Major Research Instrumentation Program (MRI)

Program Solicitation
NSF 07-510

Replaces Document(s):
NSF 05-515

National Science Foundation

Office of the Director
Office of Integrative Activities

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social Behavioral & Economic Sciences

Office of Polar Programs

Office of Cyberinfrastructure

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

January 25, 2007

Fourth Thursday in January, annually thereafter

REVISION NOTES

In furtherance of the President's Management Agenda, 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.

There have been a number of clarifications and updates, including the following:

- Clarified language regarding limitations on curricular use of instrumentation.
- Clarified type of institution for institutions with *exactly* 20 Ph.D.'s in past two years.
- Added language re: an institution exceeding its three proposal limit due to participation as a subawardee in another institution's proposal. New requirements stipulate that if a proposal includes a subaward, the PI must include a letter from the sponsored research office at the subawardee institution noting that this counts towards the subawardee's three-proposal limit. Also, new language states that if the institution exceeds its limit due to the subaward, the proposal with the subaward will be returned without review.
- Clarified circumstances under which smaller requests (<$100K) are allowed.
- Proposal titles must start with MRI.
- New language *requires* Results from Prior Support for shared instrumentation grants and provides guidance on information that should be provided in this section.
- Section on proposal preparation of the management plan has been reformatted for clarification purposes.
- Proposal preparation section on Supplementary Documents has been expanded. Now there are 3 sections: required, encouraged and not allowed. Letters of collaboration or institutional commitment for operation and maintenance are allowed, but length is limited. Letters of support and RUI impact and eligibility statements are explicitly forbidden. The Facilities, Equipment and Other Resources form is now explicitly encouraged.
- Language regarding budgetary limitations is clarified.
- Office of Cyberinfrastructure has been added to the list of participating NSF organizations.
- Information on contact person, deadline date and the section on Related NSF Programs for Research Instrumentation has been updated.
- Eligible Fields of Science and Engineering section has been modified to be consistent with the Grant Proposal Guide.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Major Research Instrumentation Program (MRI)
Instrument Development and Acquisition

Synopsis of Program:

The Major Research Instrumentation Program (MRI) is designed to increase access to scientific and engineering equipment for research and research training in our Nation's organizations of higher education, research museums and non-profit research organizations. This program seeks to improve the quality and expand the scope of research and research training in science and engineering, and to foster the integration of research and education by providing instrumentation for research-intensive learning environments. The MRI program encourages the development and acquisition of research instrumentation for shared inter- and/or intra-organizational use and in concert with private sector partners.

The MRI program assists in the acquisition or development of major research instrumentation by organizations that is, in general, too costly for support through other NSF programs. Proposals may be for a single instrument, a large system of instruments, or multiple instruments that share a common or specific research focus.

Cognizant Program Officer(s):

- Joan M. Frye, Staff Associate, 1285 N, telephone: (703) 292-8040, fax: (703) 292-9040, email: jfrye@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences

- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social, Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.078 --- Office of Polar Programs
- 47.079 --- Office of International Science and Engineering
- 47.080 --- Office of Cyberinfrastructure

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 220

Anticipated Funding Amount: $90,000,000 (Proposals submitted in response to this program solicitation will be competing for about $90 million, pending availability of funds, in Fiscal Year 2007)

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

1. US colleges, universities and organizations of higher education located in the US, its territories and possessions.
2. US independent research museums located in the US, its territories and possessions.
3. Consortia whose members consist only of organizations described in items (1) and (2)
4. US independent nonprofit research organizations located in the US, its territories and possessions.
5. US small businesses located in the US, its territories and possessions are eligible for instrument development support as private sector partners with submitting organizations; they may not submit proposals as a lead organization.

Note: For instrumentation to be used at a Federally Funded Research and Development Center (FFRDC), the proposal must be submitted as a consortium proposal, i.e., staff from two or more organizations, as defined in (1) and (2) above, must be active participants in the use or development of the instrument and listed on the cover page.

Organizations that are eligible to submit proposals to NSF's MRI Program are divided into three categories: Ph.D. granting organizations, non-Ph.D. granting organizations, and non-degree granting organizations.

- Ph.D. granting organizations are academic organizations that have produced more than 20 Ph.D.s or D. Sci's in all NSF-supported fields of science, mathematics or engineering during the previous two academic years (please review NSF's Guide to Programs for NSF supported fields of science, mathematics and engineering: http://www.nsf.gov/od/ lpa/news/publicat/nsf04009/start.htm).
- Non-Ph.D. granting organizations are two- and four- year colleges and universities that have produced 20 or fewer Ph.D.s or D.Sci.'s in all NSF-supported fields of science, mathematics, and engineering during the previous two academic years.
- Non-degree granting organizations are independent nonprofit research organizations, research museums and consortia of eligible organizations.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

Three (3) as described below.

