

# Decision Making Under Uncertainty Collaborative Groups (DMUU)

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## PROGRAM SOLICITATION NSF 09-544

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National Science Foundation

Directorate for Social, Behavioral & Economic Sciences  
Division of Social and Economic Sciences  
Division of Behavioral and Cognitive Sciences

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

July 14, 2009

### REVISION NOTES

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Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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**Program Title:**

Decision Making Under Uncertainty Collaborative Groups (DMUU)

**Synopsis of Program:**

The Decision Making Under Uncertainty (DMUU) collaborative groups competition offers awards to support teams of researchers who will advance fundamental understanding of decision making under uncertainty for climate change and related long-term environmental risks. The focus of these collaborative groups will be to generate fundamental new knowledge as well as information and tools that decision makers will find useful to help them incorporate climate change and related long-term environmental risks in their decision making. The focus of these collaborative groups should be to provide new knowledge about how public officials, firms in the private sector, other groups, and/or individuals can incorporate existing knowledge about climate change and related long-term environmental risks into their decisions. In addition to generating societally useful information and tools, DMUU collaborative groups should enhance basic understanding within and across the social and behavioral sciences as well as related science and engineering disciplines.

**Cognizant Program Officer(s):**

- Rita A. Teutonico, Lead DMUU Coordinator, telephone: (703) 292-7118, email: [rteutoni@nsf.gov](mailto:rteutoni@nsf.gov)
- Robert E. O'Connor, DMUU Program Director, telephone: (703) 292-7263, email: [roconnor@nsf.gov](mailto:roconnor@nsf.gov)
- Thomas J. Baerwald, DMUU Program Director, telephone: (703) 292-7301, email: [tbaerwal@nsf.gov](mailto:tbaerwal@nsf.gov)

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

- 47.075 --- Social Behavioral and Economic Sciences

### Award Information

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**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 4 to 5 NSF expects to support four to five collaborative groups through cooperative agreements between NSF and the lead institution.

**Anticipated Funding Amount:** \$5,000,000 per year, subject to the availability of funds. NSF expects to commit at least

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\$5,000,000 annually for support of DMUU collaborative groups from FY 2010 to FY 2014. Each collaborative group will be supported at a level of \$900,000 to \$1,500,000 annually for up to five years. Total support over five years therefore would range from \$4,500,000 to \$7,500,000 for each collaborative group. In FY 2013, collaborative groups may request renewal awards for an additional five years of support from FY 2015 to FY 2019.

### Eligibility Information

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#### Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

#### PI Limit:

None Specified

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

None Specified

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

None Specified

### Proposal Preparation and Submission Instructions

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#### A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: 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](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/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide))

#### B. Budgetary Information

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

#### C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):  
July 14, 2009

### Proposal Review Information Criteria

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

### Award Administration Information

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

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

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## I. INTRODUCTION

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Climate change and related long-term environmental risks pose great challenges to decision makers, including private citizens; informal and formal groups, firms, and organizations; and governments at all levels from the local to state, national, and international levels. Both dangers and opportunities exist when decision makers incorporate climate change and other long-term environmental risks into decisions.

NSF has funded a group of Decision Making Under Uncertainty (DMUU) collaborative groups for the past five years. The goals of DMUU collaborative groups have been to support research, education, and outreach that increase basic understanding of decision-making processes and of the information needed by decision makers; to develop tools to support decision makers and increase their ability to make sound decisions; and to facilitate interaction among researchers and decision makers. In addition, NSF's Human and Social Dynamics priority area supported interdisciplinary groups that addressed questions related to change and dynamics in human systems more broadly.

This new DMUU collaborative groups competition draws upon both of these past experiences to address the need for larger-scale projects addressing decision making under uncertainty with respect to climate change and other long-term environmental change. Through this competition, NSF seeks to stimulate societally beneficial research that will enhance basic theoretical understandings in the social and behavioral sciences as well as related fields of science and engineering.

