

Cyberinfrastructure for the Biological Sciences: Plant Science Cyberinfrastructure Collaborative (PSCIC)

Program Solicitation

NSF 06-594



National Science Foundation

Directorate for Biological Sciences
Emerging Frontiers

Preliminary Proposal Due Date(s) (required):

November 30, 2006

Full Proposal Target Date(s):

April 16, 2007

By Invitation Only

REVISION NOTES

In furtherance of the President's Management Agenda, in Fiscal Year 2006, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system.

A prospective Principal Investigator meeting will be held in August 2006 at NSF. For details, contact Dr. Chris Greer, Program Director, Directorate for Biological Sciences, email: cgreer@nsf.gov; telephone: (703) 292-8470.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Plant Science Cyberinfrastructure Collaborative (PSCIC)

Synopsis of Program:

The goal of this program is to create a new type of organization – a cyberinfrastructure collaborative for plant science – that will enable new conceptual advances through integrative, computational thinking. The collaborative will be fluid and dynamic, utilizing new computer, computational science and cyberinfrastructure solutions to address an evolving array of grand challenge questions in plant science. The collaborative will be community-driven, involving plant biologists, computer and information scientists and experts from other disciplines working in integrated teams.

The driving force and organizing principles for the collaborative are the grand challenge questions in plant science. The primary means the collaborative will use to pursue these questions are synthesis activities, such as working/task groups that operate on and off-site, virtual groups that interact remotely, postdoctoral and student fellows, visiting scientists, and the provision of networking and cyberinfrastructure resources that promote broad interaction and participation. The central resources of the collaborative will be computational and cyberinfrastructure capabilities and expertise that are capable of handling large and heterogeneous plant biology data sets. These resources will be used to craft solutions to an evolving array of grand challenge questions. The collaborative will have a small core of staff members to support the activities of collaborative participants working in real and virtual modes. Resident social scientists will assess how the members of the collaborative community are interacting and using collaborative resources.

The structure of the collaborative may be centralized or distributed, such as a central hub with several branches. Proposals submitted in response to this solicitation must therefore present a clear description of the capabilities, responsibilities, and characteristics of the collaborative and a management plan designed to provide strong, central leadership.

Cognizant Program Officer(s):

- Christopher Greer, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, telephone: (703) 292-8470, email: psscic@nsf.gov

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

- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1 One award with a budget of up to \$10,000,000 per year for up to 5 years is anticipated, contingent on the quality of proposals received and pending the availability of funds.

Anticipated Funding Amount: \$50,000,000 over 5 years. The initial term of the award is expected to be 5 years, with the potential for one terminal renewal for another 5 years, subject to performance and availability of funds. Note that the maximum period NSF will support the collaborative is 10 years.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- U.S. academic institutions, U.S. non-profit research organizations that are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities are eligible to submit proposals in response to this program solicitation. When a consortium of organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees. Organizations ineligible to submit to this program solicitation cannot receive subawards.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposals:**
 - Full Proposals submitted via FastLane: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
 - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf/>)

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required 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

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

November 30, 2006

- **Full Proposal Target Date(s):**

April 16, 2007

By Invitation Only

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: 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

The National Science Foundation (NSF) and its Directorate for Biological Sciences (BIO) consider cyberinfrastructure a key factor in ensuring American competitiveness in science and engineering. Advances in cyberinfrastructure are changing the ways in which research and education are conducted and are eliminating barriers to participation in the scientific enterprise.

Biological research today is increasingly interdisciplinary and quantitative. New frameworks for research and education are being built on a foundation of strong expertise in wide-ranging fields that are being woven together to develop novel approaches and strategies. These frameworks combine theory, simulation, and experiments in a coordinated way to address the grand challenges in biology. Since Cyberinfrastructure is key to enabling these powerful new approaches, BIO envisions supporting a broad spectrum of activities ranging from the acquisition of hardware to the development of novel cyber resources, tools and services to enable the biological science community to take full advantage of cyberinfrastructure in its research and educational endeavors.