Both of the following conditions must be met or proposal(s) will be returned without review:

1. An organization may submit or be included as a partner or subawardee in no more than three proposals.
2. If an organization submits or is included as a partner or subawardee in three proposals, at least one of the three proposals must be for instrument development.

NSF reserves the right to carefully examine development proposals to ensure that an institution does not exceed its proposal limit. If NSF determines that a development proposal is an acquisition proposal, and such determination results in an institution exceeding its limit, then said proposal will be returned without review. In addition, if the development proposal is found to be a standard research proposal that would be supported via normal NSF programs, the proposal will be returned without review.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **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

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

  January 25, 2007

  Fourth Thursday in January, annually thereafter

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: Standard NSF award conditions apply

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

I. INTRODUCTION

The Major Research Instrumentation (MRI) Program is designed to increase access to scientific and engineering equipment for research and research training in our Nation's organizations of higher education, research museums and nonprofit research organizations. This program seeks to improve the quality and expand the scope of research and research training in science and engineering, and to foster the integration of research and education by providing instrumentation for research-intensive learning environments. The MRI program encourages the development and acquisition of research instrumentation for shared inter- and/or intra-organizational use and in concert with private sector partners.

II. PROGRAM DESCRIPTION

MRI Program Goals

The goals of the MRI program are to:

- Support the acquisition, through purchase, upgrade, or development, of major state-of-the-art instrumentation for research, research training, and integrated research/education activities at organizations;

- Improve access to and increase use of modern research and research training instrumentation by scientists, engineers, and graduate and undergraduate students;

- Enable academic departments or cross-departmental units to create well-equipped learning environments that integrate research with education;

- Foster the development of the next generation of instrumentation for research and research training;

- Promote partnerships between academic researchers and private sector instrument developers.

MRI Program Scope

The MRI program assists in the acquisition or development of major research instrumentation by organizations that is, in general, too costly for support through other NSF programs.

Instrument Acquisition

Proposals may be for a single instrument, a large system of instruments, or multiple instruments that share a common or specific research focus. Proposal requests for computer and networked systems, clusters of advanced workstations, and other information infrastructure components necessary for research are encouraged.

The MRI program will NOT support proposal requests for

- computer networks as general-purpose equipment;
- assorted instruments or general lab equipment that do not share a common or specific research or research training focus;
- instrumentation requested primarily for standard science and engineering courses;
- renovation or modernization of research facilities, fixed equipment, or facilities such as research vessels, airplanes, large telescopes, and supercomputing centers. The term "research facilities" refers to the bricks-and-mortar physical plant in which sponsored or unsponsored research activities (including research training) take place, including related infrastructure, systems (e.g., HVAC and power systems, toxic waste removal systems), and fixed equipment. The term "fixed equipment" refers to the permanent components of a research facility that are integral (i.e., built in, rather than affixed) to the facility (e.g., clean rooms, fume hoods, elevators, laboratory casework); their removal would affect the integrity or basic operation of the facility.

Proposals that fall into these categories will be returned without review.

Please note that in accordance with guidelines described in the NSF Grant Proposal Guide, the submission of duplicate proposals is forbidden; the MRI program will return without review duplicate proposals submitted to other NSF instrumentation programs.

Instrument Development

NSF encourages the development of the next generation of research instrumentation. Accordingly, individual investigators and teams of researchers are encouraged to apply for instrument development support.

The academic research enterprise relies on and produces new generations of sophisticated research instrumentation and software simulations thereof. The right design, development, and manufacturing processes can yield new instruments that are more widely used, open up new areas of research and research training, and have potential as commercial products. This solicitation seeks to expand the research community's capabilities by supporting the development of new instruments or upgrades with enhanced performance. "Performance" includes accuracy; reliability; resolving power; throughput speed; sample capacity; flexibility of operation; breadth of application; user-friendliness; and cost of acquisition, operation, and maintenance.

NSF particularly encourages collaborations between disciplinary scientists and engineers who are knowledgeable in unique instrumentation areas and private sector experts in the area of instrument manufacture. Working together within a framework of concurrent engineering, such partnerships have the potential to create new products with wide scientific and commercial impact.

