

# Frontiers in Integrative Biological Research (FIBR)

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## Program Solicitation

**NSF 06-579**

*Replaces Document(s):*

**NSF 05-597**



**National Science Foundation**

Directorate for Biological Sciences  
Emerging Frontiers

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

September 22, 2006

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

February 16, 2007

## **REVISION NOTES**

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

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

This revision includes 4 significant changes from the previous document ([NSF 05-597](#)):

1. sets new dates for receipt of preliminary and full proposals,
2. reduces the length of preliminary proposals by reducing the Project Description section from 7 pages to 6 and the listing of project personnel in the Supplementary Documents section from 3 pages to 1,
3. adds a requirement for an explicit description of anticipated outcomes within the Project Description section, and
4. deleted a guideline for the project budget, and instead emphasizes the importance of a well justified budget.

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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**Program Title:**

Frontiers in Integrative Biological Research (FIBR)

**Synopsis of Program:**

The Frontiers in Integrative Biological Research (FIBR) Program supports integrative research that addresses major questions in the biological sciences. FIBR encourages investigators to identify major understudied or unanswered questions in biology and to use innovative approaches to address them by integrating the scientific concepts and research tools from across disciplines including biology, math and the physical sciences, engineering, social sciences and the information sciences. Proposers are encouraged to focus on the biological significance of the question, to describe the integrative approaches, and to develop a research plan that is not limited by conceptual, disciplinary, or organizational boundaries. Particularly encouraged are the inclusion of young scientists trained in an interdisciplinary environment or in non-biological disciplines, and partnerships with underrepresented minority serving and primarily undergraduate institutions and community colleges.

**Cognizant Program Officer(s):**

- Parag Chitnis, telephone: (703) 292-8440, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
- Richard McCourt, telephone: (703) 292-8470, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
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**Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):**

- 47.074 --- Biological Sciences

### Award Information

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**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 10 approximately

**Anticipated Funding Amount:** \$6,400,000 (approximately), total for all new awards in FY07, pending availability of funds

### Eligibility Information

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**Organization Limit:**

Proposals may only be submitted by the following:

- Academic Institutions located in the US: US universities and colleges located in the US.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the US associated with educational or research activities.
- Consortia of only the eligible organizations listed above. When a consortium of eligible 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 may not receive subawards. If they are part of the proposed network,

their participation is expected to be supported by non-NSF sources.

**PI Limit:**

PIs, Co-PIs and Senior Personnel may be involved with only one full proposal in the same year.

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

None Specified

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

1

PIs, Co-PIs and Senior Personnel may be involved with only one full proposal in the same year.

**Proposal Preparation and Submission Instructions**

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**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 submitted via FastLane:
  - Grant Proposal Guide (GPG) Guidelines apply
- 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/>) To obtain copies of the Application Guide and Application Forms Package: click on the Apply tab on the Grants.gov website, 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.

**B. Budgetary Information**

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- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

**C. Due Dates**

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

September 22, 2006

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

February 16, 2007

## Proposal Review Information Criteria

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

## Award Administration Information

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**Award Conditions:** Standard NSF award conditions apply

**Reporting Requirements:** Standard NSF reporting requirements apply

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## I. INTRODUCTION

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During the last decade, major breakthroughs have occurred in many areas including genomics, information technology, high throughput instrumentation, imaging and wireless technologies, sensors, and Geographic Information System (GIS). These breakthroughs have enabled novel and integrative approaches to major challenges in biology. Thus, 21<sup>st</sup> Century Biology represents research that is multidimensional, multidisciplinary, integrative, education-oriented and global, encompassing conceptual and experimental approaches much different from those of the previous century. While existing Directorate for Biological Sciences programs support these new directions in biological research, FIBR is designed to enable more integrative or interdisciplinary projects than might be possible in any single program. Through FIBR, BIO intends to support researchers who capitalize on synergistic interactions and who employ diverse tools to achieve an integrative understanding of a clearly defined, major biological question. Proposals that fit within the scope of another existing program at NSF should be directed to that program (see Section IX below for additional information).