Key among these activities is the development of a new type of cyberinfrastructure as described in the NSF report, "Revolutionizing Science and Engineering through Cyberinfrastructure" (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=cise051203). In this report, a Blue Ribbon Advisory Panel envisioned new types of scientific organizations and environments enabled by cyberinfrastructure that "serve individuals, teams, and organizations in ways that revolutionize what they can do, how they do it, and who participates."

In the biological sciences, a central function of a cyberinfrastructure collaborative is to create intellectual synergy among biologists, computer and information scientists, mathematicians, engineers, and others to drive discovery. By providing a forum for interaction and the resources and expertise for collaborative analyses, such collaboratives will allow biologists to articulate for their colleagues in other fields the biological questions that present fundamental computational, informational, or engineering challenges requiring innovative solutions. Consequently, BIO announces its intention to support the establishment of a Plant Science Cyberinfrastructure Collaborative (PSCIC).

The selection of plant science as a focus for the collaborative is based on several considerations. The PSCIC will fulfill one of the major objectives of the National Plant Genome Initiative's (NPGI) five-year plan for 2003-2008 (<http://www.ostp.gov/NSTC/html/npgi2003/index.htm>). A series of plant science community workshops and reports identified cyberinfrastructure as critical to further progress. These include the recent reports of the Plant Cyberinfrastructure Collaborative Workshop (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=biortp032206) and the Mid-course Assessment of the Arabidopsis 2010 Project (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=bio0601) as well as a white paper on plant science database needs (<http://www.gramene.org/>). Finally, a large and heterogeneous array of information resources for plant science, including genome-scale information (e.g., whole genome sequences and annotations), extensive phenotypic data sets (e.g., gene expression profiles), genetic resources (e.g., sequence-catalogued collection of mutants), functional genomics assets (e.g., high-throughput deletion and RNAi sets), as well as informatics resources (e.g., software tools, databases), now exist. These resources can only be fully used to advance discovery if they can be easily accessed, understood, and used in novel combinations by all in the research and education communities. The PSCIC is designed to facilitate this process.

The structure of the collaborative may be centralized or distributed, such as a central hub with several branches. Proposals submitted in response to this solicitation must therefore present a clear description of the capabilities, responsibilities, and characteristics of the collaborative and a management plan designed to provide strong, central leadership.

II. PROGRAM DESCRIPTION

The goal of this program is to create a new type of organization – a cyberinfrastructure collaborative for plant science – that will enable new conceptual advances through integrative, computational thinking. The Collaborative will be fluid and dynamic, utilizing new computer, computational science, and cyberinfrastructure solutions to address an evolving array of grand challenge questions in plant science. The Collaborative will be community driven, involving plant biologists, computer and information scientists, and experts from other disciplines working in integrated teams.

The Collaborative will be a new type of organization that will:

1. Foster computational thinking in Biology through the a priori integration of the activities of biologists and computer and information scientists.
2. Be an institution by, for, and of the community. It will enable the research community to identify, develop and pursue grand challenge questions. The Collaborative will have a small core staff to support the activities of teams of biologists, computational and computer scientists, and researchers from other disciplines. It will support social scientists to assess how the research community is using Collaborative resources and interacting with one another.
3. Remain at the leading edge of plant science, computer and information science and cyberinfrastructure. To achieve this, the Collaborative will be composed of scientists conducting interdisciplinary research in all of these fields.
4. Constantly reinvent itself and its capabilities. By addressing contemporary challenges in plant science, the Collaborative will identify new ones and develop the next-generation computation and cyberinfrastructure capabilities required to address the new challenges.

The driving force and organizing principles for the Collaborative are the grand challenge questions in plant science. The primary means that Collaborative participants will use to address these questions are synthesis activities. The central resources that the Collaborative will provide to users are computational and cyberinfrastructure capabilities and expertise. These elements are described in greater detail below.