NSF does not consider the acquisition of individual pieces of equipment to be combined in a new system or the simple purchase of an upgrade to be instrument development.

Eligible Fields of Science and Engineering

Research with disease-related goals, including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals, is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support. However, research in bioengineering, with diagnosis- or treatment-related goals, that applies engineering principles to problems in biology and medicine while advancing engineering knowledge is eligible for support. Bioengineering research to aid persons with disabilities also is eligible.

Proposals will be considered for instrumentation used for NSF-supported fields of science, mathematics, and/or engineering. Researchers using this instrumentation need not be supported by NSF or the Federal government. The program will not provide support for the acquisition of instrumentation to be used in medical research and medical education (such as medical school courses) or in the conduct of disease-oriented research, including the etiology, diagnosis or treatment of physical or mental disease, abnormality or malfunction in human beings or animals, or the design and testing of drugs for treatment of such conditions. MRI will support the development of bioengineering instrumentation that advances bioengineering research and may also have clinical uses.

III. AWARD INFORMATION

Proposals submitted in response to this program solicitation will be competing for about $90 million, pending availability of funds, in Fiscal Year 2007.

Awards for instrumentation will range from $100,000 to $2 million. Proposals requesting less than $100,000 will be considered only from non-Ph.D. granting organizations or from the disciplines of mathematical science or social, behavioral, and economic science at any eligible organization.

Proposers may request an award period up to three years for acquisition proposals and up to five years for development proposals.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

1. US colleges, universities and organizations of higher education located in the US, its territories and possessions.
2. US independent research museums located in the US, its territories and possessions.
3. Consortia whose members consist only of organizations described in items (1) and (2)
4. US independent nonprofit research organizations located in the US, its territories and possessions.
5. US small businesses located in the US, its territories and possessions are eligible for instrument development support as private sector partners with submitting organizations; they may not submit proposals as a lead organization.

Note: For instrumentation to be used at a Federally Funded Research and Development Center (FFRDC), the proposal must be submitted as a consortium proposal, i.e., staff from two or more organizations, as defined in (1) and (2) above, must be active participants in the use or development of the instrument and listed on the cover page.

Organizations that are eligible to submit proposals to NSF's MRI Program are divided into three categories: Ph.D. granting organizations, non-Ph.D. granting organizations, and non-degree granting organizations.

- Ph.D. granting organizations are academic organizations that have produced more than 20 Ph.D.s or D. Sci's in all NSF-supported fields of science, mathematics or engineering during the previous two academic years (please review NSF's Guide to Programs for NSF supported fields of science, mathematics and engineering: http://www.nsf.gov/od/ lpa/news/publicat/nsf04009/start.htm).
- Non-Ph.D. granting organizations are two- and four- year colleges and universities that have produced 20 or fewer Ph.D.s or D.Sci.'s in all NSF-supported fields of science, mathematics, and engineering during the previous two academic years.
- Non-degree granting organizations are independent nonprofit research organizations, research museums

and consortia of eligible organizations.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

Three (3) as described below.

Both of the following conditions must be met or proposal(s) will be returned without review:

1. An organization may submit or be included as a partner or subawardee in no more than three proposals.
2. If an organization submits or is included as a partner or subawardee in three proposals, at least one of the three proposals must be for instrument development.

NSF reserves the right to carefully examine development proposals to ensure that an institution does not exceed its proposal limit. If NSF determines that a development proposal is an acquisition proposal, and such determination results in an institution exceeding its limit, then said proposal will be returned without review. In addition, if the development proposal is found to be a standard research proposal that would be supported via normal NSF programs, the proposal will be returned without review.

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

None Specified.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation 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.

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.

In addition to the GPG or NSF Grants.gov Application Guide, MRI proposals must be prepared in accordance with the following instructions: (Note: Where these instructions and those in the GPG or NSF Grants.gov Application Guide do not agree, these instructions take precedence.)

1. Cover Sheet.
   - FastLane Users: Select this program solicitation number from the pull down list. Where asked to identify the NSF Unit Consideration, select the appropriate Division within an NSF Directorate or the appropriate Office to consider your proposal. "Major Research Instrumentation" will be automatically selected as the program for your proposal.
   - Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. Where asked to identify the NSF Unit Consideration, select the appropriate Division within an NSF Directorate or the appropriate Office to consider your proposal. Select "Major Research Instrumentation" as the program for your proposal.

   The project title should convey the primary purpose of the proposal, e.g., "MRI: Acquisition of ____" or "MRI: Development of ____," and should specify if the proposal is being submitted by a consortium.

