

Environmental Molecular Science Institutes (EMSI)

Program Solicitation

NSF 02-015

NATIONAL SCIENCE FOUNDATION

DIRECTORATE FOR MATHEMATICAL AND PHYSICAL SCIENCES: DIVISION
OF CHEMISTRY

DIRECTORATE FOR GEOSCIENCES: DIVISION OF EARTH SCIENCES

DEPARTMENT OF ENERGY

OFFICE OF BASIC ENERGY SCIENCES

LETTER OF INTENT DUE DATE(S) (*optional*): December 14, 2001

FULL PROPOSAL DEADLINE(S): February 21, 2002



NATIONAL SCIENCE FOUNDATION



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Environmental Molecular Science Institutes (EMSI)

Synopsis of Program: This program is aimed at increasing fundamental understanding of natural processes and processes resulting from human activities in the environment at the molecular level. This program will support cohesive, interdisciplinary group efforts by universities, including partnerships with industry and/or other governmental agencies. This solicitation focuses on basic research on fundamental issues that underpin our understanding of the relationship of molecular scale phenomena in chemistry and geochemistry, and on the prevention and the amelioration of environmental problems caused by societal activities that are energy- and pollution- intensive. Projects are expected to advance the disciplines of chemistry, including actinide chemistry, and/or the geosciences. They should also focus on increasing our understanding of environmental systems, and serve as models for excellence in collaborative interdisciplinary research, and contribute ultimately to the development of beneficial technologies and processes. Specifically, this competition will support Environmental Molecular Science Institutes (EMSIs). An EMSI award typically supports groups of 6 or more investigators with complementary research interests and creates broad educational experiences for students. EMSIs require an effective management structure, and include a variety of educational and outreach activities.

Collaborative Research Activities in Environmental Molecular Sciences (CRAEMS) program, which was part of the FY 2000 EMSI - CRAEMS solicitation, is no longer a part of this program and is now part of the Collaborative Research in Chemistry (CRC) program. Consult the CRC program announcement (NSF 01-165) for further details.

Cognizant Program Officer(s):

- Dr. Joseph A. Akkara, Program Director, Mathematical and Physical Sciences, Chemistry, 1055, telephone: 703-292-4946, e-mail: jakkara@nsf.gov.
- Dr. David D. Lambert, Program Director, Geological Sciences, Earth Sciences, 785, telephone: 703-292-8558, e-mail: dlambert@nsf.gov.
- Dr. Paul H. Smith, Team Leader (Acting), US Department of Energy, Office of Basic Energy Sciences, telephone: 301-903-5806, e-mail: Paul.H.Smith@science.doe.gov.

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

- 47.049 --- Mathematical and Physical Sciences

ELIGIBILITY INFORMATION

- **Organization Limit:** Eligibility is limited to colleges, universities, and other not-for-profit institutions in the U.S. and its territories, as described in detail in the Grant Proposal Guide (NSF 01-2A). Non-profit research institutions include botanical gardens, marine and freshwater institutes, and natural history museums. 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 US university may provide funds under participant support costs for travel and per diem for visits to the US institution, as consistent with applicable international agreements. No US funds may go directly to foreign institutions.

- **PI Eligibility Limit:** A Principal Investigator may submit only one proposal to this competition and may only collaborate on one other proposal as a Co-Principal Investigator.
- **Limit on Number of Proposals:** No institution may submit more than one proposal to this competition. Proposals already submitted to other NSF programs or other federal agencies are not eligible for consideration in this competition. A Principal Investigator may submit only one proposal to this competition and may only collaborate on one other proposal as a Co-Principal Investigator. When consortia of eligible institutions submit a proposal, a single principal investigator must be designated as the project director and a single institution must accept overall management responsibility. Collaborations with researchers from industry and/or government laboratories are strongly encouraged. For this program, collaborating scientists associated with entities such as national laboratories, state agencies, and non-NSF Federally Funded Research and Development Centers (FFRDC) must be supported by their own institution. However, it is appropriate for students - undergraduate, graduate and postdoctoral - supported through universities to work at a FFRDC or comparable site, or for universities to fund research expenses incurred when scientists from such entities work at university sites. Federal employees may not receive salaries or in other ways augment their agency's appropriation through grants made by this program, and no funds for major equipment at FFRDCs are allowed.

AWARD INFORMATION

- **Anticipated Type of Award:** Continuing Grant
- **Estimated Number of Awards:** Three to five
- **Anticipated Funding Amount:** Up to \$1.5 million per year per award, pending availability of funds

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full program announcement/solicitation for further information.
- **Full Proposals:** Deviations From Standard Preparation Guidelines
 - The program announcement/solicitation contains deviations from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is Specialized. Please see the full program solicitation for further information.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Deadline/Target Dates

- **Letters of Intent (optional):** December 14, 2001
- **Preliminary Proposals (optional):** None
- **Full Proposal Deadline Date(s):** February 21, 2002

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
 - Paul Spyropoulos, Computer Specialist, Mathematical and Physical Sciences, telephone: 703-292-4968, e-mail: cheffl@nsf.gov.