Driving force and organizing principles – The goal of the Collaborative is to enable researchers to pursue grand challenge questions in plant science. Such questions might include, but are not limited to: How does a small set of cells give rise to all the aboveground structures of a plant? How do plants interact with and influence their environment and the organisms around them? How did plants evolve from aquatic to terrestrial organisms? Addressing questions of this complexity requires the ability to integrate large and vastly different data sets (from molecular structure, through organismal physiology to population dynamics, or from gene sequence data through genes expression profiles in every cell type throughout plant development under different growth conditions), a way to integrate concepts and approaches from all areas of Biology with those from computational and information sciences, mathematics, physics, chemistry, engineering and other fields, and models and simulations that cross physical scales from angstroms to kilometers at time scales from femtoseconds to eons.

All facets of the Collaborative, including the nature of its activities, the composition of participant groups, and its computational and cyberinfrastructure resources will be organized around selected grand challenge questions. As the questions are resolved or change, the Collaborative will necessarily change with them, engaging new groups of participants, implementing new technologies and computational and analytical strategies, and designing new communication and visualization approaches tailored to the types of data, strategies, and approaches necessary for the questions then under investigation.

Synthesis Activities – The Collaborative will achieve its goals through the integration of the activities of biologists, computer and information scientists, mathematicians, engineers and other experts appropriate to specific grand challenge questions. These activities could include working/task groups that operate on and off-site, virtual groups that interact remotely, postdoctoral and student fellows, and visiting scientists.

Leading Edge Computational Capability – It is not required that the Collaborative have terascale, or in the future petascale, capability. While these may be long-term goals of the Collaborative, it is beyond the scope of this solicitation. (For NSF activities in the tera and peta scale range see NSF 05-625 at <http://www.nsf.gov/pubs/2005/nsf05625/nsf05625.htm>). Instead, the Collaborative should make use of available high performance computing resources such as the Teragrid and the supercomputer centers when Collaborative researchers wish to pursue questions requiring computational resources at this scale. It is expected that the Collaborative will have sufficient computational capability to allow it to serve as an effective springboard to advanced tera and peta scale levels. To meet this requirement, the Collaborative must be capable of preparing applications, and the researchers who will use them, to eventually ramp up to tera-and peta-scale resources. This will require hardware, software, network fabric (resources for internal and external access, interaction, and communication), and expert support and administrative staff members capable of operating at levels that will enable the Collaborative to meet this goal.

It is expected that the Collaborative will stay at the frontier of computer and cyberinfrastructure science and engineering. The structure of the Collaborative, its budget, and its implementation plans must enable it to track new developments and implement the latest technologies, concepts and strategies arising at the leading edge of the relevant fields. This requires the active participation in Collaborative activities of computer and information scientists and engineers conducting research in their own fields that is relevant to Collaborative goals. As the knowledge base grows, the Collaborative and its participants will continuously craft new computational and other cyberinfrastructure solutions designed specifically to meet the needs of each grand challenge question the community addresses.

The Capabilities of the Collaborative

While innovation in Collaborative design is encouraged, proposals must address the following three core capabilities:

The Collaborative must provide exceptional computational capabilities and associated cyberinfrastructure resources for both local and remote users. These resources must be beyond what would normally be accessible to individuals or groups working on their own.

The core Collaborative staff members must function as a well-integrated team with expertise in computer and information sciences, plant science and other fields relevant to the activities Collaborative participants will undertake.

The Collaborative must have programs/activities that enable it to use its computational capabilities and resident expertise to support synthesis (used here to mean combining diverse information and concepts into a coherent whole, including data integration and simulation to inform experimentation) by external (non-Collaborative staff members) scientists working on-site and remotely.

Responsibilities of the Collaborative

The primary responsibilities of the Collaborative are to:

Catalyze progress by providing innovative computational and cyberinfrastructure solutions, facilitating ground-breaking plant science research by providing new ways to access, understand, connect, and evaluate complex data and information, integrating plant and information sciences, enabling effective remote use of Collaborative resources and preparing biological applications for eventual migration to advanced tera-and peta-scale resources.

Advance plant science through creative synthesis and integration by promoting interdisciplinary interaction and collaboration using a range of innovative mechanisms. Such mechanisms might include, but are not limited to, working groups, visiting faculty members/sabbaticals, postdoctoral and student fellows, workshops, etc.

