships of academic institutions with organizations such as national laboratories, industrial organizations, and/or other public/private organizations to create new and meaningful knowledge and long-term benefit to society. STC partnerships build intellectual and physical infrastructures within and between disciplines, weaving together the creation, integration, and transfer of new knowledge. STC partner institutions work together with the lead institution as an integrated whole to achieve the shared research, education, and knowledge-transfer goals of the Center. STCs exploit those opportunities in science, engineering and technology, where the complexity of the research agenda requires the duration, scope, scale, flexibility, and facilities that Center support can provide.

STCs foster excellence in education and integrate the Center's research programs with education. STCs provide a rich environment for encouraging future scientists, engineers, and educators to take risks in pursuing discoveries and new knowledge. STCs demonstrate leadership in the involvement of diverse groups underrepresented in science and engineering: STCs capitalize on diversity and broaden the participation of underrepresented groups in science and engineering in the Center by involving all members

of society regardless of race, ethnicity or gender, directly in all Center activities.

## II. PROGRAM DESCRIPTION

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### The objectives of the STC Program are to:

- Support research and education of the highest quality;
- Exploit opportunities in science, engineering and technology where the complexity of the research agenda requires the advantages of scope, scale, change, duration, equipment and facilities that a Center can provide;
- Support innovative frontier investigations at the interfaces of disciplines, and/or fresh approaches within disciplines;
- Engage the Nation's intellectual talent, robustly drawn from its full human diversity, in the conduct of research and education activities;
- Promote organizational connections and linkages within and between campuses, schools and/or the world beyond (state, local, federal agencies, national labs, industry, international collaborations);
- Focus on integrative learning and discovery and the preparation of U.S. students for a broad set of career paths; and
- Foster science and engineering in service to society especially with respect to new research areas, promising new instrumentation and potential new technologies.

### Science and Technology Center Features

The Center partners share an ambitious research vision or theme of national importance that integrates research and education and is of sufficient scale to justify the Center mode of support. The Center's research area or theme may involve any area of research supported by the Foundation. The role of each partner in achieving the goals of the Center is essential to the success of the unified Center. STCs vary in size and exhibit diverse forms of organization, participation, and operation suited to the needs of the individual Center activities. The size, structure, and operation of an STC are determined by the proposed research, education, and knowledge transfer activities. Not every partner must support every aspect of the Center's activity, but all the expected features of a Center must be accomplished by the integrated portfolio of partners.

Each Center has dedicated full-time leaders in key positions who are responsible for Center direction, management, education, and knowledge transfer. Center management and education positions require full-time personnel supported through the Center budget.

The STC program seeks to support education directed to the development of students and faculty to achieve a diverse, internationally competitive and globally engaged workforce of scientists, engineers, and well-prepared citizens. **Each STC integrates** the research activities with the education of the Center students in a form that depends upon the context of the Center, its partner, and the particular disciplines participating in the conduct of research. For STCs, integrating research and education requires the ability to develop effective educational programs that will broaden the career paths of American students and will attract more Americans into graduate studies. STC education goals address the educational needs of students participating in the Center research activities, and of students in the broader fields of research represented by the STC activities. The Center may involve other college and pre-college students, faculty and teachers as appropriate for the Center goals. STCs also establish knowledge transfer activities appropriate for the specific Center research activities and partners.

Increasing the participation of diverse U.S. citizens including women and underrepresented minorities by creating opportunities and enabling them to contribute 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 activities it considers and supports. Underrepresented minorities include persons with disabilities and people whose representation in science and engineering is less than their representation in the population: blacks, Hispanics, and Native Americans, including American Indians, Alaskan Natives and Pacific Islanders. To achieve their diversity objectives, STCs strive to involve individuals from underrepresented groups as members of the Center faculty, and as students actively engaged in the Center activities. An STC may also choose to form substantive and long-term partnerships and collaborations with minority-serving institutions.

Education and human resource development as conducted by Centers is directed both to formal education through research and coursework and to supplemental education through internships, summer programs, workshops, recruitment and retention programs, and other such activities beyond the formal classroom. For STCs, developing human resources also requires the ability to increase student and faculty participation by U.S. citizens in research and education, particularly women and underrepresented minorities.

STCs foster a climate of interaction and effective knowledge transfer both among departments across the lead academic institution and among the academic institution and its partners, and may include industry, government, colleges, local communities and the public. Knowledge transfer activities involve the mutual exchange of scientific information between the Center partners and others with the objective of applying the knowledge to the operations or activities of the groups sharing the information. Knowledge transfer may be accomplished in various ways, including the involvement of industrial or other non-academic specialists on the STC advisory committee, partnerships with these institutions, faculty consulting relationships with industry, visiting instructorships by industrial scientists at the STC, student internships in industry, etc. Knowledge transfer is about spreading and utilizing knowledge in society broadly through all sectors, and sharing resources to further the production and utilization of new knowledge.

#### **Each Center must:**

- Be based in an academic institution;
- Be directed by a science or engineering faculty member and be integrated into academic programs;
- Reflect a commitment to achieving strategic goals shared by the lead and partnering institutions as demonstrated by cost sharing and other institutional commitments;
- Provide research and education opportunities for U.S. students and faculty that will achieve outcomes consonant with the Center's goals;
- Have significant intellectual exchange and resource linkages among various types of institutions and organizations to facilitate knowledge transfer (e.g., schools; colleges and universities such as minority-serving institutions, community colleges, EPSCoR institutions, and others; nonprofit organizations; national laboratories; industry; federal, state, and local governments);
- Include industrial, national or international internships or other career broadening experiences as appropriate to the research area;
- Have an annual budget ranging from \$1.5M to \$4.0M of NSF support;
- Demonstrate appropriate leadership and management for the Center programs;
- Convene an External Advisory Committee annually; and
- Participate in the National Network of STC Directors.