   Approval by the Authorized Organizational Representative (AOR) on the Cover Sheet of a proposal signifies that the proposer and all partner organizations understand and agree to the following statement: "The AOR of each organization involved in this proposal is aware of this submission."

2. Project Summary (Maximum length, 1 page). Describe the proposed major research instrumentation, the type of research/ research training conducted, and the activities that would result if NSF funds the project.

   NOTE: NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary.

3. Project Description (Maximum length, 15 pages, including all figures and charts). The project description must include items (a)-(d).

   a. *Research Activities* (Suggested length, 9 pages for instrument acquisition; 4 pages for instrument development). Describe the research and research training activities and projects to be conducted with the desired instrumentation, and sources of support, if any. In narrative or tabular form, list by number and type (e.g., senior personnel, postdoctoral fellows, graduate students, undergraduate students) the personnel who will use the instrumentation for research and research training on a regular basis. This section **must** include Results from Prior NSF Support, if any of the PIs have received NSF support for shared research instrumentation within the past five years. This section should include information on operation and maintenance, downtime and usage history.

   b. *Description of the Research Instrumentation and Needs* (Suggested length, 2 pages for instrument acquisition; 6 pages for instrument development). Provide a technical description of the requested instrumentation, including manufacturer and model number where appropriate. Proposers are strongly encouraged to submit manufacturers' quotes for instrument acquisition proposals. Written quotes from manufacturers should be scanned into the Supplementary Documents section of your FastLane proposal. For Grants.gov users, supplementary documents should be attached in Field 11 of the R&R Other Project Information Form. The description should be comprehensive enough to allow reviewers to evaluate the extent to which the equipment is essential and appropriate. A listing and/or description of related instrumentation currently available at or near the submitting organization should be provided, and the request should be justified in this context. For development of new instrumentation, present the design concept, rationale, and development methods in sufficient detail to allow evaluation of its technical feasibility. Provide preliminary results from existing equipment, or appropriate calculations or models to show the performance (e.g., sensitivity, capacity, stability, resolution or signal-to-noise ratio) to be achieved by the new instrument. Justify the necessity and adequacy of the new instrumentation for the proposed research projects, with reference to existing instruments.

   c. *Impact of Infrastructure Projects* (Suggested length, 2 pages). Describe how the instrumentation will contribute to meeting the research and educational goals of the organization or consortium. Indicate how the instrumentation will attract researchers and students, particularly underrepresented groups and

women pursuing advanced degrees in science and engineering, and improve the quality of their research training. (For example, the proposal could demonstrate that faculty at women's colleges and minority-serving organizations will have access to the instrumentation.) For instrument development proposals, discuss the potential impact of this activity on the Nation's academic research infrastructure. Describe how students will be involved and how their education will be enhanced through development efforts. If the development effort involves a private sector partner, submit a letter of agreement describing their role. This letter should be scanned into the Supplementary Documents section of your FastLane proposal. For Grants.gov users, supplementary documents should be attached in Field 11 of the R&R Other Project Information Form.

d. *Management Plan* (Suggested length, 2 pages for instrument acquisition; 3 pages for instrument development)

For instrument acquisition this plan should detail maintenance and operation projections.

- Specify how and by whom the requested instrumentation will be operated over the period of three years.
- Describe the technical expertise needed to maintain and operate the instrument with anticipated costs.
- Describe the facility in which the instrument will be housed.
- If the instrument will become part of a laboratory that houses similar equipment include information on usage and downtime.
- Describe procedures for allocating the new instrument time, if appropriate, and describe plans for attracting new users.
- Specify the organizational commitments regarding housing and costs associated with instrument maintenance and operations.

Sufficient detail should be given to allow for reviewers to evaluate whether the plan includes appropriate technical expertise and infrastructure to allow effective usage of the instrument as well as facilitate multi-user accessibility.

For instrument development this plan should detail the design and construction phases of the project.

- Include plans for making instrument design readily available to other researchers, e.g., for transferring the technology to other U.S. academic, industrial or government laboratories or for commercializing the instrument.
- Describe the schedule of the project activities, broken into tasks, and estimate cost of each activity.
- Describe the technical expertise needed to execute each activity.
- Include the description of parts and materials needed for the construction phase and the associated costs.
- Specify timelines and deliverables for each activity. List risks associated with each activity and methods for reanalyzing and modifying the project plan if necessary.
- Describe the organization of the project staff and methods of assessing performance. For each member of the team include a description of the responsibilities and explain why a given position is necessary for the completion of the design and construction of the new instrument.