Prepare the next generation by training a new generation of scientists to use cyberinfrastructure in innovative, interdisciplinary research, providing diverse mechanisms for training and education to engage a broad range of participants at various levels, including K-12 students and teachers, undergraduate and graduate students, postdoctoral scholars and career scientists.

Enable discovery through information access by supporting the development and continuous evolution of community-driven data and metadata standards and ontologies, encouraging data deposition and preservation through community-driven policy development and implementation, and developing tools and user interfaces that facilitate data collection and deposition.

Lead in outreach by promoting innovation in using cyberinfrastructure to reach out to a diverse population, facilitating community-driven research, evaluation and assessment of outreach mechanisms and best practices, employing a variety of mechanisms to remove barriers to participation by members of groups underrepresented in the scientific enterprise and individuals from diverse institutional and geographical settings.

Characteristics of the Collaborative

The Collaborative is expected to be:

Interdisciplinary. Bringing together experts from all fields that can contribute to answering the major challenges in plant biology, including individuals from all biological sub-disciplines, and the physical, mathematical, computational, and computer sciences.

Innovative. Developing leading edge cyberinfrastructure, new information science concepts and strategies and new modes of synthesis. Leading the adoption of new technologies, accommodating and integrating new data types, and encouraging emerging research concepts and opportunities.

Community-Driven. Operating as an extension of the research community, actively attracting input and participation from all elements of the community and responding to the needs and opportunities that the community identifies.

Accountable. Employing robust assessment mechanisms to evaluate the impacts, progress, responsiveness to the community, and effectiveness of the Collaborative in meeting its goals. Using clear metrics and milestones in evaluating performance. Engaging social scientists to evaluate the impact of the Collaborative on the integration of cyberinfrastructure into the plant science research paradigm and on the integration of ideas and individuals through Collaborative activities.

Diverse. Increasing the participation of women and individuals from groups underrepresented in science and engineering at all levels and in all Collaborative activities. The Collaborative will actively engage a diverse range of institutions such as minority serving institutions, community colleges, primarily undergraduate institutions, and encourage international collaboration.

Effectively Managed. Providing for effective leadership, efficient implementation, reliable oversight accountability, enabling a quick response to new opportunities and gauging community needs. External advisory groups will provide intellectual guidance, help to identify frontier opportunities in science, education and technology, and allow for a representative breadth of input and advice.

Collaborative Leadership

Strong central leadership is critical to the success of the Collaborative both for maintaining a clear vision and for balancing activities across the range of Collaborative responsibilities. For this reason, proposals that involve multiple organizations must be received as a single submission with one organization acting as the lead and all others as subawadees.

The Director of the Collaborative should have a broad vision, good familiarity with the appropriate range of science and technology, and the ability to lead and integrate diverse teams of faculty members, staff members, participants, students and others. The Director must be a recognized leader in research and education with proven managerial skills from prior experience leading and managing teams to achieve shared goals. Proposals should either identify an individual designated as Director or describe a recruitment and selection process to obtain a qualified individual who will fulfill these expectations.

A characteristic feature of the Collaborative will be the need to pursue a wide range of activities simultaneously. This will require an effective management plan with clear lines of responsibility and authority. Proposals should detail a management plan designed to enable the Collaborative to meet its full range of responsibilities, including leadership and reporting relationships.

In meeting its responsibility to act as an extension of the community, the Collaborative will need to maintain a variety of mechanisms for community input and interaction. Examples include advisory or oversight boards or committees. Proposals should describe the specific mechanisms that will be used to ensure that the Collaborative is fully engaged with the community and effective in identifying and responding to the needs, goals, and priorities of the community.

