

# NASA-NSF-EPRI Joint Investigation of Enabling Technologies for SSP (JIETSSP)

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## Program Announcement

**NSF-02-098**

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

**NATIONAL SCIENCE FOUNDATION**

**DIRECTORATE FOR ENGINEERING**

**DIVISION OF ELECTRICAL AND COMMUNICATIONS SYSTEMS**

**DIVISION OF BIOENGINEERING AND ENVIRONMENTAL SYSTEMS**

**DIVISION OF DESIGN, MANUFACTURE, AND INDUSTRIAL INNOVATION**

**DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCE AND ENGINEERING**

**DIVISION OF INFORMATION AND INTELLIGENT SYSTEMS**

**ELECTRIC POWER RESEARCH INSTITUTE**

**LETTER OF INTENT DUE DATE(S) (*required*): May 10, 2002**

**FULL PROPOSAL DEADLINE(S): June 15, 2002**



**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**



**NATIONAL SCIENCE FOUNDATION**



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- **For General Information (NSF Information Center):** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090 or (800) 281-8749
- **To Order Publications or Forms:**
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  - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

# SUMMARY OF PROGRAM REQUIREMENTS

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## GENERAL INFORMATION

**Program Title:** NASA-NSF-EPRI Joint Investigation of Enabling Technologies for SSP (JIETSSP)

**Synopsis of Program:** The National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF) and the Electric Power Research Institute (EPRI) announce a partnership to support research in critical enabling technologies which will determine whether Space Solar Power (SSP) can someday become a viable cost-competitive technology for supplying large-scale base-load electric power worldwide. The solicitation emphasizes (but is not restricted to) four special priority areas: wireless power transmission, computational intelligence for teleautonomous robotic assembly, environmental implications, and power management and distribution.

### Cognizant Program Officer(s):

- Paul Werbos, Control, Networks and Computational Intelligence, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [pwerbos@nsf.gov](mailto:pwerbos@nsf.gov)
- John Mankins, telephone: 202-358-4659, e-mail: [jmankins@hq.nasa.gov](mailto:jmankins@hq.nasa.gov).
- Pat George, NASA Glenn Research Center, telephone: 216-433-2353, e-mail: [patrick.george@grc.nasa.gov](mailto:patrick.george@grc.nasa.gov).
- Neville Marzwell, NASA Jet Propulsion Laboratory, Advanced Concepts/Technology Innovations, telephone: 818-354-6543, e-mail: [Neville.I.Marzwell@jpl.nasa.gov](mailto:Neville.I.Marzwell@jpl.nasa.gov).
- Joe Howell, NASA Marshall Space Flight Center, telephone: 256-961-7566, e-mail: [joe.howell@msfc.nasa.gov](mailto:joe.howell@msfc.nasa.gov).
- James Momoh, Control, Networks and Computational Intelligence, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [jmomoh@nsf.gov](mailto:jmomoh@nsf.gov).
- James Mink, Electronics, Photonics and Device Technology, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [jmink@nsf.gov](mailto:jmink@nsf.gov).
- Usha Varshney, Electronics, Photonics and Device Technology, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [uvarshne@nsf.gov](mailto:uvarshne@nsf.gov).
- Junku Yuh, Robotics and Human Augmentation, Program Director, CISE, IIS, telephone: 703-292-8704, e-mail: [jyuh@nsf.gov](mailto:jyuh@nsf.gov).

- William Bainbridge, Deputy Division Director, CISE, IIS, telephone: 703-292-7470, e-mail: [wbainbri@nsf.gov](mailto:wbainbri@nsf.gov).
- Bruce Hamilton, Division Director, ENG, BES, telephone: 703-292-7066, e-mail: [bhamilto@nsf.gov](mailto:bhamilto@nsf.gov).
- Ron Rardin, Operations Research and Production Systems, Program Director, ENG, DMII, telephone: 703-292-8380, e-mail: [rrardin@nsf.gov](mailto:rrardin@nsf.gov).
- Steven Gehl, Electric Power Research Institute, e-mail: [sgehl@epri.com](mailto:sgehl@epri.com).

