

# **INSTRUMENT DEVELOPMENT for BIOLOGICAL RESEARCH**

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## ***Program Announcement***

DIRECTORATE FOR BIOLOGICAL SCIENCES

**TARGET DATE:** *Last Monday of August, Annually*

NATIONAL SCIENCE FOUNDATION

**National Science Foundation**  
**Directorate for Biological Sciences**  
**Division of Biological Infrastructure**

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**DESCRIPTION OF PROGRAM**

The program for **INSTRUMENT DEVELOPMENT FOR BIOLOGICAL RESEARCH (IDBR)** provides support for:

- development of concept and proof of concept for an entirely novel instrument for biological research;
- development of new instruments that provide new capabilities for detection, quantification, or observation of biological phenomena, or significantly extend currently achievable sensitivity or resolution;
- novel or significantly improved instruments for study of biological systems at all levels of organization from the molecular and cellular to organisms, communities, and ecosystems;
- improved or novel software for the operation of instruments or the analysis of data or images; and
- workshops in emerging areas of instrumentation and instrument development relevant to biological research in areas supported by the Directorate for Biological Sciences.

There are no specific limits on the amount of funding that may be requested. Budget should be commensurate with the proposed instrument development research activity. It is not required that individual prototype instruments developed under these awards have multiple users, however, the advances in instrumentation that result from these awards must have future utility to a broad set of potential users in biological research.

The IDBR program will not consider proposals for the development or acquisition of specialized items of equipment required for projects that do not aim to develop novel or significantly improved instrumentation for general use. In such cases the applicant should contact the appropriate NSF research program officer.

**ELIGIBILITY**

Proposals are invited from U.S. academic institutions, non-profit research institutions, and consortia of such institutions with appropriate research and educational facilities, under guidelines described in *Grant Proposal Guide (GPG)*, NSF 98-2, Chapter I, Section D.

The Division of Biological Infrastructure supports instrumentation activities to aid research efforts covered by the Directorate for Biological Sciences (BIO), which supports research designed to understand the fundamental life processes at all levels of organization from molecules to ecosystems. Work done using instrumentation developed under this program must fall within the scope of the Directorate for Biological Sciences (see BIO Home Page at <http://www.nsf.gov/bio>).

Instrumentation used primarily 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 is not appropriate for consideration.

Except for beginning investigators (see *GPG*, Chapter I, Section A.3. for definition), the Directorate for Biological Sciences will not review research proposals that are simultaneously reviewed by another Federal agency, such as the National Institutes of Health or the Department of Energy. Generally, instrument development proposals are subject to this policy. In some circumstances, involving very large development projects, proposals may be jointly submitted to other Federal agencies, with prior written approval by all agencies involved. Contact the responsible program officer for information on joint submissions.

## PROPOSAL FORMAT AND CONTENT

Proposals submitted in response to this program announcement must be prepared and submitted via NSF FastLane in accordance with the guidelines provided in the NSF brochure *Grant Proposal Guide (GPG)*, NSF 98-2. The *GPG* is available on the NSF Web Site at the URL <http://www.nsf.gov>, or as printed booklet at no cost from the NSF Clearinghouse, phone (703) 292-7827, or by e-mail to [pubs@nsf.gov](mailto:pubs@nsf.gov). Each proposal must include the following elements:

### 1. Cover Sheet (NSF Form 1207):

Provide a cover sheet (NSF Form 1207) as described in the *GPG*. The title should be descriptive of the development activity to be pursued. This is filled out on FastLane by clicking on items from a pull down menu. In the box labeled "For consideration by NSF organizational unit," select "INSTRUMENTAT & INSTRUMENT DEVP."

### 2. Project Summary:

Provide a summary, as specified in the *GPG*, of the planned instrumentation development activity, the type of research for which the instrument will be used (either by the Principal Investigator or by future intended users), and the expected significance of the instrument for that research. The summary should be understandable to a scientifically literate reader.

### 3. Table of Contents (NSF Form 1359):

Provide a detailed table of contents (NSF Form 1359), as specified in the *GPG*.

### 4. Project Description:

Provide a description, as specified in the *GPG*, of the instrument development activity to be pursued. This section may not exceed 15 pages in length. The section should particularly cover the following four points.