Additional Information

Existing synthesis centers and other relevant cyberinfrastructure:

NSF currently supports two synthesis centers including the National Center for Ecological Analysis and Synthesis (NCEAS; see <http://www.nceas.org>) and the National Evolutionary Synthesis Center (NESCent; see <http://www.nescent.org>). While the PSCIC represents the next generation synthesis collaborative, proposers should take advantage of lessons learned from these Centers in developing a concept for the PSCIC. In addition, proposers should coordinate planned activities with those of relevant extant cyberinfrastructure projects, e.g. the Protein Data Bank and NIH Centers, to avoid duplication of effort.

International Participants

The Collaborative may involve international participants and NSF encourages international collaboration. Collaborative funds may be used to support US investigators and students to work in international settings and foreign investigators and students to work in the US. However, foreign collaborators should secure support for their activities at their home or other non-US institutions from their own national sources.

III. AWARD INFORMATION

NSF plans to make one award as a cooperative agreement. The award budget is anticipated to be up to \$10,000,000 per year for up to 5 years, contingent on the quality of proposals received and pending the availability of funds. The anticipated award date is September 01, 2007. The initial term of the award is expected to be 5 years, with the potential for one terminal renewal for another 5 years, subject to performance and availability of funds. This will be determined after a full site visit review planned for the third year of the initial award. Note that the maximum period NSF will support the collaborative is 10 years. A plan for the transition of the collaborative and, if appropriate, disposition of its resources including databases when NSF funding ends is required. This requirement will be implemented through the cooperative agreement governing the award.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- U.S. academic institutions, U.S. non-profit research organizations that are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities are eligible to submit proposals in response to this program solicitation. When a consortium of organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees. Organizations ineligible to submit to this program solicitation cannot receive subawards.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals (*required*):

Submission of a preliminary proposal is required for eligibility to submit a full proposal. Preliminary proposals must be submitted via FastLane and must include the following:

- Information About Principal Investigators/Project Directors and Co-Principal Investigators/Co-Project Directors – Use standard GPG guidelines
- Fastlane Cover Sheet: Select this program solicitation number from the pull down list. Check the box for preliminary proposal. Entries on the Fastlane cover sheet are limited to the principal investigator/project director and a maximum of 4 co-principal investigators/project directors. All other senior project participants should be listed on the project summary page and entered into Fastlane as Senior Personnel (this latter provision allows their biographical sketches to be included in the Fastlane proposal).
- Title - The title of the proposal must begin with "PSCIC Preliminary Proposal:".
- Project Summary (1 page) - The summary must consist of 3 parts: (1) At the top of this page, indicate the title of the project, the name of the PI and the lead organization; and a list of Co-PIs, Senior Personnel, and Collaborators along with their organizations; (2) Provide a succinct summary of the intellectual merit including the vision and rationale for the collaborative and the cyberinfrastructure capabilities, range of expertise, and mechanisms for promoting intellectual synthesis that will be used in achieving that vision; and (3) describe the broader impacts of the proposed work, including approaches to achieve goals for innovation and leadership in outreach and education.
- Project Description - The project description is limited to a total of 7 pages and must address the following:
 - Vision and rationale for the Collaborative: Describe the over-arching vision for the Collaborative and how it will enable progress that could not be achieved by individuals and/or groups acting on their own.
 - Structure of the proposed collaborative (e.g., a single collaborative or a distributed collaborative) including its various organizational components.
 - Core infrastructure and staffing of the proposed Collaborative: Describe how the proposed core infrastructure and staffing can address each of the six "Responsibilities of the Collaborative" as described in Section II, Program Description.
- References Cited – Indicate with an asterisk any cited publications resulting from prior research funded by NSF for the PI or Co-PIs when following the GPG guidelines for all references cited.
- Biographical Sketches - Provide biographical sketches for the PI, Co-PIs, and other Senior Personnel listed on the Project Summary page.
- Current and Pending Support – Provide this information for the PI and Co-PIs.
- Budget – No budget is required. However, please enter \$2 in the Requested Amount box on the Fastlane Cover Sheet (this entry allows correct Fastlane processing).
- Special Information and Supplementary Documentation – The following additional information is required in addition to that allowed under the provisions of the GPG:
 - Key Personnel: Provide a list of key leadership personnel (maximum 3 pages), with a brief description of what each person uniquely brings to the collaborative.
 - Integrated conflicts of interests list: Provide a list, in a single alphabetized table, of the full names and institutional affiliations of all people with conflicts of interest for the PI, Co-PIs, and any named personnel whose salary is requested in the project budget. The table should specify the nature of the conflict including: (1) PhD thesis advisors or advisees; (2) collaborator or co-authors, including postdocs, for the past 48 months; and (3) any other individuals or institutions with which the PI or Co-PIs have financial ties, including advisory committees.

