

Chemical Bonding Centers Phase II (CBC-II)

Chemistry as the Driver for Transformative Research and Innovation

Program Solicitation

NSF 06-558



National Science Foundation

Directorate for Mathematical and Physical Sciences

Division of Chemistry

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

August 31, 2006

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Chemical Bonding Centers Phase II (CBC-II)
Chemistry as the Driver for Transformative Research and Innovation

Synopsis of Program:

The Chemical Bonding Centers (CBC) Program is designed to support the formation of centers that can address major, long-term basic chemical research problems. Appropriate research problems are high-risk but potentially high-impact because they will attract broad scientific and public interest. Centers are expected to be agile structures that can respond rapidly to emerging opportunities and make full use of cyberinfrastructure to enhance collaborations. Center teams may include researchers from other disciplines and from academia, industry, government laboratories and international organizations. CBCs are expected to integrate research, education, diversity, and outreach. Proposals should contain a compelling strategy for achieving demonstrable impact in all of these areas.

The CBC program is a two-phase program. In the first phase, Massachusetts General Hospital, the University of California at Santa Barbara, and the University of Washington were lead institutions funded by NSF in FY 2004 to explore the development of CBCs. The second phase is to provide funding for implementation of full-scale centers in FY 2007. Only these development teams are eligible to participate in Phase II of the competition by submitting a proposal for the establishment of a full CBC.

Cognizant Program Officer(s):

- Katharine J. Covert, Program Director, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4950, fax: (703) 292-9037, email: kcovert@nsf.gov
- Janice M. Hicks, Executive Officer, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4956, fax: (703) 292-9037, email: jhicks@nsf.gov

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

- 47.049 --- Mathematical and Physical Sciences

Eligibility Information

• Organization Limit:

The eligible institutions are those funded in the CBC Phase I program under proposals submitted by Massachusetts General Hospital, the University of California at Santa Barbara, and the University of Washington.

- **PI Eligibility Limit:**

An investigator may participate (as a PI, co-PI or senior personnel) in only one CBC proposal submitted to this competition. The PI must be affiliated with a U.S. academic institution or non-profit research organization. Other investigators may be affiliated with U.S. academic institutions, non-profit research organizations, industry, government laboratories and international organizations. Unaffiliated scientists may also be eligible for support under a proposal submitted by an eligible organization. CBC award funds may not go directly to industry, government laboratories or international organizations. The PI listed on the cover sheet must be affiliated with the proposing institution. While these proposals will reflect the research of many investigators, only the name of the PI, and no names of Co-PIs, should appear on the cover sheet.

- **Limit on Number of Proposals:** Only one proposal may be submitted per eligible institution.

Award Information

- **Anticipated Type of Award:** Cooperative Agreement
- **Estimated Number of Awards:** 1 to 2 - Cooperative Agreement(s) with an initial commitment of five years and a potential duration of ten years
- **Anticipated Funding Amount:** \$3,000,000-\$6,000,000 pending availability of funds.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. submitter's local time):
August 31, 2006

Proposal Review Information

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

Award Administration Information

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

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I. INTRODUCTION

The Division of Chemistry is initiating a Phase II competition for Chemical Bonding Centers (CBCs) to capitalize on advances in addressing major intellectual challenges in basic chemical research that were achieved in CBC Phase I projects. These Phase II CBCs will continue to provide the opportunity for especially able and imaginative groups of investigators to share a commitment toward solving a "big problem" in an atmosphere having a high tolerance for risk and within a structure permitting considerable agility. A workshop at NSF, "New Mechanisms for Support of High-Risk and Unconventional Research in Chemistry," explored mechanisms for encouraging and supporting such initiatives. A report of the workshop can be obtained at <http://www.mrl.uiuc.edu/docs/nsfgmwfina.pdf>.

The Division of Chemistry expects to make one or more awards in Fiscal Year (FY) 2007 to support Phase II of the Chemical Bonding Centers (CBC) Program. Each Phase II award is expected to have a duration of five years, at a level averaging \$3 million per year, with possible renewal for a second five-year period at the same average level of \$3 million per year pending availability of funds.