#### **Center Leadership, Management, and Oversight**

The Center Director must have the leadership capacity to develop and lead a diverse team to fulfill the vision of the Center. The Center-financed team must support the Director in his/her role and take responsibility for management, education and knowledge transfer. The Center Director may choose to direct the research or may choose to delegate responsibilities to selected research leaders. The key members of the Center team must demonstrate adequate management experience and qualities to administer their component of the Center. The Center team must develop an organizational plan to share responsibilities as appropriate.

The Center Director is responsible for the management, staffing, and resource allocation of the Center, for administering the award in accordance with NSF policies and the terms of the Cooperative Agreement, and for serving as the liaison between the Center and the National Network of STC Directors. The Center Director must assure that the STC develops the ability to communicate with the NSF and the other STCs electronically, including web-based distribution of information and videoconferencing capability.

In addition, the Center will maintain and convene annually an External Advisory Committee (EAC). The function of the EAC is to provide guidance, advice, and oversight for all the Center's activities, consistent with its vision, goals, and objectives. The EAC membership is subject to NSF review and must include representation from those served by the Center (e.g., academic institutions, industry, state and local agencies, national laboratories), and include women and underrepresented minorities. The EAC membership must also include representation having the capability to assess all aspects of the project including the management, research, education, and knowledge transfer components. Individuals with a financial, institutional, or collaborative connection to the Center may not serve as members of the external advisory committee. The EAC shall develop a charter and submit it with the first annual progress report.

### **National Network of STC Directors**

The STC Directors will serve collectively as members of a national liaison team for the STC Program. This National Network of STC Directors is charged with addressing common goals, problems and opportunities, and facilitating personnel and resource exchanges as well as integrating partnerships and cooperation among Centers. The STC Directors are responsible for developing, implementing, and maintaining a liaison structure with active participation of each Center. A chair of this liaison team will be elected annually by participating members and will serve a one-year term.

Typical functions of the National Network of STC Directors include: fostering complementarity and balance among research, education and knowledge transfer activities, and avoidance of duplication of effort; facilitating interactions to address research, education, and management issues and opportunities which transcend individual Center capabilities; liaison with private sector, state, local and national laboratories to identify needs/opportunities and to plan joint implementation strategies, workshops, and other forums; cooperation and liaison with NSF staff in the development and maintenance of databases and other effective metrics in response to the requirements of the Government Performance and Results Act; and preparing documents or web sites to enhance public understanding concerning the importance of science, engineering, technology and education advances in service to society.

### **Milestones for this competition of the STC Program from FY-2003 to FY- 2005:**

1. Preliminary Proposals due June 3, 2003
2. Panel Review of Preliminary Proposals September 10-17, 2003
3. Announce Invited List and Inform Declines October 15, 2003
4. Invited Full Proposals due February 10, 2004
5. Full Proposal Review (Mail and Panel) March-May, 2004
6. Site Visits (Management and Budget focus) September-October, 2004

7. NSF Ad Hoc STC Advisory Committee (Blue Ribbon Panel) early December, 2004
8. NSF-STC Management Team Recommends December 2004 -January 2005
9. Recommendations to NSF Senior Management January 2005
10. Declines informed January 2005
11. Recommended Awards announced March 2005
12. Anticipated date of awards June/July 2005

### III. ELIGIBILITY INFORMATION

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Preliminary proposals and invited full proposals may be submitted by U.S. academic institutions in the U.S. that have significant research and degree-granting education programs in any area of science and engineering normally supported by NSF.

A single institution may submit no more than five preliminary proposals as lead institution, but may be involved as a partner in additional preliminary proposals submitted by other institutions. Each proposal must demonstrate the institutional commitment to the area proposed. The STC Program will not normally site visit more than one proposed Center from any one lead institution in this competition, and will not normally provide simultaneous support for more than one STC led by any one institution from this competition.

For eligibility purposes, cost sharing at a level of 30% of the requested total amount of NSF funds (no more, no less) is required for all preliminary and full proposals submitted in response to this solicitation. Cost sharing will be required at a level of 30% of the total amount provided by NSF for any STC funded by NSF. Proposed STC annual budgets may range from \$1.5M to \$4.0M per year of NSF support. Preliminary proposals and full proposals outside this range will not be reviewed or considered for support by the STC program.

Proposals are encouraged for innovative frontier research investigations at the interfaces of disciplines, and/or fresh approaches within disciplines, where partners work together to achieve the integration of research and education and knowledge transfer. A partner is an institution or organization that invests intellectual resources in the Center, backed by financial commitment to the Center. Partnerships may include multi-institutional collaborations or arrangements with other universities/colleges, national laboratories, research museums, private sector research laboratories, state and local government laboratories, and international collaborations.

One of the partner institutions must accept overall management and budgetary responsibility for the proposed Center and is thus designated as the lead institution. The lead institution has ultimate responsibility for planning, operating, and managing the Center. Proposals must describe the essential role of each partner institution and explain the contribution of each partner to the integrated research, education and knowledge transfer goals of the Center as well as the functions and management of the Center. Proposals must contain a management plan which describes how the partner institutions will be administered and how each will participate in Center activities.

Past STCs or group members from Centers may participate in this open competition, but must propose to focus on radically different research and education topics or themes from those they were pursuing with prior NSF support. To be radically different, the proposers must focus on a different research topic and different education issues, not simply extend the methods and intent of the past STC to a slightly larger purview or a new geographic area.

The STC Program complements the NSF Engineering Research Centers (ERC), the Materials Research

Science and Engineering Centers (MRSEC), the Nanoscale Science and Engineering Centers program, and other programs that support group research and education activities. Simultaneous submission of duplicate or substantially similar proposals to other NSF programs is not permitted, and such proposals will not be considered. However, participation in a Center does not preclude individuals from receiving NSF support for their individual research in complementary areas.