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing

guidelines. Failure to submit this information may delay processing.

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

The following exceptions and additions to the GPG or the NSF Grants.gov Application Guide apply to full proposals submitted to this Program:

Full proposals will be accepted only from PIs who have submitted Preliminary proposals in the current review cycle.

Eligible proposals must originate from principal investigators whose projects are successful in the preceding preliminary proposal competition described above and must be based on those preliminary proposals. All proposals not meeting these requirements will be returned without review. Submission of full proposals by PIs whose preliminary proposals received a review recommendation of 'not invited' will be returned without review.

- Information About Principal Investigators/Project Directors and Co-Principal Investigators/Co-Project Directors – Use standard guidelines
- Cover Sheet:
 - Fastlane Users - Select this program solicitation number from the pull down list. Entries on the Fastlane cover sheet are limited to the principal investigator/project director and a maximum of 4 co-principal investigators/project directors. All other senior project participants should be listed on the project summary page and entered into Fastlane as Senior Personnel (this latter provision allows their biographical sketches to be included in the Fastlane proposal).
 - Grants.gov Users - The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. NSF allows one principal investigator/project director and a maximum of 4 co-principal investigators/project directors to be identified on a proposal. Instructions for entering additional senior project participants are included in Section V.5. of the NSF Grants.gov Application Guide.
- Title - The title of the proposal must begin with "PSCIC Full Proposal:".
- Project Summary (1 page) - The summary must consist of 3 parts: (1) At the top of this page, indicate the title of the project, the name of the PI and the lead organization; and a list of Co-PIs, Senior Personnel, and Collaborators along with their organizations; (2) Provide a succinct summary of the intellectual merit including the vision and rationale for the collaborative and the cyberinfrastructure capabilities, range of expertise, and mechanisms for promoting intellectual synthesis that will be used in achieving that vision; and (3) describe the broader impacts of the proposed work, including approaches to achieve goals for innovation and leadership in outreach and education.
- Project Description – The project description is limited to 15 pages and must address the following:
 - Results from Prior Research - Describe only prior research of the PI or Co-PIs funded by NSF that is directly relevant to this collaborative proposal.
 - Vision and Rationale for the Collaborative - Describe the over-arching vision for the Collaborative and how it will enable progress that could not be achieved by individuals and/or groups acting on their own.
 - Structure of the Collaborative - Describe the structure of the proposed collaborative and how its components will work together in achieving its vision.
 - Responsibilities of the Collaborative - Describe how the plans for the Collaborative will enable it to meet the full range of its responsibilities, including those enumerated in Section II above and outlined as follows: (a) Catalyze progress, (b) Advance plant science through creative synthesis, (c) Prepare the next generation, (d) Enable discovery through information access, and (e) Lead in outreach.
 - Characteristics of the Collaborative - Describe how the design, implementation, and operational plans for the collaborative will ensure that it has the characteristics necessary to fulfill its responsibilities, including those characteristics enumerated in Section II above and outlined as follows: (a) Interdisciplinary, (b) Innovative, (c) Community-driven, (d) Accountable, and (e) Diverse. (Note that the management plan should be detailed in an appendix as described below).
- References Cited – Indicate with an asterisk any cited publications resulting from prior research funded by NSF for the PI or Co-PIs when following the guidelines for all references cited.
- Biographical Sketches - Provide biographical sketches for the PI, Co-PIs, and other Senior Personnel listed on the Project Summary page.
- Current and Pending Support – Provide this information for the PI, Co-PIs and other senior personnel listed on the Project Summary page. Address any potential overlap between the federally funded projects that are listed and the proposed collaborative activities.
- Budget – Follow the instructions in the GPG or the NSF Grants.gov Application Guide for preparing the budget. Multi-institutional proposals must be submitted through the lead organization with a single budget including all other participating organizations as subawardees (see GPG guidelines, Chapter II.D.3). Provide a detailed budget

justification separately for the lead organization (up to 3 pages) and for each subawardee budget (up to 3 pages each). Funds for facility construction or renovation may NOT be requested.

