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Cognitive Neuroscience

Program Announcement

NSF 02-031

DIVISION OF BEHAVIORAL AND COGNITIVE SCIENCES

FULL PROPOSAL TARGET DATE(S):

March 15, 2002

January 15 of each year (starting 2003)

July 15 of each year

NATIONAL SCIENCE FOUNDATION

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Cognitive Neuroscience

Synopsis of Program: The Cognitive Neuroscience emphasis seeks highly innovative and interdisciplinary proposals aimed at advancing a rigorous understanding of how the human brain supports thought, perception, affect, action, social processes, and other aspects of cognition and behavior, including how such processes develop and change in the brain and through evolutionary time.

Cognizant Program Officer(s):

- Lawrence M. Parsons, Cognitive Neuroscience, Program Director, Social, Behavioral, and Economic Sciences, Behavioral and Cognitive Sciences, 995 N, telephone: (703) 292-7249 (voice); (703) 292-9068 (fax), e-mail: lparsons@nsf.gov.

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

- 47.075 --- Social, Behavioral and Economic Sciences

ELIGIBILITY INFORMATION

- **Organization Limit:** None
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 30 Awards
- **Anticipated Funding Amount:** $7,000,000 annually, pending availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **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:** Indirect costs are not allowed on Dissertation Improvement proposals.
- **Other Budgetary Limitations:** Not Applicable.

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Target Date(s):**

  March 15, 2002
  January 15 of each year starting in 2003
  July 15 of each year

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
  - BCSFASTLANE@NSF.GOV.

PROPOSAL REVIEW INFORMATION

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

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

I. INTRODUCTION

The National Science Foundation announces a new emphasis in the area of Cognitive Neuroscience within the Division of the Behavioral and Cognitive Sciences in the Directorate for Social, Behavioral, and Economic Sciences.

Cognitive neuroscience has emerged in the last decade as an intensely active and influential discipline, forged from interactions among the cognitive sciences, neurology, neuroimaging (including physics and statistics), physiology, neuroscience, psychiatry, and other fields. Of particular importance for this discipline have been new methods for non-invasive functional neuroimaging of humans performing psychological tasks. As this field is reaching maturity, the National Science Foundation intends for the new cognitive neuroscience emphasis to spur the development of highly novel techniques and models directed toward enabling basic scientific understanding of a broad range of issues involving brain, cognition, and behavior. The emphasis at NSF will be placed on integration of the cognitive sciences, basic sciences, and engineering in service of insights into healthy functions of brain, cognition, and behavior.

The cross-disciplinary integration and exploitation of new techniques in cognitive neuroscience has generated a rapid growth in significant scientific advances. Research topics have included sensory processes (including olfaction, thirst, multi-sensory integration), higher perceptual processes (for faces, music, etc.), higher cognitive functions (e.g., decision-making, reasoning, mathematics, mental imagery, awareness), language (e.g., syntax, multi-lingualism, discourse), sleep, affect, social processes, learning, memory, attention, motor, and executive functions. Cognitive neuroscientists further clarify their findings by examining developmental and transformational aspects of such phenomena across the span of life, from infancy to late adulthood, and through evolutionary time.

New frontiers in cognitive neuroscience research have emerged from investigations that integrate data from a variety of techniques. One very useful technique has been neuroimaging, including positron emission tomography (PET), functional magnetic resonance imaging (fMRI), magnetoencephalography (MEG), optical imaging (near infrared spectroscopy or NIRS), anatomical MRI, and diffusion tensor imaging (DTI). A second class of techniques includes physiological recording such as subdural and deep brain electrode recording, electroencephalography (EEG), event-related electrical potentials (ERPs), and galvanic skin responses (GSRs). In addition, stimulation methods have been employed, including transcranial magnetic stimulation (TMS), subdural and deep brain electrode stimulation, and drug stimulation. A fourth approach involves cognitive and behavioral methods, such as lesion-deficit neuropsychology and experimental psychology. Other techniques have included genetic analysis, molecular modeling, and computational modeling. The foregoing variety of methods is used with individuals in healthy, neurological, psychiatric, and cognitively-impaired conditions. The data from such varied sources can be further clarified by comparison with invasive neurophysiological recordings in non-human primates and other mammals.

