

Environmental Molecular Science Institutes (EMSI)

Program Solicitation

NSF 04-509

Replaces Document nsf 02-015



National Science Foundation

Directorate for Mathematical and Physical Sciences

Division of Chemistry

Directorate for Geosciences

Division of Earth Sciences

Division of Atmospheric Sciences



U.S. Dept. of Energy

Letter of Intent Due Date(s) (required):

January 26, 2004

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

March 08, 2004

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Environmental Molecular Science Institutes (EMSI)

Synopsis of Program:

The Environmental Molecular Science Institutes (EMSI) Program supports cohesive, interdisciplinary group efforts in environmental molecular science by US academic institutions and non-profit non-academic organizations. Many EMSIs include partnerships with industry, international institutions and/or national laboratories. This program will increase our fundamental, molecular-level understanding of natural and anthropogenic processes in the environment. Basic research in these areas underpins our understanding of molecular-scale phenomena in chemistry and geochemistry and informs efforts to prevent and ameliorate environmental problems caused by societal activities. Projects are expected to advance the disciplines of chemistry and the geosciences. They should also focus on increasing our understanding of environmental

systems, serve as models for excellence in collaborative interdisciplinary research, and contribute ultimately to the development of beneficial technologies and processes. An EMSI typically supports a group of six or more investigators with complementary research interests. EMSIs require an effective management structure and include a variety of educational and outreach activities. In particular, EMSIs are expected to create broad interdisciplinary educational opportunities. The use of cyberinfrastructure to facilitate and enable collaboration and sharing of data is encouraged. The National Science Foundation and US Department of Energy are partnering in the EMSI Program to ensure that the strongest possible programs are supported with the limited funds available and to concentrate resources to realize measurable progress in focused research areas.

Cognizant Program Officer(s):

- Katharine J. Covert, Program Director, Chemistry Collaboratives and Special Projects, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4950, fax: (703) 292-9037, email: kcovert@nsf.gov
- Janice M. Hicks, Program Director, Analytical and Surface Chemistry, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4956, fax: (703) 292-9037, email: jhicks@nsf.gov
- Rachael Craig, Program Director, BioGeoscience Program, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8233, fax: (703) 292-9025, email: rcraig@nsf.gov
- Bruce Doddridge, Program Director, Atmospheric Chemistry, Directorate for Geosciences, Division of Atmospheric Sciences, 775 S, telephone: (703) 292-8522, fax: (703) 292-9022, email: bdoddrid@nsf.gov
- Teresa Fryberger, Director, Division of Environmental Remediation Sciences (SC-75), Office of Biological and Environmental Sciences, US Department of Energy, telephone: 301-903-4902, email: teresa.fryberger@science.doe.gov

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

- 47.050 --- Geosciences
- 47.049 --- Mathematical and Physical Sciences

Eligibility Information

- **Organization Limit:**

Eligibility is limited to US academic institutions or non-profit non-academic organizations as described in the Grant Proposal Guide (GPG).

Collaborations with international, industry and/or national laboratory partners are encouraged, although NSF funds cannot go to these organizations. DOE national lab personnel may request funding from DOE under this solicitation. Please see the budget preparation section or contact a cognizant program officer to discuss these collaborations.

- **PI Eligibility Limit:**

An investigator may participate in one EMSI proposal as a funded senior investigator (PI, co-PI, or equivalent).

- **Limit on Number of Proposals:** 1. No institution or organization may submit more than one proposal to this

competition. For consortium proposals, a single investigator must be designated as the project director and a single institution or organization must submit the proposal (with subawards as appropriate) and accept overall management responsibility.

Award Information

- **Anticipated Type of Award:** Continuing Grant
- **Estimated Number of Awards:** 2 to 4 - new and/or renewal awards of up to \$1.5 million per year for up to five years, depending on the quality of submissions and the availability of funds
- **Anticipated Funding Amount:** \$3,000,000 per year, pending availability of funds. Additional funds may be available from DOE or other NSF Divisions

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

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 text of this solicitation for further information.