II. PROGRAM DESCRIPTION

Background. The CBC Program is based on a staged competition. Three developmental proposals outlining center's goals were funded in FY 2004 with three-year awards at a level of \$500,000 per year. Each of the teams receiving these awards is eligible to participate in Phase II of the competition by submitting a proposal for the establishment of a full CBC.

CBC- II. The CBC Program is designed to support the formation of centers that can address major, long-term basic chemical research problems. Appropriate research problems are high-risk but potentially high-impact because they will attract broad scientific and public interest. Centers are expected to be agile structures that can respond rapidly to emerging opportunities and make full use of cyberinfrastructure to enhance collaborations. Center teams may include researchers from other disciplines and from academia, industry, government laboratories and international organizations. Team sizes will reflect the needs of the problem to be studied, but a minimum of three investigators is required. Team sizes may be different from those in the corresponding CBC Phase I projects.

It is anticipated that successful centers will involve novel research centered in the chemical sciences and aimed at solving high-risk, long-term problems of large scope and impact. It is expected that these CBC Phase II projects will continue the development of new areas of research and new communities of scientists and engineers that were initiated in Phase I. These communities will bring common and complementary interests into productive contact to nurture a culture of risk-taking and innovation around structures that are agile and take full advantage of cyberinfrastructure for fostering collaborations. The awards made under the CBC Program are expected to continue innovative plans to make chemistry and chemists more visible to the broader scientific community and to the public.

CBCs are expected to integrate research and education throughout the course of the project. CBCs should provide novel opportunities for participants to engage in joint efforts that combine education with the excitement of discovery at the frontiers of modern chemical research. CBCs should contain strong diversity and outreach components. There must be a commitment to broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- in the solution of these "big problems." A vigorous outreach program should be designed to achieve the CBC goal of increasing public appreciation for the contributions of chemistry to progress in modern science.

Examples of possible CBC outcomes are:

- The emergence of new areas of chemical inquiry;
- The solution of problems in basic chemical research beyond the scope of individual investigators and/or single disciplines that have broad scientific impact;
- The emergence of innovative, high-risk, cyber-enabled science; and

- An enhanced favorable perception of chemistry and chemists by the broader scientific community and by the public.

During preparation of a CBC Phase II proposal, investigators are strongly urged to discuss details with a cognizant Program Officer listed in Section VII of this solicitation. Investigators contemplating the involvement of industrial, government and/or international team members will need to provide an institutional letter of collaboration from the partner organization that confirms the participation of a co-investigator. This letter should be included in the Supplementary Documents Section of the Full Proposal. (See Section V.A., below). The letter should describe the plan of interaction with the U.S. academic institution, the time commitment of the researcher(s), and the nature of the collaborative research activities. Letters of general support or recommendation are inappropriate and may cause a proposal to be returned without review. Cost sharing is not required for Phase II proposals.

Support for collaborations with international scientists is provided through the NSF grant to the submitting U.S. institution. No CBC award funds may go directly to foreign institutions. The proposal may include up to \$500,000 in participant support costs, over the duration of the grant, for international collaborative research activities. Travel and incidental research costs may be included; salaries may not. These international collaborations must feature a joint scientific work plan and should be clearly described in the Project Description. If, after review, a proposal is recommended for funding, the cognizant Program Officer will work with Program Officers from the NSF Office of International Science and Engineering and the key project personnel to develop a detailed plan consistent with applicable international arrangements.

Co-investigators associated with entities such as industry, state agencies and national laboratories (Federally Funded Research and Development Centers (FFRDCs)) must be supported by their own organization. However, it is appropriate for students supported through universities to work at a partner industrial laboratory, FFRDC or comparable site, or for universities to fund research expenses incurred when scientists from such entities work at university sites. Federal employees may not receive salaries or in other ways augment their agency's appropriation through grants made by this program, and no funds for major equipment at FFRDC's are allowed.

Principal Investigators should ensure that their proposed project does not substantially overlap with ongoing Federally funded research. Additional information is available through the NSF Guide to Programs (<http://www.nsf.gov/pubsys/ods/getpub.cfm?gpg>). NSF reserves the right to return without review proposals that are not appropriate for the CBC Program.