Findings from cognitive neuroscience can elucidate functional brain organization, such as the operations performed by a particular brain area and the system of distributed, discrete neural

areas supporting a specific cognitive, perceptual, motor, or affective operation or representation. Moreover, these findings can reveal the effect on brain organization of individual differences (including genetic variation), plasticity, and recovery of function following damage to the nervous system.

Hypotheses springing from the data of a cognitive science, social, developmental, or life span study can now in some instances be constrained by brain-based data. Strategies for collecting brain-based data that bear on cognitive/behavioral hypotheses include but are not limited to the following four examples. Other powerful strategies are expected to evolve in future.

- First, if a pattern of neural activity can be linked to a particular cognitive process, the presence of that pattern can be used as a marker of that cognitive process in studies of other mental performances.

- Second, data from studies of stimulus adaptation during neuroimaging can elucidate the character of mental representations in a particular neural system. Thus, as in the "looking time" paradigms used with infants, the neural sensitivity to the "sameness" of stimuli can be used to provide rich descriptions of equivalence classes, invariances, and non-invariances for neural representations in each cortical region.

- A third example of using brain data for evaluating cognitive hypotheses is experiments in which behavioral success on a given task is correlated with the intensity of a neuroimaging signal in a specific brain area. Such relationships between cognitive performance and neural activity are important indicators of a necessary relationship between a brain area and a component of cognitive/behavioral processing.

- Fourth, hypotheses derived from behavioral data suggesting separable processes can be evaluated with respect to the functional brain organization implied by cognitive neuroscience findings. If a given theory hypothesizes that two specific cognitive states are supported by the same underlying process, but an alternative assumes those states are supported by different processes, data from cognitive neuroscience might favor one account. Neuroimaging data from healthy humans can be refined by comparison with findings from studies of cognitive/behavioral impairments exhibited either by humans with discrete lesions (stroke patients), humans with implanted deep brain stimulators, healthy humans with transient neural disruptions (via TMS), or humans stimulated by a pharmacological agent.

  Moreover, cognitive neuroscience also can elucidate the duration and sequencing of sub-processes, for example, by integrating high temporal resolution MEG data with high spatial resolution fMRI within subject and task. Such finely calibrated data can then inform cognitive and behavioral process models. Finally, subsequent comparisons of brain organization across species may allow the neural basis of such processes to be understood in an evolutionary context.

II. PROGRAM DESCRIPTION

The Cognitive Neuroscience emphasis seeks sharply innovative proposals aimed at advancing a rigorous understanding of how the human brain supports thought, perception, affect, action, social processes, and other aspects of cognition and behavior. Topics may bear on core functions such as sensory, learning, language, reasoning, emotion, and executive processes, or more specialized processes such as empathy, creativity, representation of self and other, or intentionality, among many other possibilities. Topics may also include how such processes develop and change in the brain.

The program is particularly interested in supporting the development of new techniques and technologies for recording, analyzing, and modeling complex brain activity. Such projects should include a plan for sharing new software and other technologies with the research community at large.

Studies of disease states (e.g., brain damaged patients) may be components of projects supported by this program. However, the emphasis in such projects must be to advance basic scientific understanding of neural mechanisms, and not on disease etiology, diagnosis, or treatment.

The program also intends to foster projects that integrate perspectives across disciplines, e.g., from the cognitive sciences, developmental sciences, biology, computer science, engineering, education, anthropology, physics, mathematics and statistics. For example, projects that involve collaborations among individuals with expertise in one of the cognitive sciences, neuroimaging, neural microcircuitry, and modeling complex systems are strongly encouraged. Other interdisciplinary emphases are also of keen interest.

Examples of appropriate grant proposals include, but are not be limited to, the following. It is to be expected that scientific advances will overtake many of the following issues, and that other research and development matters will emerge as key enablers to progress in basic cognitive neuroscience.

- Approaches addressing research questions with a novel range of techniques (e.g., using neuroimaging, lesion-deficit data, and computational modeling).

- Hypotheses based on cognitive/behavioral/social/developmental research that lead to tests either of systems level or neuro-computational models of psychological processes. The computational models should involve vertical integration over realistic neural circuitry at specified scales.

- Development of new methods for acquisition-time representation of functional neuroimaging data, e.g., providing output which can be used to control online continuous, experimental manipulations of behavioral/cognitive (stimulus) variables.