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

- 47.070 --- Computer and Information Science and Engineering
- 47.041 --- Engineering

#### **ELIGIBILITY INFORMATION**

- **Organization Limit:** This solicitation is open to U.S. academic institutions, nonprofit organizations and small businesses eligible under the NSF Grant Proposal Guide (NSF 02-2). See Section III for details.
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

#### **AWARD INFORMATION**

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 6-12
- **Anticipated Funding Amount:** \$3,000,000 in FY2002 pending availability of funds.

#### **PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

##### *A. Proposal Preparation Instructions*

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full program announcement/solicitation for further information.
- **Preliminary Proposals:** Submission of Preliminary Proposals is optional. Please see the full program announcement/solicitation for further information.
- **Full Proposals:** Standard Preparation Guidelines
  - Standard GPG Guidelines apply.

### ***B. Budgetary Information***

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

### ***C. Deadline/Target Dates***

- **Letters of Intent (*required*):** May 10, 2002
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** June 15, 2002

### ***D. FastLane Requirements***

- **FastLane Submission:** Required
- **FastLane Contact(s):**
  - Melyni McGriff, Program Assistant, ENG, ECS, telephone: 703-292-8339, e-mail: [mmcgriff@nsf.gov](mailto:mmcgriff@nsf.gov).
  - Gwen Owens, Administrative Officer, ENG, ECS, telephone: 703-292-8339, e-mail: [gowens@nsf.gov](mailto:gowens@nsf.gov).

## **PROPOSAL REVIEW INFORMATION**

- **Merit Review Criteria:** National Science Board approved criteria apply.

## **AWARD ADMINISTRATION INFORMATION**

- **Award Conditions:** Additional award conditions apply. Please see the program announcement/solicitation for further information.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

## **I. INTRODUCTION**

In 2001, the Millennium Project of the United Nations system (<http://millennium-project.org>) asked policy makers and science policy makers all over the world: "What challenges can science pursue whose resolution would significantly improve the human condition?" The leading response was: "Commercial availability of a cheap, efficient, environmentally benign non-nuclear fission and non-fossil fuel means of generating base-load electricity, competitive in price with today's fossil fuels."

No such energy source now exists. Space Solar Power (SSP) shows credible potential to become such an energy source, uniquely suitable to meeting the needs of rapidly developing nations, if the projected costs could be reduced through the development of new breakthroughs in technology, and if the environmental implications were adequately understood. The challenges, opportunities, and risks have been summarized in two recent documents important to this initiative: the National Research Council (NRC) report of 2001 ([www.nap.edu/catalog/10202.html](http://www.nap.edu/catalog/10202.html)), and the report of the joint NSF-NASA workshop of April 2000 ([robotics.usc.edu/workshops/ssp2000/index.html](http://robotics.usc.edu/workshops/ssp2000/index.html)). Both reports agree that the costs and uncertainties of SSP, using today's technology, would be far too expensive to justify immediate deployment. However, both reports conclude that there is a significant potential for cost reduction, and a need for expanded research, guided by the basic principles of decision theory and risk management. In particular, where there are large uncertainties, possibilities for scientific breakthroughs, and possibilities for developing general-purpose technology in other areas as well, small investments in basic research are justified.

This solicitation should not be interpreted as an implicit claim that SSP will become viable in the future. Only the marketplace and the larger world can make such determinations, after the technical possibilities have become better understood. This partnership is one part of a larger portfolio of basic research which will attempt to open up other new options as well. (For example, see Electric Power Networks Efficiency and Security, EPNES, NSF 02-041.)

## **II. PROGRAM DESCRIPTION**

This solicitation seeks proposals for fundamental, high-risk research which has serious potential to have impact on the larger goals discussed in the Introduction. The NRC and NSF-NASA reports mention many possible areas for research. However, the bulk of the funds for this solicitation will go toward projects which would have an impact in one of the following four key areas:

1. Radical improvements in wireless power transmission (WPT). Primary emphasis will be on solid-state device issues central to solid-state transmission by microwave, but there is also some interest in intelligent control and systems issues relevant to managing or improving WPT systems, in systems which would use the natural vacuum of space in place of vacuum tubes, and in transmission by solid-state lasers.