Sufficient detail should be provided to allow reviewers to analyze the cost of the new technology.

Note: NSF will return without review proposals that do not include management plans as described above.

4. References Cited. Please refer to guidelines in the GPG or NSF Grants.gov Application Guide.

5. Biographical Sketches. Your proposal must include two-page biographical sketches of the PI, Co-PI(s), and senior personnel who are major users of the relevant research instrumentation. Also, provide a brief biosketch of the individual responsible for the instrumentation.

6. Budget and Funding. The budget justification, which must not exceed three pages, should itemize and explain all eligible project costs and explain the basis for all cost estimates.

7. Current and Pending Support. Provide a form for the PI, Co-PI(s), and each major user of the instrumentation for whom a biographical sketch is submitted. If an individual has no current or pending support (other than this proposal), completion of the form is not required.

8. Facilities, Equipment, and Other Resources. A listing and/or description of related instrumentation currently available at or near the performing organization should be provided.

9. Supplementary Documents.

   Required:

   - Provide a statement classifying the submitting organization as a non-Ph. D. granting organization, Ph. D. granting organization, or non-degree granting organization (as defined in Section IV). If the proposal involves organizations other than the submitting organization, list all partners and subawardees.
   - If an organization is a subawardee on a proposal, include a letter from the subawardee's sponsored research organization acknowledging that this proposal is included in their organization limit.
   - If the development effort involves a private sector partner, submit a letter (one page maximum) documenting the collaboration.

   Encouraged:

   - Include itemized vendor quotes for instrument acquisition proposals.
   - Include a letter (one page maximum) documenting institutional commitment for operation and maintenance.
   - Include letters (**one page maximum per outside organization**) documenting collaboration from users at organizations other than the submitting organization.

   Not Allowed:

   - Letters of support or endorsement, RUI Impact Statements and RUI Eligibility Statements are not allowed. Proposals containing any of these documents may be returned without review.

10. List of Suggested Reviewers (optional). Proposers may submit a list of suggested reviewers (including affiliation) whom they believe are especially well qualified to review the proposal to the "single-copy document" section of FastLane. If submitting via Grants.gov, complete the information and attach as a PDF file (see Field 6, Additional Single Copy Documents, on the NSF Grant Application Cover Page). Proposers may also list persons they would prefer not review the proposal, indicating why.

NOTE: Proposals containing items other than those required (or encouraged) above and by the GPG or NSF Grants.gov Application Guide may be returned without review.

B. Budgetary Information

Cost Sharing: Cost sharing is not required by NSF in proposals submitted to the National Science Foundation.

Other Budgetary Limitations:

For instrument acquisition proposals, eligible costs are limited to costs of instrument purchase, installation, commissioning, and calibration. The amount of the NSF request should be based on the net price of the instrumentation, including all academic discounts and other special purchase arrangements.

For instrument development proposals, eligible costs are limited to parts and materials needed for the construction of the instrument, commissioning costs, as well as the direct and indirect costs associated with support of personnel engaged strictly in the instrument development effort. Requests for personnel support must include a description of the responsibilities of the project co-workers and explain why a given position is necessary for the completion of the design and construction of the new instrument. Sufficient detail should be given to allow reviewers to analyze the cost of the new technology.

For either acquisition or development proposals the following costs are *not eligible*: (i) instrument maintenance and operation, (ii) direct and indirect costs associated with research projects to be conducted using the requested instrumentation (including researchers' salary and students' stipends) for use of the instrument after it is purchased or developed, (iii) publication costs, and

(iv) conference travel.

C. Due Dates

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

  January 25, 2007

  Fourth Thursday in January, annually thereafter

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:

In addition to the evaluation criteria stated above, the following will be considered:

- Plans for using the new or enhanced research capability in teaching, training or learning.
- **For instrument acquisition proposals**: Management Plan. Specifically, reviewers will evaluate whether the plan: 1) includes sufficient infrastructure and technical expertise to allow effective usage of the instrument; and 2) provides organizational commitments for operations and maintenance.
- **For instrument development proposals**: Management Plan. Specifically, reviewers will evaluate whether the plan has a realistic schedule and mechanisms to deal with potential risks. In addition, the reviewers will evaluate the availability of appropriate technical expertise to design and construct the instrument and the cost of the new technology.
- **For instrument development proposals**: Rationale for development of a new instrument. Specifically, reviewers will consider if the proposed instrument will enable new types of measurement or information gathering.