#### **IV. AWARD INFORMATION**

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Approximately \$30 million is expected to be available for this competition in FY 2005, pending availability of funds. Depending upon the availability of funds, NSF expects to make six to eight awards. Each award will be made as a Cooperative Agreement to the lead institution, with an initial commitment for five years of support and a potential duration of ten years. The amount of the NSF's investment in each Center will depend upon the needs, plans, and opportunities offered by the Center, as well as the availability of NSF funds. Awards from this competition are expected to commence in June/July 2005.

Oversight of each individual STC is the responsibility of the appropriate NSF research directorate in coordination with the Office of Integrative Activities (OIA). Support for each year of the Cooperative Agreement of a funded STC will be contingent upon a satisfactory annual review by NSF of the Center's progress and future plans. Review by NSF will take place annually during the first five years.

Each Center will undergo an in-depth review in the fourth year to determine whether NSF will continue to support full Center operations for another five-year period or will provide decreased funding to phase out NSF support of the Center over the remaining one year of the Cooperative Agreement. In the fourth year of operation the STC may submit a renewal proposal for continued support. The STC's achievements and future plans will be evaluated comprehensively to determine if the STC is meeting the goals and objectives as originally proposed as well as the goals and objectives of the STC Program. The review will consist of an ad hoc mail review, and a formal on-site review, with external reviewers who will produce a written report to NSF. Centers successful in passing the fourth-year review will be renewed for another five years, commencing at the beginning of the sixth year. The Cooperative Agreement will include a two-year phase-out period for years nine and ten. Centers that pass the fourth-year review will continue to be reviewed by NSF at least every 18 months. Centers that do not pass the fourth year review will be phased-out over a one-year period at a reduced level of support. The NSF may support an STC for a maximum of ten years.

#### **V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

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##### **A. Proposal Preparation Instructions**

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###### **Preliminary Proposals: *(required)*:**

Preliminary proposals are to be submitted electronically via the NSF FastLane system. When preparing a preliminary proposal for this competition, proposers are advised to review the Program Description and the Proposal Review Information found in this solicitation for general information pertinent to this program. Required preliminary proposal components are given below. Strict adherence to page limitations given in this document must be followed. Descriptions should be clear and concise. Proposers should review the most current NSF Grant Proposal Guide (GPG) ( [NSF 03-2](#)) for specific information on signatures and format for the required sections. Proposers are also encouraged to access the STC web site for updated information and answers to frequently asked questions (FAQ's) relevant to this competition: <http://www.nsf.gov/od/oia/programs/stc/2003>.

###### **Preliminary Proposal Contents**

The NSF GPG describes single copy documents that are to be submitted via FastLane. For preliminary proposals these documents include:

- a. Information About Principal Investigators/Project Directors and co-Principal Investigators/co-Project Directors (voluntary);
- b. Deviation Authorization (if applicable);
- c. List of Suggested Reviewers or Reviewers Not to Include (optional);
- d. Proprietary or Privileged Information (if applicable);
- e. Proposal Certifications.

### **Required Sections of the Preliminary Proposal**

The preliminary proposal items allowed will consist only of the main documents and supplementary documents described in Sections (1)-(10) below.

(1) Cover Sheet. For planning purposes, June 15, 2005, should be shown as the start date. The proposed Center Director must be shown as as the Principal Investigator.

(2) Project Summary(up to 2 pages). The summary should be written in the third person and should provide a rationale for a Center, describe the unique opportunities to be provided by the Center, and indicate the potential national impact of the Center. The summary should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader. Provide a clear description of the proposed Center, its vision, mission, and goals, its distinguishing features and focus. Describe the value added of funding the activity as a Center. State the long-range plans for the proposed research and education areas, indicate how the research and education are to be integrated, provide the knowledge transfer strategy of the Center, and state the diversity goals of the Center. The names of the partner institutions involved with the proposed Center and the major contribution of each to the Center components must be included in the description. The merit review criteria must be addressed in separate statements (see GPG for additional instructions).

(3) Table of Contents.

(4) Project Description. The Project Description must contain Sections (4.a) through (4.d), and is **limited to 10 pages** including tables and illustrations regardless of the number of research groups or themes. URL's may not be used (see GPG for additional information). The broader impacts resulting from the proposed project must be addressed and described as an integral part of the narrative. Results from Prior NSF Support should not be included in the Project Description.

(4.a) Narrative description of the Center's Research Plans and Objectives (by topic or research area): State and briefly describe the long range research goals of the integrated Center. Provide sufficient detail to allow assessment of the scientific merit and the necessity for the Center mode of operation. Name the lead partner organizations and lead/key individuals. Indicate the significant role of each partner and key research group in the research activity. Indicate the potential impact or expected significance the Center's research will have on the Nation's scientific and/or technological base. The research focus should be sufficiently long-term to justify a Center form of organization and flexible enough to permit change as the research proceeds. Provide a tentative timeline for major milestones to be achieved over the first five year period.

(4.b) Narrative description of the Center's Education and Human Resource Plans and Objectives: Briefly describe the education and human resource goals, provide a rationale for those goals, and indicate desired outcomes for the first five year period. STC education goals should address the educational needs of students participating in the Center research activities and of students in the broader fields of research represented by the STC, and may involve other college and precollege students, faculty, and teachers, appropriate to the Center goals.

Briefly describe how the education goals integrate strategically with the research and organizational/partnership opportunities of the Center. Outline plans for attracting and retaining high quality U.S. students in the Center research and education activities and for increasing the participation of women and underrepresented minorities in Center research and education activities. Describe plans in sufficient detail to allow assessment of their potential merit and impact.