BIO does not provide support for bioscience research with disease related goals, including work on the etiology, diagnosis and treatment of physical and mental disease, abnormality, or malfunction in human beings or animals. Animal models of such conditions and the development and testing of drugs and other procedures for their treatment also are not eligible for support. The submission of duplicate or substantially similar proposals concurrently for review by more than one program without prior NSF approval may result in the return of the redundant proposals. Research proposals to BIO cannot be duplicates of proposals to any other Federal agency for simultaneous consideration. The only exceptions to this rule applicable to the FIBR program are proposals in which the PI and all Co-PIs are beginning investigators (individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants). For proposers who qualify under this exception, the box for "Beginning Investigator" must be checked on the proposal Cover Sheet.

## **II. PROGRAM DESCRIPTION**

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The FIBR program supports integrative research focused on a major question in biology addressed through the creative application of a broad range of scientific concepts, strategies and research tools from both within and outside the biological sciences. FIBR projects are integrative at several conceptual levels. This includes the nature of the research paradigm (which may encompass multiple levels of organization or complexity, time and space, or range of organisms or processes), the use of combined experimental and theoretical analyses, and the application of a broad range of interdisciplinary approaches (e.g. math, physics, chemistry, social and behavioral sciences, computation and information sciences, etc.) in a single, coherent effort.

FIBR particularly encourages inclusion of young scientists trained in an interdisciplinary environment or in non-biological disciplines as PIs, co-PIs, or postdoctoral research associates. The FIBR program also encourages partnerships with community colleges, baccalaureate, comprehensive, and underrepresented minority-serving institutions.

When preparing a FIBR proposal, proposers are encouraged to focus on the biological significance of the question, to describe the best integrative approaches, and to develop a plan that is not constrained by any perceived or real barriers and limitations, be they conceptual, disciplinary, organizational or budgetary. It is essential that there be an integrative conceptual model to link each element of the research plan to overall goals, and to serve as a framework for analysis of hypotheses being tested.

To emphasize the importance of focusing on a major question in biology, the FIBR program requires that the title for the proposed project be a clear and succinct statement of the question (see Section V, Proposal Preparation and Submission Instructions).

It is recognized that proposals that cross significant disciplinary, intellectual, or other boundaries may not fit readily within existing programs and an important goal of the FIBR program is to provide a home for such proposals. Proposals that fit within the scope of an existing program at NSF or elsewhere should be submitted directly to those programs. Examples of other programs at NSF that support large scale collaborative research can be found under Section IX below, Other Programs of Interest. Consult the NSF Web Site for a complete description of NSF programs (<http://www.nsf.gov/funding/>).

The FIBR program supports the development of novel strategies, concepts and tools only if these are essential elements within a broader plan to address a major and well-defined question in biology. However, projects whose primary or central focus is on new tools and strategies development are not appropriate for the FIBR program.

Large-scale projects employing broadly integrative approaches may involve international teams of investigators and NSF encourages international collaborations. FIBR program funds may be requested to support US investigators and students to work in international laboratories or foreign investigators and students to work in US laboratories. However, foreign counterparts should secure support for their efforts from their own national programs.

A two stage review process will be used for FIBR proposals. First, all proposers must submit a preliminary proposal that outlines the project as described below. Based upon review of preliminary proposals by a panel of outside experts, selected proposers will be encouraged to proceed to the second stage of review with submission of a full proposal. Those not encouraged remain eligible to submit full proposals although this is not recommended. Full proposals submitted without a corresponding preliminary proposal in the current review cycle will be returned without review.

## **III. AWARD INFORMATION**

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It is anticipated that a total of approximately \$6.4 million will be available to support approximately 10 new Full Proposals in FY2007, contingent upon the quality of proposals received and pending the availability of funds. Funding decisions for full research proposals are anticipated by the end of July 2007, with awards expected to start in September 2007. The award size will be determined based on the nature of activities and at a level that would be enabling, as well as the availability of funds. The award duration will be up to 5 years. Proposers are strongly encouraged to develop a carefully crafted budget in line with the scope and scale of the project. The role and budget for each investigator (PI, co-PI, collaborator) should also be commensurate with the activities proposed.