**Results from Prior NSF Support:** Describe the results of the most relevant NSF-supported project related to the development project that is proposed, if any, as specified in the *GPG*.

**Development Plan and Research Program:**

Describe the development program to be undertaken and the research which the proposed instrument is intended, following the guidelines

in the *GPG*. Describe the design of the proposed instrument in detail sufficient to allow assessment of its feasibility.

**Scope of Potential Use:** Explain specifically why no existing commercial equipment will adequately fill the role of the proposed instrument. Explain the importance of the intended biological research to be enhanced by the proposed instrument development, and why the proposed instrument is essential for that research. Forecast, where possible, the range and number of users and research areas that would benefit from development of this instrument.

**Education and Human Resources:** Include a statement specifying the potential contribution of the proposed research to the education and development of human resources in science and engineering at the undergraduate, graduate, and postdoctoral levels. This statement may include, but is not limited to, the role of the research in student training, course preparation, and seminars. Special effectiveness or achievement in producing or enabling professional scientists and engineers from under-represented groups should be described.

### 5. References Cited:

Provide references as specified in the *GPG*.

### 6. Biographical Sketches:

Provide biographical sketches in the format specified in the *GPG*. Biographical sketches should not exceed two pages per investigator.

### 7. Budget (NSF Form 1030):

Provide a budget as specified in the *GPG* (NSF Form 1030). Among other items, the budget can request funds for personnel, shop costs, and indirect costs.

### 8. Current and pending support (NSF Form 1239):

Include a completed NSF Form 1239 as specified in the *GPG* for each key personnel.

### 9. Facilities, Equipment and Other Resources (NSF Form 1363):

Provide a facilities statement as described in the *GPG* (NSF Form 1363).

## 10. Special Information and Supplementary Documentation:

Reference the *GPG, Chapter II* for detailed information. Mail necessary items, such as, documentation of collaborative arrangements, environmental impact statements, and certifications involving research with vertebrate animals or endangered species. No letter of general endorsement should be included. See mailing instructions in the Proposal Submission section.

## PROPOSAL SUBMISSION

The **target date** for submitting proposals to the Instrumentation Development for Biological Research program is the **last Monday in August, annually**. Proposals received by the target date are considered by the Advisory Panel that meets in October or November following the August target date. Proposals that do not allow sufficient time for review by this Advisory Panel may be returned without review. Proposals for this solicitation require electronic submission via NSF FastLane.

To access FastLane, go to the NSF Web Site at the URL <http://www.nsf.gov>, then select "FastLane" or go directly to the FastLane Home page located at <http://www.fastlane.nsf.gov/>. For instructions to prepare and submit your proposal via FastLane, please see Instructions for Preparing and Submitting a Proposal to the NSF Directorate for Biology Sciences located at <http://www.fastlane.nsf.gov/a1/BioInstr.htm>. Additionally, read the "PI Tipsheet for Proposal Preparation," and the "Frequently Asked Questions About FastLane Proposal Preparation" accessible at the URL <https://www.fastlane.nsf.gov/a1/A1Prep.htm>.

Mail the following materials directly to the Instrument Development for Biological Research Program:

- a paper copy of the cover sheet signed by the PI and an institutional representative, including the certification page (page 2 of 2);
- the BIO classification form; and
- relevant information as outlined in the "Special Information and Supplementary Documentation" of the Proposal Format section.

These materials must be received within five (5) business days of submitting the proposal via NSF FastLane. Send the materials to:

Instrument Development for Biological Research  
NSF 98-119  
National Science Foundation  
4201 Wilson Boulevard  
Room 615  
Arlington, VA 22230

**Do not mail copies of the proposal.** NSF will make the appropriate number of copies of the proposal.

## PROPOSAL REVIEW

Proposals are reviewed both by an advisory panel and by expert mail review. Reviewers evaluate proposals on the merit review criteria described in the *Grant Proposal Guide (GPG)*, NSF 98-2, Chapter III: (1) What is intellectual merit of the proposed activity? and (2) What are the broader impacts of the proposed activity?