III. ELIGIBILITY INFORMATION

- **Organization Limit:** The eligible institutions are those funded in the CBC Phase I program under proposals submitted by Massachusetts General Hospital, the University of California at Santa Barbara, and the University of Washington.
- **PI Eligibility Limit:** An investigator may participate (as a PI, co-PI or senior personnel) in only one CBC proposal submitted to this competition. The PI must be affiliated with a U.S. academic institution or non-profit research organization. Other investigators may be affiliated with U.S. academic institutions, non-profit research organizations, industry, government laboratories and international organizations. Unaffiliated scientists may also be eligible for support under a proposal submitted by an eligible organization. CBC award funds may not go directly to industry, government laboratories or international organizations. The PI listed on the cover sheet must be affiliated with the proposing institution. While these proposals will reflect the research of many investigators, only the name of the PI, and no names of Co-PIs, should appear on the cover sheet.
- **Limit on Number of Proposals:** Only one proposal may be submitted per eligible institution.

IV. AWARD INFORMATION

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

- **Anticipated Type of Award:** Cooperative Agreement.
- **Estimated Number of Awards:** 1 to 2 - Cooperative Agreement(s) with an initial commitment of five years and a potential duration of ten years.
- **Anticipated Funding Amount:** \$3,000,000-\$6,000,000 pending availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines

contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

Proposals submitted in response to this program solicitation must originate from teams whose projects were successful in the CBC Phase I competition in FY 2004 and be based on those projects. The lead institutions funded in that competition were Massachusetts General Hospital, the University of California at Santa Barbara, and the University of Washington. All proposals not meeting this requirement will be returned without review.

Proposers are strongly encouraged to consult the proposal submission checklist included in the Grant Proposal Guide as they prepare their proposal. Proposals not compliant with the proposal preparation guidelines, as supplemented by the following instructions, may be returned without review.

The items outlined below pertain to the corresponding sections in the Grant Proposal Guide.

- Project Summary. One-page limit, including the names and affiliations of all senior personnel. The project summary must address both the intellectual merit and broader impacts of the proposed CBC-II project.
- Project Description. A total of up to twenty-eight (28) pages: i) Results from CBC Phase I Support (up to 5 pages), ii) Proposed Research (up to 15 pages), iii) Modes of Dissemination and Education (up to 2 pages), iv) Diversity Plan (up to 2 pages), v) Outreach Plan (up to 2 pages), and vi) Management Plan (up to 2 pages).

i. Prior Support. Following the Grant Proposal Guide, a report on the results from the CBC Phase I program, up to a total of five (5) pages. No other results from prior support should be included.

ii. Proposed Research. Narrative, not to exceed fifteen (15) pages, consisting of the following items:

An explanation of the scientific context, intellectual merit, relevance to chemistry and timeliness of the proposed project;

A description of the proposed research;

A discussion of the broader impacts of the proposed work;

A discussion of why a transition from a Phase I to a Phase II Center is justified;

A discussion of the mode of collaboration with description of any use of cyberinfrastructure; and

A description of the contribution to be made by each senior investigator.

iii. Modes of Dissemination and Education. Narrative, not to exceed two (2) pages, describing:

The mode of training undergraduate students, graduate students, and postdoctoral researchers, including co-mentorship or other collaborative training; and

Plans for dissemination and education.

iv. Diversity Plan not to exceed two (2) pages, describing:

The diversity goals to be achieved;

Plans for achieving those goals; and

A discussion of how progress toward diversity will be measured.

v. Outreach Plan not to exceed two (2) pages, describing:

Plans to capture the imagination of the public;

Plans to increase the visibility and public appreciation of chemistry; and

A discussion of ways to assess the impact of outreach efforts.

vi. Management Plan. Narrative, not to exceed two (2) pages, describing:

How the group effort will be coordinated, including any use of cyberinfrastructure;

How decisions will be made regarding the conduct of the project;

A discussion of how agility will be addressed in terms of the incorporation of new ideas, tools and partners; and

How the collaboration will be evaluated.