#### IV. ELIGIBILITY INFORMATION

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##### Organization Limit:

Proposals may only be submitted by the following:

- Academic Institutions located in the US: US universities and colleges located in the US.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the US associated with educational or research activities.
- Consortia of only the eligible organizations listed above. When a consortium of eligible 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 may not receive subawards. If they are part of the proposed network, their participation is expected to be supported by non-NSF sources.

##### PI Limit:

PIs, Co-PIs and Senior Personnel may be involved with only one full proposal in the same year.

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

None Specified

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

1

PIs, Co-PIs and Senior Personnel may be involved with only one full proposal in the same year.

#### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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##### A. Proposal Preparation Instructions

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

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](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](mailto:pubs@nsf.gov)

The following exceptions and additions to the GPG guidelines apply to preliminary proposals submitted to this Program:

**Submission of Preliminary Proposals is required for Full Proposals.** Proposals that are not compliant with the guidelines may be returned without review. It is the submitting organization's responsibility to ensure that the proposal is compliant with all applicable guidelines.

Preliminary proposals must contain the items listed below and strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet the formatting requirements for font size, characters per inch, margins, etc. as specified in the Grant Proposal Guide.

Based on evaluation by a panel of outside experts, the FIBR Working Group expects to encourage approximately 20 Principal Investigators (PIs) to submit full proposals.

By mid December the program will e-mail PIs whose preliminary proposals are encouraged for full proposal submission.

Preliminary proposals should provide a brief overview of the project and should include sufficient information to allow assessment of the main ideas and approaches. Preliminary proposals must include the following items:

- Cover Sheet: Select the program solicitation number from the pull down list. The FIBR program will automatically be selected. Check the box indicated for preliminary proposal. Entries on the Cover Sheet are limited to the principal investigator and a maximum of four co-principal investigators. Additional project leaders/senior personnel should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal). Beginning investigators (individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants) must check the box for "Beginning Investigator" on the proposal Cover Sheet. For more FastLane instructions see section V. D. below.
- Title of Proposed Project: The title for the proposed FIBR project must begin with "FIBR Preliminary Proposal:" and be in the form of a question. The title must state clearly and succinctly the major question in biology that is the focus for the project.
- Project Summary: May not be more than one page in length, must consist of three parts: (1) At the top of this page include the title of the project, the name of the PI and the lead institution and/or organization, and a list of Co-PIs and Senior Personnel along with their institutions and/or organizations; (2) provide a succinct summary of the intellectual merit of the proposed project. This should include a clear and concise statement of the major question in biology that will be addressed, formulated as a single sentence and presented in italics, and a summary of the approaches to be used to address the question; and (3) describe the broader impacts of the proposed work. Proposals that do not address in the project summary both intellectual merit and broader impacts will be returned without review.
- Project Description. The project description will include:
  1. A description of the vision and goals for the project including an explicit statement of the major question in biology to be addressed, the proposed creative approaches to attain the goals, expected outcomes, and how the proposed project will advance the frontiers of biology (Maximum 4 pages).
  2. Anticipated Outcomes (maximum 1 page). Describe the anticipated outcomes of the project including what is expected to be learned through the research, what important new knowledge is expected to be gained, what tools and resources the project is expected to develop, what impact these tools, resources and knowledge are expected to have on advancements across and beyond the biological sciences, and what new paradigms for synergistic interaction, cooperation, education, and outreach are anticipated.
  3. Education and Training Plan (maximum 1 page). Describe how the proposed research will be integrated with educational activities and how these activities promote diversity as an integral component of the proposed project. Indicate how students trained in this research will be better able to handle emerging research problems in biological areas.
- References Cited. Indicate with an asterisk any cited publications that resulted from prior research funded by NSF for the PI, or Co-PI (s).
- Biographical sketches (2 pages each). Biographical sketches must be listed for the PI, Co-PIs and other Senior Personnel listed on the Project Summary page.
- Current and Pending Support for the PI, Co-PIs, and Senior Personnel must be included.
- No budget is required; however please enter \$2 in the Requested Amount box on the FastLane Cover Sheet (this entry allows correct FastLane processing).