C. Due Dates

- **Letters of Intent (*required*):**
January 26, 2004
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
March 08, 2004

Proposal Review Information

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

Award Administration Information

- **Award Conditions:** Additional award conditions apply. Please see the full text of this solicitation for further information.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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I. INTRODUCTION

Environmental Molecular Science Institutes (EMSI) will increase fundamental molecular-level understanding of natural and anthropogenic processes in the environment. These institutes encourage cohesive interdisciplinary group efforts in basic research involving researchers from US academic institutions and non-profit non-academic organizations collaborating with international organizations, industry and national laboratories.

The disciplines that focus on molecular processes (chemistry, geochemistry and biogeochemistry) play a central role in addressing the needs for fundamental understanding, the assessment of risks and the development of technology in environmental areas. Understanding how fundamental molecular-level processes couple with one another and how they determine the behavior of a macroscopic natural system is a major scientific challenge. The complexity of the underlying molecular systems and processes and the range from the laboratory scale to the ecosystem scale require multidisciplinary research programs and education.

Topical areas appropriate for this competition include environmental impacts of energy production; benign chemical and materials synthesis and processing for pollution prevention; methods to improve or protect air and water quality; investigation of contaminant and nutrient speciation, sorption, transport, and bioavailability at interfaces; the integrity of underground waste-disposal systems; global cycling of the elements; the development of soils and distribution of plant nutrients; clean sources of energy including nuclear energy and related waste disposal; solvation and transport in aqueous systems across the entire range of temperature and pressure regimes found in natural environments; and integrated understanding of the response of a specific environment to chemical perturbations caused by human activities. The cooperative efforts of chemists, geoscientists and bioscientists will be critical to successfully addressing these issues.

Of particular interest are collaborations that would make use of the specialized capabilities available at DOE-funded research facilities, such as the William R. Wiley Environmental Molecular Sciences Laboratory at the Pacific Northwest National Laboratory <http://www.emsl.pnl.gov> and the DOE synchrotron light sources and nanoscience centers <http://www.science.doe.gov/feature/BES.htm>.

Previous competitions have led to five-year awards supporting six EMSIs. This solicitation describes the FY 2004 competition for new and renewing EMSIs. This competition provides an opportunity for funding two to four new and/or renewed EMSIs. NSF Chemistry will provide approximately \$3.0 million per year for EMSIs beginning in FY 2004, subject to availability of funds and quality of proposals. Additional funds from DOE of up to \$1.0 million per year and additional funds from other NSF Divisions may also be available. Program Officers from NSF Divisions of Chemistry, Earth Sciences and Atmospheric Sciences and DOE Divisions of Chemical Sciences and Geosciences & Biosciences will jointly manage the review process.

II. PROGRAM DESCRIPTION

EMSIs support teams of faculty, scientists from national laboratories and industry (typically six or more investigators) who target broad areas of importance to the environment and energy. Research supported by EMSIs will focus on probing structures and processes at the molecular level and their relevance to the environment. The range in spatial and temporal scales offers unique challenges. Proposers are invited to take a fresh look at environmental challenges and to develop activities around a unified theme. Examples of areas appropriate for consideration as part of this program include, but are not limited to:

- Understanding and modeling the distribution, composition, origin, and behavior of molecular-scale structures under a wide variety of naturally occurring physical, chemical and biological conditions, including interactions at interfaces such as surfaces or aerosols.
- Investigating new chemical approaches for reducing the negative environmental effects of energy production and use, industrial chemical processes, and waste disposal/treatment.
- Understanding the mechanism, dynamics and specificity of the interaction of chemical, biological and radiological entities in the environment as a result of intentional or accidental human acts; the development of sensors that are specific, low cost, robust, and readily deployable for monitoring these entities; and the development of predictive models for the fate and transport of these entities.
- Understanding how key processes are coupled across spatial and temporal scales--from the laboratory to the ecosystem.
- Investigating the fundamental properties of water and water solutions important in environmental processes, the molecular level structure of water and ice, and water treatment chemistry.

To be considered, a proposal must contain a significant amount of molecular-level research that advances chemical disciplines. Proposals that merely use chemical methods are typically inappropriate and will be returned without review.

Environmental Molecular Science Institutes (EMSIs) should serve as national models and resources for excellence in collaborative environmental research. An EMSI may be based on traditional models of an institute at a specific physical location or as a dispersed institute. The use of cyberinfrastructure to facilitate and enable collaboration and sharing of data is encouraged. To strengthen the probability that the proposed basic research will contribute in the future to improve technologies and processes, collaborations with appropriate industries and national laboratories are strongly encouraged. Understanding the molecular behavior of complex and dynamic environmental systems is expected to require interdisciplinary approaches involving scientists from multiple academic disciplines and to provide an exciting educational environment.