(4.c) Narrative description of the Center's Knowledge Transfer Plans and Objectives: Briefly outline plans for significant intellectual exchange and resource linkages among various types of institutions and organizations to facilitate knowledge transfer. Knowledge transfer or exchange may involve the public and community groups, schools, colleges and universities such as minority-serving institutions, community colleges, EPSCoR institutions, and others; nonprofit organizations; national laboratories; industry; federal, state, and local governments. Include plans for linking appropriate communities and institutions beyond the sponsoring institutions to enhance involvement and knowledge transfer and the communication of science and engineering. Linkages should involve significant intellectual exchange and resource commitments, and may involve internships. Indicate the purpose and benefit of international collaborations and shared experimental facilities, as appropriate.

(4.d) Narrative Description of the Center's Leadership and Management Plan: Name the lead/key individuals. Describe the Center management team and provide an outline of the proposed arrangements for the integrated Center management structure. Describe the integrated organizational structure including plans for integrating and managing all partners involved in the research, education, and knowledge transfer components.

(5) Budget (see GPG). Provide a one-page budget for the full 5 year period (this should be entered in Budget Year 1 in FastLane). The proposed budget should be consistent with the needs and complexity of the proposed activity. Details of the budget justification should provide some information for each year of the full five-year period, showing how funds will be allocated to the research, education and knowledge transfer areas during the start-up phase, and major equipment that will be required. Cost sharing at a level of 30% ( no more, no less) of the requested total amount of NSF funds is required. The proposed cost sharing must be shown on line M of the preliminary proposal budget as follows: the lead institution budget should show the total cost sharing (cash and in-kind) from all sources, including all subawardees, on line M. In the budget justification (up to three pages), itemize by source and amount the cash and in-kind cost sharing reported on line M.

(6) References Cited (two-page limit). See NSF GPG instructions.

(7) Biographical Sketches (two-page limit per person). Biographical sketches are required for all personnel who have a role in the management, research, education, and knowledge transfer components of the Center. Use instructions from NSF GPG sections II.C.2.f. Copies of publications should not be included or sent to NSF.

**Special Information and Required Supplementary Documents (Sections 8-10):** (Required information to be entered in the Supplementary Documents section of FastLane)

(8) Lists of Partner Institutions and Project Personnel. Provide current, accurate information for the two required lists described below. This information provides NSF and reviewers with a comprehensive list of personnel and institutions involved in the STC, and is used when determining conflicts of interest in the review process. Lists (8.a) and (8.b) must be included in the preliminary proposal.

(8.a) Partner Institutions. List all institutions and organizations for which there are corresponding project personnel listed in Section (8.b.). List all partner organizations (those that have made a cash or in-kind commitment to the Center, e.g., industries providing student fellowships, etc.) at the time of submission of the preliminary proposal. Organize the list of institutions involved in the Center into the following categories, as applicable: Academic Institutions (colleges, universities), National Laboratories, Federal Government, Industry, Non-Governmental Organizations, State and

Local Government, International, and Other. For each category, list the partner institutions for that category in alphabetical order.

(8.b) Project Personnel. List all the personnel who have a role in the management, research, education, and knowledge transfer components of the Center. A corresponding biographical sketch should be provided in Section (7) above for all individuals included on this list. For each person, provide the first name, last name, and institution/organization. Subdivide the list of project personnel into the following categories, as applicable: Academic Institutions (colleges, universities), National Laboratories, Federal Government, Industry, Non-Governmental Organizations, State and Local Government, International, and Other. institutional commitments to resources and funding for the proposed Center. If appropriate, indicate facilities or major instrumentation to be shared.

(9) Projected Funding by Source (one-page limit). Provide a synopsis of institutional commitments to resources and funding for the proposed Center. If appropriate, indicate facilities or major instrumentation to be shared.

(10) Results of Prior Support for PI and CO-PI's (2 pages). Provide information only for the PI and each co-PI, for contributions to the development of human resources in science and engineering over the past five years (from any funding source). Include a brief statement of results of funded projects.

### **Required Information to be submitted to NSF via the FastLane Single Copy Documents Section (Section 11).**

The information to be entered in Section 11 should be entered as a separate Single Copy document.

(11) The information to be entered in Sections 11 (a) and (b) is required by NSF when determining conflicts of interest in the review process. The information includes the names of Project Personnel, the names of Collaborators and other Individuals with Conflicts. The information for 11 (a) and 11 (b) should be entered in the Single Copy Document section of FastLane "List of Personnel, Collaborators and Affiliates".

(11.a) Project Personnel. This is the same information as entered in Section (8.b).

(11.b) Collaborators/Individuals with Conflicts of Interest. Provide the names of all persons, participants and affiliates with potential conflicts of interest as specified in Section II.C.2.f.v.a-c. of the NSF GPG. For each person, enter the first name, last name, and institution/organization. For each person listed on the project personnel list include all co-authors/editors and collaborators (within the past 48 months); list all graduate advisors and advisees; list individuals who would act as external advisory committee members for the proposed Center; list all subcontractors who would receive funds through the Center.

No other items or appendices are to be included. Information pertaining to "Current and Pending Support", and "Facilities, Equipment and Other Resources" is not required for preliminary proposals and should not be included. Preliminary proposals containing items other than those required above will not be reviewed or considered for NSF funding.

### **Full Proposal Instructions:**

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

Full proposals will be accepted only if invited by NSF. When preparing a full proposal for this competition, proposers are advised to review the Program Description and the Proposal Review Information found in this solicitation for general information pertinent to this program. Proposers are encouraged to review the most

current NSF Grant Proposal Guide (GPG), NSF 03-2 <http://www.nsf.gov/pubsys/ods/getpub.cfm?gpg> for specific information on signatures and format for the required sections. Proposers are encouraged to review the STC web site for updated information and answers to frequently asked questions: <http://www.nsf.gov/od/oia/programs/stc/>.