- Special Information and Supplementary Documentation – The following additional information is required in addition to that allowed by the provisions of the GPG or the NSF Grants.gov Application Guide:
 - Appendix A1, Key Personnel: Provide a list of key leadership personnel (maximum 3 pages), with a brief description of what each person brings uniquely to the collaborative.
 - Appendix A2, Management Plan (maximum 3 pages): Provided a detailed management plan describing key leadership positions, reporting relationships, means of communication and interaction among the members of the group and with the community, oversight and accountability mechanisms, external advisory committees, etc. If an external advisory committee is to be utilized, do not list individual names, but list the number of members and describe the range of expertise needed to constitute an efficient and functional committee.
 - Appendix A3, Computational and cyberinfrastructure capabilities (maximum 4 pages): Describe the hardware and software systems and technologies, networking and access capabilities, help-desk services, and the service, fail-over, and archiving provisions for the collaborative. Discuss the computer and information science and engineering capabilities of collaborative personnel. Describe mechanisms (such as hardware and software replacement/development cycles, etc.) that will be used to ensure that the computational and cyberinfrastructure capabilities of the collaborative remain at the leading edge of rapidly evolving technologies, concepts, and strategies in computer and information science.
 - Appendix A4, Data, access, protection, and preservation policies (maximum 4 pages): Provide a clear statement of management of intellectual property rights and how the Collaborative plans to share information, data, tools, and resources that result from the activities supported by the NSF award, and that result from activities at the Collaborative regardless of the source of support. Describe how tools and resources that may have broad applicability will be made accessible and usable by the broader community of biologists and by those in other disciplines. Provide a plan for the long-term (i.e., beyond the term of NSF support for this project under the planned award) preservation of selected data for which the collaborative has responsibility (i.e., data generated by the collaborative or accepted by the collaborative from other sources for purposes of preservation). Describe the process the collaborative will use in selecting which data is appropriate for long-term preservation.
 - Appendix A5, Institutional Capabilities (maximum 2 pages). Describe how the current capabilities and resources of the lead and participating institutions will facilitate the proposed synthesis activities. Include information on organizational leadership, technical expertise, general support, and maintenance as well as space, infrastructure, and technologies for synthesis, analysis, and communication.
- Single Copy Documents: The following additional information is required in addition to that included within the provisions of the GPG or the NSF Grants.gov Application Guide:
 - Integrated Conflicts of Interests List for Applicants: Provide a list, in a single alphabetized table or spreadsheet of the full names and institutional affiliations of all people with conflicts of interest for the PI, Co-PIs, and any named personnel whose salary is requested in the project budget. The table should specify the nature of the conflict including: (1) PhD thesis advisors or advisees; (2) collaborator or co-authors, including postdocs, for the past 48 months; and (3) any other individuals or institutions with which the PI or Co-PIs have financial ties.
 - In addition to the Conflict of Interest List, other correspondence to the program not intended to be sent to reviewers, such as a list of potential reviewers, can be sent through the Single Copy Document section of FastLane and Grants.gov. Please note that key project personnel may be required, prior to an award decision, to submit copies of any intellectual property agreements or material transfer agreements they have signed, or are planning to sign, that would have an impact on the unrestricted and timely distribution of the outcomes of the NSF funded research. Submission of a Single Copy Document will allow these materials to be reviewed by the NSF officials only, and they will remain confidential.