Each EMSI must have a focused research theme and specific goals; the research should not be a collection of existing projects. EMSIs are expected to have substantial education and outreach activities integrated with the research activities, including dissemination to the broader scientific community, industry and the public. The organization and management

structure must be designed to meet these goals. Funding of up to \$1.5 million per year for five years is appropriate and could include a significant component of instrumentation resources, outreach support and infrastructure support.

Before expiration of the grant, successful EMSIs will be eligible to compete for renewal. This may occur in the fourth year of the grant. The NSF reserves the right to terminate the EMSI program at any time. While this would not affect an existing award, it would eliminate the possibility of renewal.

III. ELIGIBILITY INFORMATION

Eligibility is limited to US academic institutions or non-profit non-academic organizations as described in the GPG.

Collaborations with international, industry and/or national laboratory partners are encouraged, although NSF funds cannot go to these organizations. DOE national lab personnel may request funding from DOE under this solicitation. Please see the budget preparation section or contact a cognizant program officer to discuss these collaborations.

No institution or organization may submit more than one proposal to this competition. For consortium proposals, a single investigator must be designated as the project director and a single institution or organization must submit the proposal (with subawards as appropriate) and accept overall management responsibility.

An investigator may participate in one EMSI proposal as a funded senior investigator (PI, co-PI, or equivalent).

To be considered in the EMSI competition, a proposal must contain a significant amount of molecular level research that advances chemical disciplines. Proposals that merely use chemical methods are topically inappropriate and will be returned without review.

IV. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Under this solicitation, proposals may be submitted for up to five years for any funding amount up to \$1.5 million per year per proposal. Grants may be awarded in a variety of sizes and durations. NSF expects to fund 2-4 Institutes, depending on the quality of submissions and the availability of funds. It is anticipated that approximately \$3 million will be available from NSF for this initiative in FY 2004. In addition, up to \$1 million may be available from DOE in support of proposals that have the potential to contribute to DOE's mission, objectives and long term goals. Anticipated date of new and/or renewal awards: September 2004.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent (*required*):

Electronic Letters of Intent (required) should be submitted over webform <http://www.nsf.gov/mps/divisions/che/news/EMSILetter.htm> by 5:00 PM local time, Monday, January 26, 2004. Do not send hard copies. The main purpose of the letter is to enable NSF and DOE to plan the review process by providing an estimate of the number and topical breadth of proposals expected and the organizations involved. The letters of intent will not be merit reviewed. Proposal review and funding

recommendations will be based on the full proposals.

The letters of intent will contain the following:

- Title
- Brief description of the proposed EMSI (2500 ASCII characters), including the unifying theme
- PI name, contact information, lead institution
- All other investigators and their organizations

Full Proposal Instructions:

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 Website 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.

The Project Description should clearly define the EMSI and its goals, describe how the desired goals will be achieved and how the success of the EMSI will be evaluated. Proposers are expected to construct an appropriate organization and structure that will maximize the EMSI's effectiveness and impact.

The leadership of an EMSI should be provided by a small group, including a director and, if appropriate to the size of the EMSI, an associate director. The director of an EMSI should be a respected scientist with demonstrated organizational, managerial, and leadership ability. A committee of scientists from the participating organizations should provide scientific guidance. An EMSI should also have an advisory committee including some scientists that are not supported by the EMSI. Although a consortium of several organizations may be involved, a single academic institution or non-profit non-academic organization must accept overall management responsibility.

The GPG describes the general format required for proposals. The following instructions deviate from the GPG.

The Project Description in the full proposal will be subject to the page limitations for each section described below. Proposals not adhering to these limits will be returned without review.