Descriptions should be clear and concise. Every effort should be made to update information that was provided in the preliminary proposal and to fully address issues raised in the preliminary proposal review. Required proposal components and additions to or differences from the NSF GPG are given below.

### **Full Proposal Contents**

The NSF GPG describes single copy documents that are to be submitted via FastLane. These documents include:

- a. Information About Principal Investigators/Project Directors and co-Principal Investigators/co-Project Directors (voluntary);
- b. Deviation Authorization (if applicable);
- c. List of Suggested Reviewers or Reviewers Not to Include (optional);
- d. Proprietary or Privileged Information (if applicable);
- e. Proposal Certifications.

### **Required Sections of the Full Proposal**

The full proposal must include only the main documents and supplementary documents described in Sections 1-16, below.

(1) Cover Sheet. For planning purposes, June 15, 2005, should be shown as the start date. The full proposal must show the proposed Center Director as the Principal Investigator. Include the pre-proposal number and follow instructions provided in FastLane and GPG.

(2) Project Summary (two-page limit). The summary should be written in the third person and should make a compelling case for a Center. The summary should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader. Include the Center name, Director name, and name of lead institution at top of the first page. Write a clear description of the Center, provide a rationale for the Center; and state the mission and vision of the Center. Provide highlights of: its distinguishing features, multidisciplinary or disciplinary focus; the proposed research goals and goals for education of U.S. students in the Center; the integrative nature of the Center; the diversity goals of the Center; and the knowledge transfer strategy of the Center. Briefly indicate the unique opportunities that the Center will provide. Articulate the potential legacy and national impact of the Center if funded. Identify all partner institutions and describe the major contribution of each to the integrated Center activities. The merit review criteria must be addressed in separate statements (see GPG for additional instructions).

(3) Table of Contents.

(4) Project Description (exclude Results from Prior NSF Support)-- The Project Description must contain Sections (4.a) through (4.f) and is limited to 25 pages including tables and illustrations. The broader impacts resulting from the proposed project must be addressed and described as an integral part of the narrative.

(4.a) Rationale for Center Concept (one-page limit) -- Justify the Center approach: explain why a Center is necessary, and what unique opportunities will be provided by the Center; describe the potential legacy and National impact of the Center if funded; describe what will be achieved by

the Center mode that could not be achieved with group or individual support; provide the strategic plan and the long-term goals of the integrated Center; describe the integrative nature of the proposed Center.

(4.b) Narrative Description of the Management Plan for the Research, Education and Knowledge Transfer activities of the Integrated Center (three-page limit): Present a management plan for the integrated Center. Name the lead partner organizations responsible and lead/key individuals and their area of responsibility. Provide a clear description of the organizational structure of the integrated Center. Explain the role of each key participant/component of the organizational structure and how the management and coordination of the integrated Center will be accomplished. Include a plan for succession of the leadership of the Center. A figure to explain the organizational relationships may be used. Key areas of responsibility include the Center Direction, Management, Education, and Knowledge Transfer. Explain the approach for integrating and managing all partners involved in the research, education, and knowledge transfer activities. Describe the approach to be used to focus Center activities, how research projects will be selected and integrated with each other and with the education activities in the Center, how funds and equipment will be allocated across the Center activities and among partners, and how the involvement of all groups will be managed in the research and education activities of the Center. A description of a diverse external advisory group to provide guidance and advice to the Center on all activities is required. If a proposal is selected for a site visit, NSF will require additional information on the overall management plan for the Center.

(4.c) Narrative description of the Research Objectives of the Integrated Center (ten-page limit): State the overall vision and the goals of the Center research and provide a tentative timetable for achieving the goal(s). Name the lead partner organizations responsible and lead/key individuals. Describe the proposed research areas/themes, how they integrate with each other to realize the Center's research vision, and provide timelines for the activities. Provide a research plan with sufficient detail to allow assessment of the scientific merit and to justify the necessity for the Center mode of operation. Organize the description according to research topics or goals. Indicate the role of each partner/participant in the research topic/goal area. Indicate the potential impact or expected significance the Center's research will have on the Nation's scientific and/or technological base. The research focus should be sufficiently long term to justify a Center form of organization and flexible enough to permit change as the research proceeds. Include a description of current activities in research and, if the proposed Center research is closely related to ongoing research at an existing Center (e.g., an STC, ERC, MRSEC, or national laboratory), explain how the research activities of the proposed Center complement as well as differ from those of the existing Center(s). Explain how the proposed research relates to other state and national research capabilities as well as other related international programs in the proposed fields of research.

(4.d) Narrative description of the Education and Human Resource Development Objectives of the Integrated Center (five-page limit): State the education goals of the integrated Center; describe the rationale for the proposed education goals; provide a plan and timeline to achieve those goals, and explain how and when progress will be measured. Name the lead organizations responsible and lead/key individuals. Explain the contribution of each partner/participant in the education activity. STC education goals must address the educational needs of students participating in the Center research activities and address the educational needs of students in the broader fields of research represented by the STC. The education activities may involve other college and precollege students, faculty, and teachers, as appropriate to the Center's goals. Explain how the education and human resource development goals integrate with the research and organizational partnering opportunities of the Center. Describe plans for attracting and retaining high quality U.S. students in the Center research and education activities. Describe the proposed activities in sufficient detail to allow assessment of their intrinsic merit, potential effectiveness, anticipated contribution toward a diverse, highly competent, and globally-engaged technical and instructional workforce and educated citizenry, and other societal benefits. Provide a summary chart of M.S. and Ph.D. degrees completed during the past three years under the directorship of the proposed Center senior personnel.

Indicate average time to complete degree requirements, gender, ethnic origin, and nationality of the degree recipients.