In addition, reviewers also consider: (3) adequacy of the investigators' current research grants to support their biological research and to utilize the instrument, or (if the developing group is different from the user group) the adequacy of the developer's capacity to transfer the technology to commercial development or to wider public research use; (4) the degree to which the instrument and ancillary components are appropriate and essential for the research projects; (5) the adequacy of the mechanical and electronics shops or of subcontractors offering equivalent services, as appropriate; and (6) appropriateness of the research to the mission of the NSF.

As part of the consideration of the merit of the research, the reviewers examine the importance of both the instrumentation research and the biological research for which the instrument is eventually intended. As a part of the consideration of the effect on infrastructure, the reviewers consider the number of investigators who expected to benefit significantly from the instrument, and the value of the instrument to the biological research community.

## INQUIRIES

Make general inquiries to:

Instrument Development for Biological Research  
Program  
Program Director, Room 615  
National Science Foundation

4201 Wilson Blvd.  
Arlington, VA 22230  
Telephone: (703) 306-1472  
E-mail: [dbiid@nsf.gov](mailto:dbiid@nsf.gov)

## **GRANT ADMINISTRATION**

Grants awarded as a result of this announcement are administered in accordance with the terms and conditions of NSF GC-1, "Grant General Conditions," or FDP-III, "Federal Demonstration Project General Terms and Conditions," depending on the grantee organization. Copies of these documents are available at no cost from the NSF Clearing-house, telephone (703) 292-7827, or via e-mail to [pubs@nsf.gov](mailto:pubs@nsf.gov). More comprehensive information is contained in the NSF Grant Policy Manual, available on the NSF On Line Document System located at <http://www.nsf.gov/>, or for sale through the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

## **AWARDS**

Funding is available, in most cases beginning January of the next year. Funding for the program is subject to change annually. In fiscal year 1997 the program supported 21 new awards, ranging from \$20,000 to \$360,000 annually.

## **FINAL PROJECT REPORT**

Upon completion of the project a Final Project Report (NSF Form 98A), including the Part IV Summary, is required. This report is due not more than 90 days after the expiration date of the grant (see the *GPG* NSF 98-2, Chapter VII, Section G.2). Review this form prior to proposal submission so that

appropriate tracking mechanisms are included in the proposal plan to ensure that complete information will be available at the conclusion of the project.

## **EDUCATIONAL/TRAINING SUPPLEMENTS**

After an Instrument Development grant has been awarded, it is eligible to receive supplements for educational purposes. Specific programs are available to support the participation of high school students, undergraduate students, and investigators at undergraduate institutions in research activity. Examples of such programs are the "Research Experiences for Undergraduates" (NSF 96-102), and "Research Opportunity Awards" (NSF 94-79). For additional information on these programs, please see the appropriate program announcement or contact the appropriate program officer.

## **OTHER PROGRAMS OF INTEREST**

NSF Guide to Programs (NSF 97-150) briefly describes Foundation activities. All NSF publications are available via the NSF OnLine Document System located at the URL <http://www.nsf.gov>.

## **GENERAL INFORMATION**

The National Science Foundation provides awards for research and education in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for the research findings or their interpretation.

The Foundation welcomes proposals from all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and education related programs described here. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

**Facilitation Awards for Scientists and Engineers with Disabilities (FASED)** provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD, dial (703) 292-5090 or (800) 281-8749, for FIRS, 1-800-877-8339.

## **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; 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 application review process; to applicant institutions/grantees to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Gail A. McHenry, Reports Clearance Officer; Information Dissemination Branch, DAS; National Science Foundation; Arlington, VA 22230.

The programs described in this publication are in the Category 47.074, Biological Sciences, in the Catalog of Federal Domestic Assistance.

## **ORDERING PUBLICATIONS**

Copies of NSF publications can be obtained from the NSF OnLine Document system (<http://www.nsf.gov/>). Copies of documents are also available at no cost from the NSF Clearinghouse, telephone (703) 292-7827, or via e-mail to [pubs@nsf.gov](mailto:pubs@nsf.gov). In your request, include the NSF publication number and title, number of copies, your name, and a complete mailing address. Publications mailed to U.S. addresses should be received within three weeks after placement of your order.

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**(Electronic Dissemination Only)**