- Detailed description of the intellectual focus and rationale for the EMSI, its overall goals, and expected impact (3 pages, maximum);
- Planned scientific activities over the duration of the EMSI and the roles of the various partners (15 pages, maximum);
- Plans for human resource development, including involvement of undergraduate students, graduate students, and postdoctoral associates. Plans to attract and effectively involve individuals from under-represented groups (2 pages, maximum);
- Description of planned outreach activities and dissemination to the broader community (2 pages, maximum);
- Description of expected outcomes and how the impact will be demonstrated and evaluated (2 pages, maximum);
- Description of the organizational structure of the EMSI, clearly outlining the proposed management structure, mechanisms for focusing EMSI activities, methods for selecting and integrating areas of research emphasis, criteria for selection of participants, procedures for allocation of funds and equipment, and mechanisms for responding to new opportunities as they arise (4 pages, maximum); and
- Results of Prior Support: Renewal EMSI proposals should provide the NSF award number and title, amount and period of support, a summary of the research outcomes (a list of publications can be included in the References Cited section), and a summary of education and outreach activities (5 pages, maximum).

Each biographical sketch is limited to two pages. Investigators with other (non-EMSI) prior NSF support within the past five years should briefly summarize their NSF support on their Biographical Sketch.

A required supplemental document is a combined, alphabetized list of all collaborators and conflicts of interest for the

proposal investigators. Optional supplemental documents might include letters of collaboration, short quotes for requested instrumentation and budgets to support DOE investigators (see below). Endorsement letters are inappropriate. No appendices are permitted.

For collaborative activities involving DOE national laboratories, the cost of DOE resources (user fees, equipment charges, research personnel, etc.) that will be made available should be described in detail in the research proposal; arrangements for resources should be discussed with the appropriate DOE program manager before submission. A draft budget for the DOE collaborator should be included as supplemental documents.

Support for collaborations with international scientists is provided through the NSF grant to the submitting U.S. institution, and no NSF funds may go to foreign institutions. The proposal may include up to \$100,000 in participant support costs, over the duration of the grant, for international collaborative research activities. Travel and incidental research costs may be included; salaries may not. These international interactions must feature a joint scientific work plan and should be clearly described in the Project Description. If, after review, a proposal is recommended for funding, the EMSI Program Officer will work with Program Officers from NSF's International Programs, DOE Program Officers and the key project personnel to develop a detailed plan consistent with applicable international arrangements.

Proposers are reminded to identify the program announcement/solicitation number (04-509) in the program announcement/solicitation block on the proposal Cover Sheet. 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:

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

Other Budgetary Limitations:

Proposals may request up to \$1.5 million per year for up to five years.

The proposal budget should include funds for up to three EMSI personnel (including the EMSI Director) to attend a total of two meetings during the five-year award duration. These meetings will be held in Arlington, VA on dates to be announced.

Budget Preparation Instructions:

For consortium proposals, a single principal investigator must be designated as the project director and a single academic institution or non-profit non-academic organization must submit the proposal (with subawards as appropriate) and accept overall management responsibility.

The proposal budget may include funds for instrumentation or equipment to support the proposed research activities. No cost-sharing or matching is required. All instrumentation/equipment requests should be carefully justified in the proposal and listed on line D of the first year's proposed budget.

For collaborative activities involving DOE national laboratories, the cost of DOE resources (user fees, instrument charges, research personnel, etc.) that will be made available should be described in the research proposal. Arrangements for resources should be discussed with the cognizant DOE program officer before submission. If funds are requested to support DOE personnel, a draft DOE budget should be included as a supplemental document.

The NSF encourages collaborations with scientists at foreign institutions; however, primary support for any foreign participants/activities must be secured through their own national sources. For foreign participants, the proposer may request

up to \$100,000 in participant support costs for travel and per diem for visits to the US institution or organization, as consistent with applicable international agreements. No NSF funds may go to foreign institutions.

No NSF or DOE funds will be provided to support collaborative activities involving non-DOE national laboratories or industry. However, it is appropriate to request NSF or DOE funds to support researchers' (undergraduate and graduate students, postdoctoral associates and senior personnel) travel to partner sites (international, industrial, or national laboratory) to conduct experiments.

C. Due Dates

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

Letters of Intent (*required*):

January 26, 2004

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

March 08, 2004

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/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. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/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 National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will

employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). 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 judgments.

What is the intellectual merit of the proposed activity?