## II. PROGRAM DESCRIPTION

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NSF expects to support a set of collaborative groups that will conduct research on decision making under uncertainty related to climate change and related environmental risks. In the context of this competition, decision making is defined broadly and includes actions associated with adaptation to climate change and related environmental risks as well as decisions associated with mitigation strategies. "Decision makers" is a term that is considered broadly and may include private citizens; informal and formal groups, firms, and organizations; and governments ranging from the local to state, federal and international levels. As scientific research has increased knowledge about the causes and consequences of climate change and related environmental risks, awareness has grown of the need to better understand how decision makers can identify and choose more effectively among alternative courses of action. The goals of NSF's Decision Making Under Uncertainty (DMUU) collaborative groups funding opportunity are:

- Improve understanding of all facets of decision making related to climate change and related long-term environmental risks for which much information exists but significant areas of uncertainty remain.
- Increase knowledge of the content and form of information needed by decision makers to make sound decisions.
- Develop tools to support decision makers and increase their ability to make sound decisions over multiple time scales.
- Facilitate interactions among researchers and decision makers, thereby enhancing fundamental research and increasing the speed with which new research findings are adopted and used by decision makers.

To accomplish these goals, NSF seeks proposals for interdisciplinary collaborative groups that will produce new knowledge, information, and tools related to decision making under uncertainty associated with climate change and related environmental risks. Collaborative groups are expected to conduct integrative research on scales larger than would be expected through individual research projects. The size, structure, collaborative arrangements, and operation of each group should be appropriate for the proposed research, education, and outreach activities. To be competitive, proposals should outline plans for a collaborative group that will do all of the following:

- **Conduct fundamental research on decision making associated with climate and related environmental change.** The research should be well grounded in relevant theoretical frameworks based in the social and behavioral sciences as well as other appropriate science and engineering disciplines. The proposed research program should advance basic understanding about decisions dealing with issues like risk perception, resilience and vulnerability, disaster reduction, trade-offs, equity, framing, tipping points, complexity, and probabilistic reasoning associated with risky phenomena. The research program should also advance understanding of decision making under uncertainty specifically associated with climate and related environmental change. Research conducted by the collaborative group must be interdisciplinary in character and draw on expertise from multiple disciplines.

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**Develop tools** that people, organizations, and governments can use to better understand the risks associated with climate and related environmental change and the options they have to address related risks. Proposals must address how the basic research can help people and/or organizations make better-informed decisions to cope with the potential consequences of climate change and related environmental risks.

- **Provide education and research opportunities for U.S. students and faculty.** The individuals and groups to be served through these educational efforts may be varied and may include undergraduate and graduate students, postdoctoral researchers, students from groups underrepresented in the social and behavioral sciences, K-12 teachers, and/or visiting scientists and engineers.
- **Develop and disseminate tangible products** for researchers, decision makers, and other relevant stakeholders. As part of its dissemination plan, the collaborative group may include the development of user-friendly web sites and/or other mechanisms to facilitate the dissemination of climate change information and its effective use in decision making.

The collaborative group must be based at a U.S. academic institution, where the collaborative group will be directed by a faculty member and integrated into the institution's academic programs. Other institutions, including non-academic institutions, may participate as partners with the lead institution, with their funding coming through subawards.

The collaborative group must consist of a multidisciplinary team of researchers, and the team's research must be firmly grounded in the social and behavioral sciences. The research may also draw on and contribute to theoretical frameworks based in other science and engineering disciplines. Collectively, collaborative group personnel should have the requisite expertise to pursue the research, tool-development, education, and outreach activities that they propose to undertake.

The collaborative group must establish a diverse external advisory board that will include both researchers and decision makers and that will provide guidance and advice on all group activities.

DMUU collaborative groups that were established in FY 2004 are eligible to participate in this competition, but other applicants also may submit proposals, with all proposals being evaluated based on their expected future contributions.

NSF will coordinate its activities with those of other federal agencies. Depending on the lines of research and products likely to result from funded collaborative groups and the interests of other agencies, additional support from other agencies may be available.