- In the Special Information and Supplementary Documentation section, include the following:
  1. List of key personnel involved (maximum 1 page), with a brief description of what each person uniquely brings to the project and how they are integrated to produce positive synergies; and
  2. A list, in a single alphabetized table, with the full names and institutional affiliations of all people with conflicts of interest for all senior personnel (PI and Co-PI's) and any named personnel whose salary is requested in the project budget. Conflicts to be identified are (1) PhD thesis advisors or advisees, (2) collaborators or co-authors, including postdocs, for the past 48 months, and (3) any other individuals or institutions with which the investigator has financial ties (please specify type).

**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](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](mailto: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](mailto:pubs@nsf.gov).

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

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

The following exceptions and additions to the GPG guidelines 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.** Submission of full proposals by PIs whose preliminary proposals received a review recommendation of 'not encouraged' is strongly discouraged.

- **Cover Sheet:** Select the program solicitation number from the pull down list. The FIBR program will automatically be selected. Entries on the Cover Sheet are limited to the principal investigator and a maximum of 4 co-principal investigators. Additional project leaders/senior personnel should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal. Beginning investigators (individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants) must check the box for "Beginning Investigator" on the proposal Cover Sheet. For more FastLane instructions see section V. D. below.
- **Title of Proposed Project:** The title for the proposed FIBR project must begin with "FIBR:" and must be in the form of a question. The title must state clearly and succinctly the major question in biology that is the focus for the project.
- **Project Summary: (May not be more than one page in length.)** Must consist of three parts: (1) At the top of this page, include the title of the project, the name of the PI and the lead institution and/or organization, and a list of Co-PIs and Senior Personnel along with their institutions and/or organizations; (2) provide a succinct summary of the intellectual merit of the proposed project. This should include a clear and concise statement of the major question in



biology that will be addressed, formulated as a single sentence and presented in italics, and a summary of the approaches to be used to address the question; and (3) describe the broader impacts of the proposed work. Proposals that do not address in the project summary both intellectual merit and broader impacts will be returned without review.

- Project Description (maximum 15 pages). The project description will include:
  1. Results from Prior Research: Describe prior research of PI or co-PIs funded by NSF that is directly relevant to the proposed project.
  2. Proposed Research: Describe the vision and goals of the proposed research, the major question in biology to be addressed, approaches to attain the goals, expected outcomes, and how the proposed project will advance the frontiers of biology. Articulate unifying and integrative aspects of the proposed research as well as the innovative ideas of the research. Describe the anticipated outcomes of the project, such as: how the project will advance the biological sciences; what is expected to be learned through the research; what important new knowledge is expected to be gained; what tools and resources the project is expected to develop; what impact these tools, resources, and knowledge are expected to have on advancements across and beyond the biological sciences; and what new paradigms for synergistic interaction, cooperation, education, and outreach are anticipated.
  3. Education and Training Plan: Describe how the proposed research will be integrated with educational activities and how these activities promote diversity as an integral component. Indicate how students trained in this research will be better able to handle emerging research problems in biological sciences. These plans should take advantage of unique aspects of the proposed research and the research environment, with particular emphasis on increasing participation of underrepresented groups or students and faculty from under-served institutions or both.
- References Cited. Indicate with an asterisk any cited publications that resulted from prior research funded by NSF for the PI, or Co-PI(s).
- Biographical sketches for key personnel (PI, Co-PIs, and each of the senior personnel listed on the Project Summary page). Use the format described in GPG.
- Current and Pending support information must be provided for the PI and each of the Co-PIs and Senior Personnel listed in the Project Summary page.
- Budget. Follow instructions in GPG. Develop a realistic project budget that is consistent with the proposed activities. Provide detailed budget justifications separately for the lead institution's budget (up to 3 pages of budget justification), and for each subawardee budget (up to 3 pages of budget justification for each subaward). The PI and one other member of the project team will be asked to attend a meeting of FIBR awardees to be held at the National Science Foundation every two years, in even-numbered fiscal years. Include the necessary travel costs for attendance at the meeting in the proposed budget.
- Facilities, Equipment: Provide a description of available facilities and priorities for its use. For FIBR projects requiring additional equipment, justify the need for these resources in the context of the innovative work proposed.
- In the Special Information and Supplementary Documentation section, include the following:
  1. List of key personnel involved (maximum 3 pages), with description of what each person uniquely brings to the project and how they are integrated to produce positive synergies;
  2. Provide a detailed management plan (maximum 3 pages) including means of communication and data tracking/management within the group, management of intellectual property resulting from the project, and timeline of activities;
  3. Proposals that would generate significant digital data for preservation must include a data management plan (maximum 1 page). The contents of the data management plan should include: (1) the types of data to be produced, (2) the standards that would be applied for data format and metadata content, and (3) access policies and provision.