Checklist for Proposal Preparation

- Proposal submitted as a single proposal with one organization as the lead and all other participating organizations as subawardees. No linked, collaborative proposal submissions will be accepted.
- Title begins with "PSCIC Preliminary Proposal: ..." or "PSCIC Full Proposal: ..."
- Project Summary contains all requested information, including the broader impacts of the proposed work
- Project Description is 7 (preliminary) or 15 (full) pages or less in length, including figures and tables
- References Cited includes publications resulting from prior research funded by NSF (marked*)
- Biographical Sketches (2 pages each) included for PI, Co-PIs, and Senior Personnel listed in the Project Summary
- Current and Pending Support Statements included for PI, Co-PIs and Senior Personnel listed in the Project Summary
- For full proposal, appendices A1, A2, A3, A4, and A5 uploaded in Supplementary Documents
- Single, alphabetized table listing conflicts of interests uploaded into Single Copy Documents Proposers are reminded to identify the program announcement/solicitation number (To be assigned) 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 to the National Science Foundation.

Other Budgetary Limitations: Funds for facility construction or renovation may NOT be requested.

C. Due Dates

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

November 30, 2006

- **Full Proposal Target Date(s):**

April 16, 2007

By Invitation Only

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

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

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program and, if they meet NSF proposal preparation

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

A. NSF Merit Review Criteria

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

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

What is the intellectual merit of the proposed activity?

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

- Rationale and vision for the collaborative: Does the proposal describe a rationale and vision that justifies Collaborative support?
- Collaborative responsibilities: Will the plan described in the proposal enable the Collaborative to meet its full range of responsibilities to catalyze progress, advance plant science through creative synthesis, prepare the next generation, enable discovery through information access, and lead in outreach?
- Collaborative characteristics: Does the plan described in the proposal ensure that the Collaborative will be interdisciplinary, innovative, community-driven, and diverse?

- Management plan: Does the management plan provide for strong and capable leadership, clear lines of authority and responsibility, accountability, effective communication within the collaborative, responsiveness to the community, and the ability to adapt to new opportunities and technologies?
- Computational capability: Does the proposal describe plans for computational and cyberinfrastructure capabilities that will enable the collaborative to meet its full set of responsibilities and remain at the leading edge of computer and information science and technology?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by a three-stage review process.

First, all proposers must submit a preliminary proposal that provides the information described in Section V above. Following review of preliminary proposals, selected proposers will be invited to proceed to the next stage of review with submission of a full proposal. Those who did not submit preliminary proposals are ineligible to submit a full proposal in the current review cycle. Full proposals submitted without a corresponding preliminary proposal in the current review cycle will not be accepted. Eligible full proposals will be evaluated by both external mail-in and panel reviews. The outcomes of this evaluation will then be used to select proposals for the third stage of review consisting of a site visit by a panel of outside experts.

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

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic

Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

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

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpm.

Special Award Conditions:

The award resulting from this funding opportunity will require substantial NSF oversight and will be made in the form of a Cooperative Agreement. The Cooperative Agreement will contain two types of terms and conditions, the Programmatic Terms and Conditions (PTC) which relate to the actual science research and education projects, and the Financial and Administrative Terms and Conditions (FATC) which relate to management of funds that support the project. NSF has responsibility for providing general oversight and monitoring of the collaborative to help assure effective performance and administration. Prior to finalizing the Cooperative Agreement, a retreat of the Collaborative's key personnel to address strategic planning of the collaborative will be required.

C. Reporting Requirements

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

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

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

Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

The PI of this collaborative will submit annual or other special reports of progress and plans with the contents of the reports to be determined by the terms of the cooperative agreement. External review in the form of a site/reverse site visit will be conducted by NSF approximately 12 months after the start of the award, and as often as necessary thereafter. The results of such review(s), the contents of annual reports, and the response of the Center to the reports it receives from its advisory group(s) will be among the factors used to determine the continuation of support.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Christopher Greer, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, telephone: (703) 292-8470, email: pscic@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.
- Lauren Kitchen, Science Assistant, Directorate for Biological Sciences, Division of Biological Infrastructure,

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

- **For General Information** (NSF Information Center): (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

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

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

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