### III. AWARD INFORMATION

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Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Pending availability of funds, NSF expects to reserve approximately \$5,000,000 for DMUU collaborative group awards in FY 2010. Support for collaborative groups will be provided through cooperative agreements. NSF anticipates supporting four to five groups at levels of \$900,000 to \$1,500,000 annually for up to five years of support. During the fourth year of their operation, collaborative groups may be invited to submit a renewal proposal requesting up to five additional years of support, but the proposals submitted in response to this solicitation should focus solely on expected activities of the collaborative group for a five-year period from FY 2010 to FY 2014. No additional DMUU collaborative group competitions are expected. If a new competition is held in the future, a separate solicitation will be posted by NSF.

### IV. ELIGIBILITY INFORMATION

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#### Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

#### PI Limit:

None Specified

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

None Specified

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

None Specified

#### Additional Eligibility Info:

Although only academic institutions in the U.S. are eligible to submit proposals for this competition, other organizations may participate as partners with the lead academic institution and may be supported via subawards. Types of organizations that may participate as partners include non-profit, non-academic organizations, independent museums, observatories, research labs (including Federally Funded Research and Development Centers (FFRDCs) and other national labs), professional societies, and similar organizations in the U.S. associated with educational or research activities.

### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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## A. Proposal Preparation Instructions

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**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](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov). Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (<http://www.nsf.gov/pubs/policydocs/grantsgovguide607.pdf>). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

All sections of a proposal submitted in response to this solicitation must be in conformance with GPG or NSF Grants.gov Application Guide unless different specifications are made in this solicitation. Proposals not in conformance with the proposal-preparation requirements will be returned without review.

Please use the following definitions when providing information about personnel involved in the project:

- **Principal Investigators** (including PIs and Co-PIs)-- individuals who would assume responsibility for an award resulting from this competition, would manage the award, and are identified on the cover sheet of the proposal.
- **Senior Project Personnel** -- named individuals who will receive salary support as well as non-salaried senior investigators who will play lead roles in the work of the collaborative group. (This group includes all principal investigators.)
- **Project Participants** -- every person involved with the collaborative group, including students.

### Project Description

Project Descriptions may not exceed 20 pages. Proposers may organize the different components of the project description as they wish, but they should make clear what are the theoretical foundations and expected theoretical contributions of the proposed work, how research will be conducted in scientifically sound ways, how education and training will be conducted, what the project may seek to do to broaden participation of underrepresented groups in scientific research, what products are expected to result from this work, and how the results will be disseminated in both scholarly and practical settings. In addition to the required sections described in the GPG or NSF Grants.gov Application Guide, the Project Description should include:

- Narrative description of the focus, research plans, and relevance. Develop a research focus of sufficient scope and depth to justify a collaborative group form of organization and long-term investment. Describe mechanisms to permit change as the research progresses. Discuss some of the likely tools that will be developed from this activity.
- Educational and human resource development. Discuss the rationale and goals of the proposed education and human resource development activities and how they integrate strategically with the research, tool development, and outreach components of the group.
- Outreach activities. Describe products that are expected to result from the project and plans for linking appropriate communities and institutions beyond the sponsoring institution to enhance involvement and knowledge transfer. Partnerships and linkages beyond the boundaries of the academic institution are to be emphasized here.
- Management plan. Provide a description of the organizational structure of the collaborative group. Specify which individuals will have responsibilities for which projects and activities as well as for overall coordination and management. Outline mechanisms for focusing collaborative group activities, selecting and integrating related research and tool development projects, allocating funds and equipment across all collaborative group activities, and managing the involvement of other individuals and groups, including decision makers and other stakeholders. Describe the role and composition of a diverse external advisory board that will include both researchers and decision makers and that will provide guidance and advice on all collaborative group activities.
- Rationale for the group. Specify why a collaborative group is necessary and what unique opportunities will be provided by the proposed collaborative group.