4. Means of sharing the outcome of the research with the rest of the scientific community, eg. publications, web sites, data bases, genome, EST, cDNA or other sequences, microarray data, etc. (maximum 2 pages). The description should be specific and describe what, how, and when the community would have access to the outcome of the project. This is particularly important for the projects that will produce tangible research tools and resources;
5. A list, in a single alphabetized table, with the full names and institutional affiliations of all people with conflicts of interest for all senior personnel (PI and Co-PI's) and any named personnel whose salary is requested in the project budget. Conflicts to be identified are (1) PhD thesis advisors or advisees, (2) collaborators or co-authors, including postdocs, for the past 48 months, and (3) any other individuals or institutions with which the investigator has financial ties (please specify type).

## B. Budgetary Information

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

## C. Due Dates

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

September 22, 2006

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

February 16, 2007

## D. FastLane/Grants.gov Requirements

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- **For Proposals Submitted Via FastLane:**

Detailed technical 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](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this 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/>.

- **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](mailto: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**

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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**

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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:**

Additional merit review considerations include overall impact of the research on biology, integrative nature of the

research plan, novelty of the proposed approaches, strength of the management plan, and effectiveness in broadening participation.

## **B. Review and Selection Process**

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Proposals submitted in response to this program solicitation will be reviewed by Adhoc Review or Panel Review.

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

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

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### **A. Notification of the Award**

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

### **B. Award Conditions**

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

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm).

Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

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

## C. Reporting Requirements

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

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

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

## VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- Parag Chitnis, telephone: (703) 292-8440, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
- Richard McCourt, telephone: (703) 292-8470, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
- Judith Plessset, telephone: (703) 292-8420, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)
- Patrick Herendeen, telephone: (703) 292-8480, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).
- Erin (Liz) Lawrence, telephone: (703) 292-8997, email: [biofibr@nsf.gov](mailto:biofibr@nsf.gov)

For questions relating to Grants.gov contact:

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

## IX. OTHER INFORMATION

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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>.

## OTHER PROGRAMS OF INTEREST

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Examples of other programs at NSF that support large scale, collaborative research include the following:

- Assembling the Tree of Life: [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5129&org=EF](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5129&org=EF)
- Biocomplexity in the Environment (BE): [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5532&org=EF](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5532&org=EF)
- Plant Genome Research Program: [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5338&org=DBI&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5338&org=DBI&from=home)
- 2010 Project:  
[http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5337&org=DBI](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5337&org=DBI)
- Nanoscale Science and Engineering (NSE): [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=7169&org=EF](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=7169&org=EF)
- Collaborative Research in Chemistry (CRC): [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5115&org=CHE&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5115&org=CHE&from=home)
- Focused Research Groups (in Math) FRG: [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5298&org=DMS](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5298&org=DMS)
- Science and Technology Centers (STC):  
<http://www.nsf.gov/od/oia/programs/stc/>
- Integrative Graduate Education and Research Traineeship Program (IGERT): [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12759&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12759&from=fund)
- Consult the NSF Web Site (<http://www.nsf.gov/funding/>) for information about these and other activities.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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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](mailto: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



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA  
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