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

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

Reviewers will also be asked to consider the following EMSI-specific criteria:

- Quality of the scientific activities and their potential for impact on environmental chemistry and solutions to environmental problems;
- Interdisciplinary approach taken (both in degree and quality);
- Capabilities of the EMSI leadership, including managerial and organizational ability of the director and of the proposed leadership team;
- Quality and anticipated effectiveness of the management plan;
- Quality of the EMSI's education and training components, especially plans to attract and effectively involve individuals from under-represented groups;
- Quality and effectiveness of proposed outreach activities and dissemination of results to the broader community, including related scientific fields, industry and the public;
- Clarity of mission and goals and quality of the evaluation plan; and
- Character and quality of the institutional (multi-institutional) environment and potential for the EMSI to flourish in this setting.

Additional Review Criteria for Renewal Proposals: In addition to the above criteria for review, renewal proposals will be evaluated using the following criteria:

- Demonstrated management capabilities and organizational structure of the EMSI;
- Collaborations and extent of interdisciplinary approaches, communications and interactions with other areas of science and engineering carried out by the EMSI;
- Effectiveness of education and outreach programs;
- Effectiveness in promoting participation by members of underrepresented groups; and
- Outreach and dissemination of results achieved by the EMSI.

Additional Review Criterion for Proposals Partnering with DOE National Laboratories:

- Quality and effectiveness of the collaborations as related to the DOE activities, mission, priorities and long term goals.

Site visits or reverse site visits may be part of the EMSI review process.

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 Ad Hoc 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.

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.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program 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 Website 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 Website 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 Website at <http://www.gpo.gov>.

Special Award Conditions:

Institutes (EMSI) should plan for a formal site visit by NSF at the midpoint of an award.

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. Failure to provide final

technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. 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. 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 this program should be made to:

- Katharine J. Covert, Program Director, Chemistry Collaboratives and Special Projects, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4950, fax: (703) 292-9037, email: kcovert@nsf.gov
- Janice M. Hicks, Program Director, Analytical and Surface Chemistry, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4956, fax: (703) 292-9037, email: jhicks@nsf.gov
- Rachael Craig, Program Director, BioGeoscience Program, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8233, fax: (703) 292-9025, email: rcraig@nsf.gov
- Bruce Doddridge, Program Director, Atmospheric Chemistry, Directorate for Geosciences, Division of Atmospheric Sciences, 775 S, telephone: (703) 292-8522, fax: (703) 292-9022, email: bdoddrid@nsf.gov
- Teresa Fryberger, Director, Division of Environmental Remediation Sciences (SC-75), Office of Biological and Environmental Sciences, US Department of Energy, telephone: 301-903-4902, email: teresa.fryberger@science.doe.gov

Proposals requesting support for DOE co-investigators should contact Dr. Fryberger to discuss arrangements for resources.

For questions related to the use of FastLane, contact:

- Paul G. Spyropoulos, Computer Specialist, Directorate for Mathematical & Physical Sciences, Division of Chemistry, 1055 S, telephone: (703) 292-4968, fax: (703) 292-9037, email: pspyropo@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 Website 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) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

Related Programs:

- Collaborative Research in Chemistry ([NSF 03-583](#))
- International Opportunities for Scientists and Engineers ([NSF 03-559](#))
- Integrated Carbon Cycle Research Program ([NSF 03-582](#))
- 2003 Environmental Technologies and Systems ([NSF 03-510](#))
- EPA/NSF Partnership for Environmental Research ([NSF 00-152](#))
- Chemical Bonding Centers Phase I ([NSF 03-606](#))
- Cooperative Activities in Environmental Research between the National Science Foundation and the European Commission: Ecology and Oceanography of Harmful Algae ([NSF 03-580](#))
- Discovery Corps Fellowships ([NSF 03-596](#))
- Earth Sciences Research at the National Science Foundation ([NSF 03-590](#))
- Earth Sciences: Instrumentation and Facilities ([NSF 04-507](#))
- Science and Technology Centers: Integrative Partnerships ([NSF 03-550](#))
- Sensors and Sensor Networks ([NSF 03-512](#))
- NSF-NIST Interaction in Chemistry, Materials Research, Molecular Biosciences, Bioengineering and Chemical Engineering ([NSF 03-568](#))
- Biocomplexity in the Environment (BE): Integrated Research and Education in Environmental Systems ([NSF 03-597](#))
- Undergraduate Research Centers ([NSF 03-595](#))

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