- **References Cited.** References should include full titles of articles and book chapters cited. This section should include bibliographic citations only and must not be used to provide parenthetical information outside of the Project Description. Indicate with an asterisk (*) references from work on the CBC Phase I project.
- **Biographical sketches.** For PI/Co-PIs and all senior personnel, provide brief biographical sketches using the format described in the Grant Proposal Guide. Note that recent collaborators and other affiliates should also be collected into the combined list given in the Supplementary Documents section (below).
- **Budget.** Include five annual budgets, one for each year of the duration of the award; a cumulative budget will be automatically generated by the Fast Lane system. A detailed budget justification (up to three pages) should document proposed expenses. Multi-institutional proposals should use the award-sub award proposal mechanisms (see GPG guidelines, chapter II.D.3).
- **Current and Pending Support.** A full description of the total level of current and pending support from all sources for the key personnel. Any intellectual overlap between federally funded projects and the proposed research must be clarified.
- **Facilities.** A description of the facilities (including laboratories, computational facilities and cyberinfrastructure) that will be made available to the project. Separate facilities descriptions should be included for multi-institutional projects or those involving non-academic partners.
- **Supplementary Documents.** Required letters of collaboration from national laboratories, international organizations, and industry should be included in this section. Letters of collaboration from senior personnel not supported on the grant are also appropriate. Letters of recommendation or general support are not permitted.
- A combined, alphabetized list of all scientists, with current affiliations, who have collaborated with the PI, co-PIs and other senior personnel in the last 48 months or are otherwise affiliated with them should be included as a single copy document.

Proposers are reminded to identify the program announcement/solicitation number (06-558) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

Other Budgetary Limitations:

Proposals should include funds in the budget for CBC personnel to participate in site visits or reverse site visits in the second and fourth years of the project.

The proposal may include up to \$500,000 in participant support costs, over the duration of the grant, for international collaborative research activities. Travel and incidental research costs may be included; salaries may not.

Budget Preparation Instructions:

Multi-institutional proposals should use the award-subaward mechanism discussed in the GPG, Chapter II.D.3. A single proposal and budget should be submitted, with subawards administered by the lead institution.

C. Due Dates

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

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

August 31, 2006

D. FastLane Requirements

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

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

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

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

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

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

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

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

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

What is the intellectual merit of the proposed activity?

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

What are the broader impacts of the proposed activity?

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

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

Integration of Research and Education

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

discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

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

Additional Review Criteria:

In addition to the National Science Board merit review criteria, reviewers will be asked to apply the following criteria when reviewing CBC Phase II proposals:

- Does the proposal present a convincing argument that transition from Phase I to Phase II will lead to significant new progress in addressing a "big problem"?
- Will the project lead to a major advance in chemistry and/or at the interface of chemistry and other sciences?
- Are the scientific goals appropriate for a full-scale CBC?
- Does the project build upon novel and significant results achieved in Phase I?
- Is there capacity for agility and evolution as the center develops and matures?
- Does the project have the potential to attract broad scientific and public interest and support?
- Will the plans for education, dissemination, diversity, outreach, management and use of cyberinfrastructure be effective?
- Does the proposal have the potential to lead to transformative research and innovation in chemistry and related fields?

B. Review Protocol and Associated Customer Service Standard

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

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

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

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

Consistent with the requirements of OMB Circular A-16, *Coordination of Geographic Information and Related Spatial Data Activities*, and the Federal Geographic Data Committee, all NSF awards that result in relevant geospatial data must be submitted to Geospatial One-Stop in accordance with the guidelines provided at: www.geodata.gov.

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

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

C. Reporting Requirements

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

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

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

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Katharine J. Covert, Program Director, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4950, fax: (703) 292-9037, email: kcovert@nsf.gov
- Janice M. Hicks, Executive Officer, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4956, fax: (703) 292-9037, email: jhicks@nsf.gov

For questions related to the use of FastLane, contact:

- Paul G. Spyropoulos, Computer Specialist, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4968, fax: (703) 292-9037, email: pspyropo@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

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

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF *E-Bulletin*, which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program

announcements/solicitations. Subscribers can also sign up for NSF's [MyNSF News Service](http://www.nsf.gov/mynsf/) (<http://www.nsf.gov/mynsf/>) to be notified of new funding opportunities that become available.

Related Programs:

- Collaborative Research in Chemistry ([NSF 05-606](#))
- Environmental Molecular Science Institutes ([NSF 04-509](#))
- Materials Research Science and Engineering Centers ([NSF 04-580](#))

Science and Technology Centers: Integrative Partnerships

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (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** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: pubs@nsf.gov
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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