(4.e) Narrative description of the Diversity Objectives of the Integrated Center (three-page limit): Describe the diversity goals to be achieved, provide plans for achieving those goals, and explain how progress will be measured. Describe the diversity of the Center's students (those that have been identified), students of the participating faculty, and the diversity of the participating faculty and partners. Describe plans for increasing diversity through the participation of women and underrepresented minority students and faculty in Center research and education activities. Describe the contribution/role of each partner institution in the diversity plans. Describe the proposed activities in sufficient detail to allow assessment of their intrinsic merit, potential effectiveness, anticipated contribution toward a diverse, highly competent, and globally-engaged technical and instructional workforce and educated populace, and other societal benefits.

(4.f) Narrative description of the Knowledge Transfer Objectives of the Integrated Center (three-page limit): state the knowledge transfer goals of the Center. Describe plans for significant intellectual exchange and resource linkages among various types of institutions and organizations to facilitate knowledge transfer (e.g., public and community groups; schools; colleges and universities such as minority-serving institutions, community colleges, EPSCoR institutions, and others; nonprofit organizations; national laboratories; industry; federal, state, and local governments). Discuss how students and/or faculty will be involved in this activity. Describe plans in sufficient detail to allow assessment of their merit and impact. Describe plans for linking appropriate communities and institutions beyond the sponsoring institution -- other colleges, schools, universities, disciplinary subfields, other disciplines, nonprofit research organizations, government laboratories, industry, state, local, and/or international entities -- to enhance involvement and knowledge transfer. Linkages should involve significant intellectual exchange and resource commitments such as funds, facilities, and/or people, in both directions between the sponsoring institution and partners, and may involve internships. Partnerships and linkages beyond the boundaries of the academic institution should be emphasized. Explain the role of each partner/participant in the Center's knowledge transfer activities. Explain the role of international collaborations and shared experimental facilities, as appropriate.

(5) Facilities and Equipment. This form must support the description of the infrastructure of the Center in the body of the proposal, Section (12), by describing the equipment and facilities available to the proposed Center.

(6) Budget and Budget Justification. Provide a budget for each of the five years. FastLane will automatically provide a cumulative budget. The proposed budget should be consistent with the needs and complexity of the proposed activity. The budget and budget justification should account for start-up time at the commencement of the Center activities. The Center management and education positions will require full-time lead personnel paid through the Center budget. Funds allocated for research, education, and knowledge transfer areas must be discernible. Cost sharing is required at a level of 30% (no more, no less) of the total amount of funds to be provided by NSF if the Center is funded. The proposed cost sharing must be shown on line M of the proposal budget as follows: the lead institution budget should show the total cost sharing (cash and in-kind) from all sources, including all subawardees. Each subawardee budget should show the total (cash and in-kind) cost sharing for the individual institution for the period covered by the budget sheet. In the budget justification, itemize by source and amount the cash and in-kind cost sharing reported on line M. The amounts for cost sharing reported on the budget form Line M should correspond to the amounts reported in the cost sharing table (Table 1) of Section (13) below.

Submit a separate budget and budget justification (two-page limit) for each participating institution in cases where a subcontract exceeds \$100,000 per year. Identify items of equipment costing more than \$10,000. Full justification for the latter is required. Individual graduate students may not be supported for a period in excess of five years.

NSF will not provide salary support for scientists, engineers, or educators employed by Federal agencies or

Federally Funded Research and Development Centers. For participants at foreign organizations, NSF will consider support only for the U.S. portion of the collaborative projects involving U.S. and foreign institutions.

(7) References Cited. Section not to exceed five pages.

(8) Biographical Sketches (two page limit per person). Biographical sketches are required for all key participants (e.g., the Center Director, Deputy Director, Education Coordinator, Knowledge Transfer Coordinator, Research Coordinator, Research Group Leaders, etc.). Use GPG instructions for sections II.C.2.f. Collaborations should be included with the list of Collaborators in Section (16.c) below. Copies of publications should not be included or sent to NSF.

(9) Current and Pending Support. (not required - do not complete this section)

**Special Information and Required Supplementary Documents (Sections 10-12):** (Required information to be entered in the Supplementary Documents section in FastLane)

(10 a.) Partner Institutions and (10 b.) Project Personnel. The Partner Institutions and Project Personnel that were required in preliminary proposal Sections (8.a) and (8.b) as part of the preliminary proposal (see Preliminary proposal Preparation Instructions) must be updated to reflect any changes occurring since the time of preliminary proposal submission. In addition, provide the names of External Advisory Committee Members appointed (if any) and their affiliations.

(11) Ethics and Intellectual Property Rights (one-page limit). Provide a clear statement of the proposed Center's policies on ethics and intellectual property rights. If a proposal is selected for a site-visit, a more detailed description of the lead institution's official policy will be required covering cross-disciplinary and multi-institutional activities of the Center, Center and subawardee staff, including faculty, visiting faculty, industrial fellows, postdoctoral researchers, and graduate and undergraduate students. Discussion should include the nature of the research, methodologies used, ownership of research and ideas, and roles and responsibilities regarding intellectual property. A program of ethics training within the cross-disciplinary and multi-institutional context of the Center, for all Center and subawardee staff, including faculty, visiting faculty, industrial fellows, postdoctoral researchers, graduate and undergraduate students, is required. Training topics should include the nature of the research, methodologies used, ownership of research and ideas, and roles and responsibilities regarding intellectual property.

(12) Shared Experimental Facilities (four-page limit). Where appropriate, describe the shared facilities to be established, including specific major research instrumentation, and plans for the development of new instrumentation. Describe plans for maintaining and operating the facilities, including staffing, provisions for user fees, and plans for ensuring shared access by all partners and outside users. Distinguish between existing facilities/instrumentation (and their location) and any that will be developed by the Center.