B. Review and Selection Process

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

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.

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 following topics should be addressed in all MRI annual and final project reports:

For Instrument Acquisition Proposals

- Status of order, delivery, and installation;
- Brief description of research projects that were enabled by the instrument;
- Number of students with hands-on experience, to include demographic information (indicate undergraduate or graduate, gender, ethnicity/race, disability, major);
- A list of the research groups granted access and the titles of the research and institutional affiliation, to include both on-campus and outside users;
- Data on usage and downtime;
- A short description of the management plan, noting deviations from the plan as described in the proposal;
- Description of setbacks and resulting change of plans; and
- Information on broader impacts activities to date.

For Instrument Development Proposals

- Status of development effort to date;
- Number of student participants, to include demographic information (indicate undergraduate or graduate, gender, ethnicity/race, disability, major);
- Information on broader impacts activities to date;
- New industrial partnerships;
- Technology transfer (e.g., design and/or instrument);
- A short description of the management plan, noting deviations from the plan as described in the proposal; and
- Description of setbacks and resulting change of plans; and
- Modifications in timeline.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Joan M. Frye, Staff Associate, 1285 N, telephone: (703) 292-8040, fax: (703) 292-9040, email: jfrye@nsf.gov

For questions related to the use of FastLane, contact:

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

Additional contact information for NSF's Major Research Instrumentation Program is as follows:

Office of Integrative Activities
Major Research Instrumentation Program
National Science Foundation, Room 1270
4201 Wilson Boulevard
Arlington, VA 22230
(703) 292-8040

E-Mail: mri@nsf.gov

Additional contact information for MRI proposals that will be reviewed in the **Office of Polar Programs**:

The Office of Polar Programs strongly encourages MRI proposals related to all aspects of polar research supported by the Foundation. For any proposals requiring access to the polar regions or polar logistical support, investigators must contact appropriate OPP program managers for guidance about submitting information needed to assess logistical support requirements. This should be done during proposal development. For proposals requiring access to the arctic, contact Simon Stephenson (703-292-7435 or sstephen@nsf.gov). For proposals requiring access to the Antarctic, contact one of the following managers: for projects related to Antarctic marine research, contact Alexander Sutherland (703-292-8032 or alsuther@nsf.gov); for all other Antarctic projects, contact Brian Stone (703-292-8032 or bstone@nsf.gov).

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, 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.

RELATED NSF PROGRAMS FOR RESEARCH INSTRUMENTATION

Program Title	Brochure	Telephone
Advanced Technologies and Instrumentation (ATI)	No publication number	703-292-4892
Chemistry Research Instrumentation and Facilities: Departmental Multi-User Instrumentation (CRIF:MU)	NSF 05-578	703-292-4953
Chemistry Research Instrumentation and Facilities: Instrumentation Development (CRIF:ID)	NSF 04-534	703-292-4953
Chemistry Research Instrumentation and Facilities: Cyberinfrastructure and Research Facilities (CRIF:CRF)	NSF 06-512	703-292-4962
CISE Computing Research Infrastructure	NSF 04-588	703-292-8950
Cyberinfrastructure for Environmental Observatories: Prototype Systems to Address Cross-Cutting Needs	NSF 06-505	703-292-8527
Earth Sciences: Instrumentation and Facilities (EAR/IF)	NSF 06-576	703-292-8558
Graduate Student and Optical Instrumentation Support Related to the Advanced Modular Incoherent Scatter Radar (AMISR)	NSF 05-564	703-292-9022
High Performance Computing System Acquisition: Towards a Petascale Computing Environment for Science and Engineering	NSF 05-625	703-292-8527
Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML)	NSF 05-550	703-292-9063
Information Technology Research (ITR)	NSF 04-012	703-292-8930

Instrument Development for Biological Research	NSF 06-570	703-292-8470
Instrumentation for Materials Research - Major Instrumentation Projects (IMR-MIP)	NSF 05-513	703-292-4920
Next Generation Cybertools	NSF 05-563	703-292-7025
Oceanographic Instrumentation	NSF 04-052	703-292-8583
Oceanographic Technology and Interdisciplinary Coordination Program (OTIC)	No publication number	703-292-8583
Program for Research and Education with Small Telescopes (PREST)	NSF 04-557	703-292-4909
Scientific Computing Research Environment for the Mathematical Sciences (SCREMS)	NSF 05-627	703-292-4859
Small Business Innovation Research and Small Business Technology Transfer Programs Phase I (SBIR/STTR)	NSF 06-598	703-292-7051

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