2. More intelligent robotics, to allow assembly of SSP structures in space with minimal use of humans in space. The idea here is to use SSP assembly as a test bed challenge for the use of greater intelligence in robotics or, from a practical viewpoint, to achieve breakthroughs in robotic capabilities by exploiting/advancing more advanced cutting edge types of technology. One concept, called "teleautonomy," is to develop a coordination system in which 100 humans on earth supervise 1,000 robots, based on new software which addresses control, intelligence, and the coordination of both humans and robots towards the overall assembly task.
3. Improved power management and distribution and control (PMAD), with a special emphasis on reducing weight, as described in the NRC report. Interesting possibilities for breakthroughs may exist for high-voltage cabling, switches and distribution; high-voltage converters; high-temperature semiconductors for PMAD; intelligent power controls and health management; superconductors; radiated energy management; and revolutionary options for solar power generation beyond the scope of existing research funded by the Department of Energy.
4. Understanding of costs and opportunities, and how to optimize them, for the net impact on the environment, health and safety, i.e., to the biosphere, the ionosphere, and to sustainable growth around the world. Among the topics of interest are techniques for making beams safe, evaluation of impacts of microwaves on living and nonliving systems, effects on communication systems, land use issues, and issues relating to space debris and environmental issues which impact SSP components.

Researchers proposing work in other topics should bear in mind that the reviewers will be asked to evaluate the potential impact of new work relative to research already supported by existing programs in areas such as space transportation, solar cell fabrication, structural nanomaterials and the like. Benefits to fundamental scientific understanding and benefits to the long-range future of humanity will receive approximately equal emphasis in the peer review process.

### **III. ELIGIBILITY INFORMATION**

This solicitation is open to U.S. academic institutions, nonprofit organizations and small businesses eligible under the NSF Grant Proposal Guide (NSF 02-2). See the NSF Grants Policy Manual ([www.nsf.gov/nsf/nsfpubs/gpm95/](http://www.nsf.gov/nsf/nsfpubs/gpm95/)) for more details. Subcontracts to large companies and federally funded R&D centers (FFRDCs) are allowed, particularly for experimental testing. However, in the case of FFRDCs, the proposal must clearly establish that the requisite testing capabilities are not available from the private sector. Institutions which have not had an NSF award within the last two years should consult the Prospective New Awardee Guide NSF 02-044).

### **IV. AWARD INFORMATION**

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Typical awards are expected to be between \$240,000 and \$500,000 total over three years. The actual distribution by amount will depend strongly on the results of peer review, which will include an evaluation of the trade-off between impact and cost. Some proposals may be funded on a reduced one-year exploratory basis.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### A. Proposal Preparation Instructions

**Letters of Intent:** Proposers must submit a brief letter of intent, by May 10, giving an indication of the general topic and technical expertise required to evaluate the work. This will be important to the interagency working group in scheduling panels with the requisite expertise to do justice to the proposals. The letters of intent should be emails addressed simultaneously to:

- o [jmankins@hq.nasa.gov](mailto:jmankins@hq.nasa.gov)
- o [pwerbos@nsf.gov](mailto:pwerbos@nsf.gov)
- o [jyuh@nsf.gov](mailto:jyuh@nsf.gov)

### Preliminary Proposals:

#### Full Proposal:

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 Web Site at: <http://www.nsf.gov/cgi-bin/getpub?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 the program solicitation number (NSF-02-098) in the program announcement/solicitation block on the *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.

### B. Budgetary Information

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

***Other Budgetary Limitations:*** Budgets should include provision for attendance at coordinated review meetings as specified in section VII.B.

### C. Deadline/Target Dates

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

**Letters of Intent (*required*):** May 10, 2002

**Full Proposals by 5:00 PM local time:** June 15, 2002

### D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://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 announcement/solicitation.

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

## **VI. PROPOSAL REVIEW INFORMATION**

### **A. NSF Proposal Review Process**

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

The two 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 he/she 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.