**Required Information to be submitted to NSF via FastLane in the Single Copy Documents Section**

(13) Projected Committed Funding by Source (one-page limit). Produce a table using the format shown in Table 1 (below). Indicate the expected annual level of total support committed from each source (i.e., NSF, academic institutions, industry, state and local governments, other federal agencies, international and other sources). For each of the five years, indicate whether the support is cash, or in-kind (space, faculty and staff positions, time of industrial personnel spent in the Center, capital equipment, and other in-kind commitments).

**TABLE 1.**

	<b>Year 1</b>		<b>Year 2</b>		<b>Year 3</b>		<b>Year 4</b>		<b>Year 5</b>	
<b>Committed Funding</b>	Cash \$	In-Kind \$								

<b>NSF</b>										
<b>Academic Institutions</b> <i>(include each contributor)</i>										
<b>Industry</b>										
<b>State/Local Govt.</b>										
<b>Other Federal Agencies</b>										
<b>International</b>										
<b>Total</b>										

(14) Institutional and other Sector Support (one-page limit). Outline the lead institution's commitment: dollars, space (new space and/or renovations to existing facilities), faculty and staff positions, capital equipment, and access to facilities and instrumentation. Major commitments of partner institutions should also be provided. Indicate dollar value where possible; otherwise, describe how the commitment contributes to realizing the strategic goals of the integrated Center. Describe other-sector support that has been committed, including space, funds, facilities, and personnel for the Center.

(15) Information for items (15.a) and (15.b) should be entered in the Single Copy Document section of FastLane "List of Personnel, Collaborators, and Affiliates".

(15.a) Project Personnel (update the information that was provided in the preliminary proposal and in Section (10.b) above.

(15.b) List of Collaborators/Individuals with Conflicts of Interest. Update the names (first name, last name, affiliation) of all persons, participants and affiliates with conflicts of interest as specified in Section II.C.5.e.i-iii of the NSF GPG. Specifically, include the following for each person listed on the project personnel list: all co-authors and collaborators (within the past 48 months); all graduate advisors and advisees; individuals who would act as external advisory committee members for the proposed Center; name all subcontractors who would receive funds through the Center.

No other items are to be included in the full proposal. Full proposals containing items other than those described above will not be reviewed.

Proposers are reminded to identify the program announcement/solicitation number (03-550) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

**B. Budgetary Information**

**Cost Sharing:**

Proposed STC annual budgets may range from \$1.5M to \$4.0M per year of NSF support. Preliminary proposals and full proposals outside this range will be ineligible and will not be reviewed or considered for support.

For eligibility purposes, cost sharing at a level of 30% of the requested total amount of NSF funds (no more, no less) is required for all preliminary and full proposals submitted in response to this solicitation. Cost sharing will be required at a level of 30% of the total amount provided by NSF (no more, no less) for any STC funded by NSF. Preliminary proposals and full proposals without the required amount of cost sharing will be ineligible and will not be reviewed or considered for funding.

The lead institution of the STC is responsible for the full cost sharing required. The full cost shared amount may be derived from any number of non-federal sources, but the lead institution must ultimately certify that the full amount is available. The preliminary and full proposal must provide details showing all sources and amounts of cost sharing. The cost sharing must be described in the proposal in sufficient detail to allow NSF to determine its impact on the proposed project. The core budget for the Center is expected to include support for all research, education, and knowledge transfer activities including, if proposed, those for undergraduate students and for teachers.

Letters of commitment or general support may not be submitted.

The proposed cost sharing must be shown on Line M on the proposal budget. Documentation of the availability of cost sharing must be included in the proposal. Only items which would be allowable under the applicable cost principles, if charged to the project, may be included as the awardee's contribution to cost sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in-kind (see OMB Circular A-110, Section 23). It should be noted that contributions counted as cost-sharing toward projects of another Federal agency may not be counted towards meeting the specific cost-sharing requirements of the NSF award. All cost-sharing amounts are subject to audit. Failure to provide the level of cost-sharing reflected in the approved award budget may result in termination of the NSF award, disallowance of award costs and/or refund of award funds to NSF.

#### **Indirect Cost (F&A) Limitations:**

Not applicable.

#### **C. Due Dates**

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

##### **Preliminary Proposals (required):**

June 03, 2003

Preliminary proposals are due by 5:00 p.m. local time of the submitting institution.

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

February 10, 2004

Full proposals are by invitation only.

The next STC competition is expected to start three years from this competition.

#### **D. FastLane Requirements**

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Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at

1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

*Submission of Electronically Signed Cover Sheets.* The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

## VI. PROPOSAL REVIEW INFORMATION

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### A. NSF Proposal Review Process

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

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

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

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

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

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

#### **What is the intellectual merit of the proposed activity?**

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

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

**What are the broader impacts of the proposed activity?**

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

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

***Integration of Research and Education***

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

***Integrating Diversity into NSF Programs, Projects, and Activities***

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

**Additional Review Criteria**

For preliminary proposals and full proposals, excellence must be demonstrated in all aspects of each of the above criteria, as well as the following criteria specific to the STC Program: (1) the value-added of funding the activity as a Center; (2) the potential effectiveness of the proposed leadership and management plans; and (3) the integrated nature of the proposed Center's research, education, and knowledge transfer activities.

(1) Value-added of funding the activity as a Center:

Are the identified science and technology challenges of sufficient import, scale, and complexity to justify a center-mode type of investment? Will the proposed Center provide an environment to enable discovery, learning and innovation? Will the Center's research and educational programs make a special contribution to the achievement of a diverse, highly competent, and globally-engaged technical and instructional workforce, and of an educated citizenry? Will any proposed new instruments, shared experimental facilities, and/or databases be of significant value to a broad community of users? Will the Center's partnerships achieve significant intellectual exchange and resource linkage with the school, public, industry, federal, and/or international sectors and thereby foster science and technology in service to society?