### Supplementary Documentation

Items 1, 2 and 3 should be included in this section if needed. **Item 4 is required to be included in this section for all proposals.**

1. Include in this section letters of commitment from any entity that is an integral part of the proposed project, such as the involvement of an international collaborator or permission to access sites, materials, or data for research or other associated project activities. Generic letters of endorsement are not allowed, however.
  2. IRB certifications associated with the protection of human subjects or IACUC certifications associated with the protections of animals subjects may be included in this section.
  3. Include a 1-page supplementary document describing mentoring activities that will be provided for post-doctoral researchers if individuals at that level will be supported through the collaborative group.
  4. Provide a description of the project's data management and access plan as a maximum 1-page supplementary document. This information should be clearly identified by the subheading "Data Management and Access." NSF realizes that individual cases may differ widely and recognizes that any absolute timeline or rigid set of rules is not possible.
- Plans should address some or all of the following issues:
    - The types of data and samples to be produced in the project;
    - The standards for data format and metadata content that will be used (where existing standards are absent or inadequate, this should be pointed out for the benefit of the program and the reviewing community)

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- Policies for access including provisions for appropriate protection of privacy, confidentiality or intellectual property rights;
- Policies for re-use, distribution, or the production of derivatives; and
- Plans for archiving data and samples and preservation of access.

The data management and access plan will be subject to reviewer, panel, and program evaluation. Successful applicants will be expected to address data management and access in annual and final project reports and within the Results of Prior Research section when they submit subsequent proposals to NSF.

Unless authorized here or in the Grant Proposal Guide, no other materials should be included in this section. Survey or interview protocols are not permitted in this section, nor are reprints of articles previously published by the investigators. Proposals that include materials in this section that belong in the project description may be returned without review.

### Conflicts of Interest

In addition to the formal submission of the proposal, the principal investigator must send by e-mail a compilation of conflicts of interest information in a spreadsheet format directly to first cognizant Program Officer listed above. The spreadsheet must be submitted by no later than July 21, 2009, which is one week after the proposal-submission deadline.

The top of the list should include the proposal number. Include the full names of all people for whom there would be a conflict of interest related to reviewing this proposal because of their association with one or more of the senior personnel on the project. Conflicts to be identified are: (1) PhD thesis advisors or advisees, (2) postdoctoral advisors or advisees, (3) collaborators or co-authors for the past 48 months, and (4) any other individuals or institutions with which the investigator has financial ties (please specify type). For further clarification of conflicts of interests, please refer to the NSF Award and Administration Guide, Chapter IV.A. Three columns are suggested for the spreadsheet: People for whom there is a conflict, the senior personnel whose relationship makes the person in that row conflicted, and the relationship that causes the conflict of interest.

### Proposals Involving Multiple Institutions

In the case of proposals involving multiple institutions, a single institution should be identified as the lead and a single proposal describing the entire project should be submitted by that institution. Funds may be distributed among partner institutions via subawards from the lead institution. A budget on the standard NSF budget form should be submitted for each subawardee. Letters confirming collaborations can be scanned and submitted via FastLane or Grants.gov as Supplementary Documentation. If multiple proposals seeking support for a single collaborative group (often called "separately submitted collaborative proposals") are submitted, all proposals in the set will be returned without review.

### Proposals Involving Collaborators at Foreign Organizations

Proposers are reminded they must provide biographical sketches of all senior project personnel, including those at foreign institutions. In addition, as supplementary documentation, proposals involving foreign organizational collaborators must provide letters of commitment from the foreign counterpart institutions. Please note that although eligibility for this competition is restricted to U.S. organizations, as described in the GPG, collaborations with foreign institutions may be considered. Any funding for non-U.S. organizations must be made through subawards. Those subawards to non-U.S. organizations may not include any indirect costs.

### Human Subjects

If the project involves human subjects, the Institutional Review Board (IRB) of the submitting organization must certify that the proposed project is in compliance with the Federal Government's "Common Rule" for the protection of human subjects. If IRB approval has been obtained and the date of approval is listed on the cover sheet, no other certification is required. If IRB approval is still pending, submit certification of IRB approval in electronic form as soon as approval is obtained to the cognizant program officer. (The name of this program officer will be listed in the Proposal Status module of FastLane.) Delays in obtaining IRB certification may result in NSF being unable to make an award. For more information regarding the protection of human subjects, consult <http://www.nsf.gov/bfa/dias/policy/human.jsp>.