- Study of the relation between cognitive/behavioral performance and structural

features of brain such as white/gray matter ratio, neurotransmitter sites, connectivity maps, unfolded topological models of cortex, morphology, or diffusion tensor imaging.

- Integrated use of techniques involving both human and animal models to provide convergent evidence about a specific research problem (e.g., the neural codes for perceptual representations, the role of endogenous neurochemicals in social bonding).

- Development of quantitative techniques for meta-analysis and modeling of functional neuroimaging data with respect to localization, temporal dynamics, and componential modeling of cognitive/behavioral processes.

- Neuroimaging of the infant and child brain for comparsion with adults in order to understand the development of functional brain organization.

- Development of new methods for characterizing the morphology of activation clusters in neuroimaging data (going beyond the stereotactic location of peak activation).

- Comparative gene expression studies in nonhuman primates of the neural regions governing higher cognitive functions within an evolutionary framework.

- Study of the development and character of specialization of brain areas for particular cognitive, perceptual, affective, and action processes.

- Development of new techniques for integrating independent measurements of the dynamic interactions in time and space of specific neural activity.

- Mathematical analyses of stable individual differences in brain organization (e.g., modeling individual differences in localized neural activity for elementary psychological operations).

- Adaptation of advanced experimental psychology methods for adults and children afflicted with neurological or cognitive impairments in order to characterize more fully the effects of dysfunctions of specific brain areas, clarifying thereby the functions of those areas. (For instance, do brain areas compromised by Parkinson's Disease support non-motor cognitive or executive functions?)

- The effect of environmental factors (impoverishment or enrichment) on the development and function of specific brain areas.

- Development of effective techniques for mapping receptor/ligand binding profiles during cognitive functions such as working memory, selective attention, and implicit memory in healthy humans.

FUNDING OPPORTUNTIES

(1) Individual Investigator Research Projects. Many research topics are studied most effectively by individual research scientists or by small teams of collaborating investigators. Investigators are invited to submit proposals that focus on cognitive neuroscience topics, including but not limited to those illustrated above.

(2) Workshops. Workshops will be supported that bring together diverse scientific partners around specific topics. Meetings will be focused on topics that can benefit from intensive small group discussions. It is anticipated that most workshops will require $15,000-$20,000 of support for 12 months, including indirect costs. However, larger requests will also be considered.

(3) Doctoral dissertation improvement grants. To improve training in neuroscientific approaches to cognitive, affective, perceptual, social, and developmental research, support will be provided to graduate students in the form of doctoral dissertation improvement grants. These awards can provide funds for items not normally available through the students' university, for significant data-gathering projects, and to conduct research away from the student's home campus. The maximum request can be $18,000 for 12 months, with no indirect costs, stipend, or tuition expenses allowed.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the Grant Proposal Guide are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

Estimated program budget (of about $7,000,000 annually), number of awards, and average award size/duration are subject to the availability of funds. It is anticipated that about 30 awards will be made annually.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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 (301) 947-2722 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program solicitation number (NSF 02-031) in the program announcement/solicitation block on the NSF Form 1207, *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 Announcement.

Indirect Cost (F&A) Limitations: Indirect costs are not allowed on Dissertation Improvement proposals.

C. Deadline/Target Dates

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

Full Proposals:

March 15, 2002
January 15 of each year starting in 2003
July 15 of each year

For 2002 only: Target date is March 15 rather than January 15.

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Announcement 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 1-800-673-6188 or e-mail fastlane@nsf.gov.

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 certifications within five working days following the electronic submission of the proposal. 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.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Proposers are reminded that both the intellectual merit and the broader impacts of the work to be accomplished should be addressed. While reviewers are expected to address both merit review criteria, each reviewer will be asked to address only considerations that are relevant to the proposal 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?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration 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 names of the 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 for 70 percent of proposals. The time interval begins on the date of receipt. 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 its 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. 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 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.

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 Cognitive Neuroscience should be made to:

- Lawrence M. Parsons, Cognitive Neuroscience, Program Director, Social, Behavioral, and Economic Sciences, Behavioral and Cognitive Sciences, 995 N, telephone: (703) 292-7249 (voice); (703) 292-9068 (fax), e-mail: lparsons@nsf.gov.

For questions related to the use of FastLane, contact:

- BCSFASTLANE@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-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.

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, Information Dissemination Branch, 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.

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