(2) Proposed Leadership and Management Plan:

Do the Center Director and the Center management team convincingly demonstrate the vision, experience, and capacity to manage a complex, multi-faceted, and innovative research, education, and knowledge transfer enterprise? What is the succession plan for leadership of the Center? What is the likely effectiveness of the proposed management plan, including the mechanisms for topic selection, resource allocation, progress evaluation, and project termination? Is there documentation of institutional and other commitments to the proposed Center? Is the requested budget appropriate for the scope and complexity of the research, education and knowledge transfer projects proposed?

### (3) Integrative Nature of the Proposed Center:

Are the research, educational, and knowledge transfer activities strategically integrated such that the whole is greater than the sum of the parts? Do the partners and participants have an essential role and share goals appropriately in the integrated Center? Does the Center structure promote organizational connections and linkages within and between campuses, schools or the world beyond?

### **STC Proposal Review Process for Preliminary and Full Proposals**

The STC Program will evaluate proposals in a multi-phase merit review process. In order to reduce the cost of proposal preparation and the workload on the scientific community, NSF will utilize a preliminary proposal phase. Preliminary proposals will be evaluated by panels of individuals intellectually distinguished in their fields and experienced in integrative science, mathematics, engineering and technology research, and education partnerships. The panelists will be asked to base their comments on the review criteria described above and to give special attention to vision and potential impact of the research proposed. NSF will notify applicants of the results of the preliminary proposal competition on or before October 15, 2003.

Proposing institutions whose preliminary proposals are judged most promising and are recommended by the panel will be invited to submit full proposals that will be evaluated by both ad hoc mail and panel review using the selection criteria listed above with special attention given to the integrative nature of the proposed Center. Full proposals will be accepted only by invitation. The full proposal review panel will use the above criteria to identify a small number of full proposals deemed worthy of site-visit reviews; the other proposals will be declined. NSF will notify all invited proposers as to whether they will be declined or site-visited by May 2004.

### **Site Visit Review Criteria and Award Selection Process**

For proposals that are selected for a site visit, the site visit review will consider the above criteria and the vision and potential legacy of the proposed center. It will focus on unresolved issues identified earlier in the review process, and will give special attention to the proposed plans for management and leadership of the Center. Foundation staff will provide additional information regarding the site visit review in advance of the meeting.

A comprehensive review of all proposals that are site-visited will be conducted by an external ad hoc STC Advisory Committee. The Advisory Committee will provide a brief statement and will develop a list recommending proposals in priority order to be funded by NSF. In developing its recommendations for awards, this committee will consider: the relative merit of the STC proposals using the criteria listed above, the potential national impact and legacy of the proposed activity, the balance of awards among scientific fields, geographical distribution, and the combined ability of the proposed Centers to meet the objectives of the STC Program. In developing funding recommendations to the Director and the Director's Review Board, NSF management will consider the STC Advisory Committee's recommendations. NSF expects to announce the final results of this STC competition around March 2005.

## **B. Review Protocol and Associated Customer Service Standard**

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All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Preliminary proposals and invited full proposals submitted in response to this solicitation will be reviewed as described herein. .

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

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of

the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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

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

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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

### B. Award Conditions

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

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

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

### Special Award Conditions:

STC awards are made in the form of Cooperative Agreements. The STC Cooperative Agreements will have an extensive section of Special Conditions relating to the period of performance, statement of work, awardee responsibilities, NSF responsibilities, joint NSF-awardee responsibilities, funding and funding schedule, reporting requirements, key personnel, and other conditions. NSF has responsibility for providing

general oversight and monitoring of STCs to help assure effective performance and administration, as well as facilitating any coordination among the STCs as necessary to further the objectives of the STC program. Prior to finalizing the Cooperative Agreement, a retreat of the Center's key personnel to address strategic planning of the STC will be required.

### **C. Reporting Requirements**

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

Centers awarded a Cooperative Agreement will be required to submit annual reports on progress and plans, which will be used as a basis for performance review and determining the level of continued funding. To support this review and the management of a Center, STCs will also be required to develop a set of management and performance indicators for submission annually to NSF via an NSF evaluation technical assistance contractor. Part of this reporting will take the form of a database that will be owned by the institution and eventually made available to an evaluation contractor. This database will capture specific information to demonstrate progress towards achieving the goals of the program. Such reporting requirements will be included in the Cooperative Agreement which is binding between the academic institution and the NSF.

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

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

### **VIII. CONTACTS FOR ADDITIONAL INFORMATION**

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General inquiries regarding this program should be made to:

- Margaret E.M. Tolbert, Senior Advisor, Office of the Director, Office of Integrative Activities, 1270 N, telephone: (703) 292-8040, fax: (703) 292-9040, email: [mtolbert@nsf.gov](mailto:mtolbert@nsf.gov)

General questions pertaining to this solicitation may be sent electronically to [stc@nsf.gov](mailto:stc@nsf.gov).

Office of Integrative Activities, Science and Technology Centers (STC): Integrative Partnerships Program  
National Science Foundation Room 1270 4201 Wilson Boulevard Arlington, VA 22230, telephone: 703-292-8040

For questions related to the use of FastLane, contact:

- Office of Integrative Activities, telephone: 703-292-8040, email: [oiarep@nsf.gov](mailto:oiarep@nsf.gov)
- FastLane Help Desk, telephone: 1-800-673-6188, email: [fastlane@nsf.gov](mailto:fastlane@nsf.gov)

### **IX. OTHER PROGRAMS OF INTEREST**

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

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (703) 292-5111  
(NSF Information Center):
- **TDD (for the hearing-impaired):** (703) 292-5090
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  - or telephone: (301) 947-2722
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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