### Pre-Submission Checklist

Proposals submitted must be in compliance with GPG and with special requirements in this solicitation in order to be considered for review. Proposals not in compliance with these requirements will be returned without review. Please refer to the following checklist to ensure that your proposal is compliant:

- Font and margin requirements
- Page numbers on pages
- Project summary that includes a description of intellectual merit and broader impacts
- Project description that is 20 pages or less in length
- Project description that includes separate sections for results from prior NSF support (if appropriate), broader impacts, and other special sections specified in this solicitation.
- Biographical sketches for all senior personnel
- Current and Pending Support forms for all senior personnel
- Data Management and Access statement included as Supplementary Documentation.
- If appropriate, letters of commitment from any entity that is an integral part of the proposed project and/or a statement describing mentoring activities that will be provided for post-doctoral researchers included as Supplementary Documentation.
- Conflict of Interest list submitted to the cognizant Program Officer by e-mail. The list should be provided in alphabetized order by last name of the individuals who would have a conflict of interest related to the evaluation of this proposal.

## B. Budgetary Information

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**Cost Sharing:** Cost sharing is not required under this solicitation.

**Budget Preparation Instructions:** The collaborative group must participate in each of the set of annual conferences to be held from 2010 through 2014 that will bring together researchers from all collaborative groups funded by this activity and possibly other scholars and stakeholders. The costs to enable at least one representative from each collaborative group to attend the annual conference should be included in the collaborative group budget request.

## C. Due Dates

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

July 14, 2009

## D. FastLane/Grants.gov Requirements

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- **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](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 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](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

**Submitting the Proposal:** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

## VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. 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 of interest with the proposal.

### A. NSF Merit Review Criteria

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All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

**What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

NSF staff also 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 National Science Board-approved review criteria, NSF will ask reviewers and panel members to evaluate proposals based on the appropriateness of the proposed research and related activities for this competition as well as the goals and special requirements outlined in this solicitation for each of the special sections to be included in the Project Description, including the management plan, education and human resources development, outreach activities, and the rationale for a collaborative group. Reviewers and panel members also will be asked to assess mentoring plans for post-doctoral researchers that have been specified within the proposal.

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

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, or Site Visit Review.

Proposals will be evaluated by an advisory panel that is convened to review all proposals submitted in response to this solicitation. Panel members will be drawn from a diverse set of relevant disciplines. Proposals may also be evaluated by ad hoc reviewers with expertise in one or more facets of activities described within specific proposals. Following the conduct of the advisory panel, sites visits will be conducted at institutions submitting the most highly recommended proposals.

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 deadline or target date, or receipt date, whichever is later. 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.

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## **VII. AWARD ADMINISTRATION INFORMATION**

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### **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.)

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### **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 Research 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



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[http://www.nsf.gov/awards/managing/award\\_conditions.jsp?org=NSF](http://www.nsf.gov/awards/managing/award_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](mailto: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 Award & Administration Guide (AAG)* Chapter II, available electronically on the NSF Website at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=aag](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

### C. Reporting Requirements

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

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

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

### VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- Rita A. Teutonico, Lead DMUU Coordinator, telephone: (703) 292-7118, email: [rteutoni@nsf.gov](mailto:rteutoni@nsf.gov)
- Robert E. O'Connor, DMUU Program Director, telephone: (703) 292-7263, email: [roconnor@nsf.gov](mailto:roconnor@nsf.gov)
- Thomas J. Baerwald, DMUU Program Director, telephone: (703) 292-7301, email: [tbaerwal@nsf.gov](mailto:tbaerwal@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

For questions relating to Grants.gov contact:

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

### IX. OTHER INFORMATION

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The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service 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 when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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>.

### ABOUT THE NATIONAL SCIENCE FOUNDATION

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The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US

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participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
  - Send an e-mail to: [pubs@nsf.gov](mailto:pubs@nsf.gov)
  - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton  
Reports Clearance Officer  
Division of Administrative Services  
National Science Foundation  
Arlington, VA 22230

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