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 identities of reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

**B. Review Protocol and Associated Customer Service Standard**

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

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 closing date of an announcement/solicitation or the date of proposal receipt (whichever is later). The interval ends when the Division Director accepts the Program Officer's recommendation.

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

## **VII. AWARD ADMINISTRATION INFORMATION**

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

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

### **B. Award Conditions**

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)\* or Federal Demonstration Partnership (FDP) Terms and Conditions;\* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards 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 Web site 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 Web site 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 Web site at <http://www.gpo.gov>.

### **Special Award Conditions**

The P.I. must participate in up to two mandatory coordinated review meetings each year, to be arranged by the interagency working group which manages this solicitation. The working group will consist of the cognizant program officers or their designees or successors.

### **C. Reporting Requirements**

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

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

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

## **VIII. CONTACTS FOR ADDITIONAL INFORMATION**

General inquiries regarding NASA-NSF-EPRI Joint Investigation of Enabling Technologies for SSP should be made to:

- John Mankins, telephone: 202-358-4659, e-mail: [jmankins@hq.nasa.gov](mailto:jmankins@hq.nasa.gov).
- Pat George, NASA Glenn Research Center, telephone: 216-433-2353, e-mail: [patrick.george@grc.nasa.gov](mailto:patrick.george@grc.nasa.gov).
- Neville Marzwell, NASA Jet Propulsion Laboratory, Advanced Concepts/Technology Innovations, telephone: 818-354-6543, e-mail: [Neville.I.Marzwell@jpl.nasa.gov](mailto:Neville.I.Marzwell@jpl.nasa.gov).
- Joe Howell, NASA Marshall Space Flight Center, telephone: 256-961-7566, e-mail: [joe.howell@msfc.nasa.gov](mailto:joe.howell@msfc.nasa.gov).
- Paul Werbos, Control, Networks and Computational Intelligence, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [pwerbos@nsf.gov](mailto:pwerbos@nsf.gov).
- James Momoh, Control, Networks and Computational Intelligence, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [jmomoh@nsf.gov](mailto:jmomoh@nsf.gov).
- James Mink, Electronics, Photonics and Device Technology, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [jmink@nsf.gov](mailto:jmink@nsf.gov).
- Usha Varshney, Electronics, Photonics and Device Technology, Program Director, ENG, ECS, telephone: 703-292-8339, e-mail: [uvarshne@nsf.gov](mailto:uvarshne@nsf.gov).
- Junku Yuh, Robotics and Human Augmentation, Program Director, CISE, IIS, telephone: 703-292-8704, e-mail: [jyuh@nsf.gov](mailto:jyuh@nsf.gov).
- William Bainbridge, Deputy Division Director, CISE, IIS, telephone: 703-292-7470, e-mail: [wbainbri@nsf.gov](mailto:wbainbri@nsf.gov).

- Bruce Hamilton, Division Director, ENG, BES, telephone: 703-292-7066, e-mail: [bhamilto@nsf.gov](mailto:bhamilto@nsf.gov).
- Ron Rardin, Operations Research and Production Systems, Program Director, ENG, DMII, telephone: 703-292-8380, e-mail: [rrardin@nsf.gov](mailto:rrardin@nsf.gov).
- Steven Gehl, Electric Power Research Institute, e-mail: [sgehl@epri.com](mailto:sgehl@epri.com).

For questions related to the use of FastLane, contact:

- Melyni McGriff, Program Assistant, ENG, ECS, telephone: 703-292-8339, e-mail: [mmcgriff@nsf.gov](mailto:mmcgriff@nsf.gov).
- Gwen Owens, Administrative Officer, ENG, ECS, telephone: 703-292-8339, e-mail: [gowens@nsf.gov](mailto:gowens@nsf.gov).

## **IX. OTHER PROGRAMS OF INTEREST**

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

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](#) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

## **ABOUT THE NATIONAL SCIENCE FOUNDATION**

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

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

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-supported projects. See the program announcement/solicitation for further information.

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 or (800) 281-8749, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at [plainlanguage@nsf.gov](mailto:plainlanguage@nsf.gov).

## 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 proposal review process; to applicant 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 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.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid 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 this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

*OMB control number: 3145-0058.*