PROPOSAL REVIEW INFORMATION

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

AWARD ADMINISTRATION INFORMATION

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

I. INTRODUCTION

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In FY 1998 and 2000, the National Science Foundation (NSF) Directorate for Mathematical and Physical Sciences and U. S. Department of Energy (DOE) Office of Basic Energy Sciences (BES), sponsored competitions for support of Environmental Molecular Science Institutes (EMSIs) aimed at increasing fundamental understanding of natural processes and processes resulting from human activities in the environment at the molecular level. These institutes were intended to encourage cohesive, interdisciplinary, university-industry-national laboratory group efforts in basic research on fundamental issues that underpin the amelioration of environmental problems caused by societal activities that are energy- and pollution-intensive. Five-year awards have been made to four institutes. This announcement describes a continuation of that program, including procedures for requesting renewal of awards made in FY 1998.

This competition provides an opportunity for funding three to five new and/or renewed Environmental Molecular Science Institutes. Up to \$4.0 million per year from Divisions of Chemistry(MPS)and Earth Sciences(GEO)of NSF will be made available for awards beginning in FY 2002, subject to availability of funds. Additional funds up to \$1.0 million per year may be available from DOE. NSF and DOE are collaborating in this effort in order 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. NSF Program Officers from Divisions Chemistry and Earth Sciences will consult with Program Officers from DOE Division of Chemical Sciences, Geosciences & Biosciences during the review process. Subject to availability of funds, DOE may support a single Institute or specific activities within EMSIs appropriate to the DOE Office of Basic Energy Sciences and the Office of Environmental Management's missions. Resources and costs that would be incurred by DOE national laboratories (facilities, equipment, personnel, etc.) should be discussed with the appropriate DOE program manager prior to submission of a proposal. Proposals for renewal of EMSIs established in FY 1998 will also be considered as part of this competition.

The disciplines of chemistry (including actinide chemistry) and geochemistry, with a focus on the molecular level, play a central role in addressing the needs for fundamental understanding and development of technology in environmental areas. Understanding environmental processes and consequences requires studying natural systems, rather than focusing exclusively on laboratory models. Natural systems and their complexity pose an enormous, perhaps the ultimate, challenge to chemists and geoscientists, and will provide them with varied and exciting new problems for years to come. In addition, the complexity of the underlying systems and processes often requires multi-disciplinary programs that bridge the interfaces between chemistry, the geosciences and other disciplines. This challenge suggests the need for interdisciplinary efforts based in the chemistry and geosciences areas as well as the need for broadening the education and training of future scientists and engineers.

Furthermore, the chemical sciences contribute to solving the major scientific and technological challenges of the 21st century. Quality of life in the United States depends on the environmental impact of the production and use of energy and chemicals. Thus, it is imperative to develop better understanding of the environment and to develop new strategies for minimizing the negative environmental effects of using energy and producing and disposing of chemicals. Recent advances in techniques for the synthesis and characterization of chemicals and materials and for the molecular control of biological organisms make it possible, for the first time, to address this imperative.

Among the topical areas appropriate for this competition are 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 solid earth interfaces; clean sources of energy including nuclear energy and related waste disposal, radiation effects, containment and cleanup; and integrated understanding of the response of a specific environment to chemical perturbations caused by human activities. In order to advance understanding of these areas, research is necessary on topics such as materials synthesis and nanoscience, metalloenzymes and metal chelators, interfacial science, corrosion and separations, catalysis and biocatalysis, alternative solvents, waste treatment, and supporting capabilities and technologies. Collaborative activities are critical to addressing these areas.

II. PROGRAM DESCRIPTION

The Earth's mineral-water-air interfaces, and the molecular-scale processes that occur in them are of critical importance to the quality of the environment, availability of fresh water and clean air, the development of soils and the distribution of plant nutrients, the integrity of underground waste, and the global cycling of the elements.

There are many opportunities for chemists and geoscientists to contribute to our understanding of surfaces and interfaces, and the chemical, physical and biological processes they affect. Research in this area will focus on probing structures and processes at the molecular level and their relevance to the environment.

Areas appropriate for consideration as part of this program include, but are not limited to:

- Understanding 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 the interface between organic and inorganic solids, liquids and gases.
- Understanding the mechanism, dynamics and specificity of the interaction of chemical and biological entities in the environment as a result of intentional or accidental human acts and the development of chemical and biological sensors, that are chemical specific, low cost, robust, and portable for monitoring these entities.

- Understanding the distribution and behavior of molecular-level chemical and biogeochemical structures throughout the ocean and the development and application of chemical and biological sensor technology for making rapid, high precision observations at submicroscopic spatial and volumetric scales.
- Undertaking detailed atomic and molecular studies of mineral surfaces using new surface-sensitive microscopies and spectroscopies in conjunction with ab initio molecular orbital calculations.
- Investigating biological, biochemical, and physiochemical processes at marine interfaces, including sea-air, water-sediment, and organism-environment levels in the ocean, estuarine-coastal waters and hydrothermal environments.

The underlying fundamental benefit from this research includes better understanding of the role of surface phenomena in regulating chemical exchanges (including pollutants) between mineral surfaces and water or air that are known, or suspected, to underlie the functioning of the atmosphere, lithosphere, and ocean as a global biogeochemical system.

Environmental Molecular Science Institutes (EMSI) should serve as national models and resources for excellence in collaborative environmental research and in dissemination of results for the solution or amelioration of environmental problems. To strengthen the probability that the proposed basic research focus will contribute in the future to improve technologies and processes, collaborations with appropriate industries and scientist from 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.

EMSI are intended for larger teams of faculty, scientists from national laboratories and industry (typically six or more), who target either broad areas of importance to the environment and energy or especially complex problems. Proposers are invited to take a fresh look at environmental challenges and to develop activities around a unified theme. EMSI are expected to have substantial education and outreach components in addition to the research. Industrial partnerships and partnerships with Government laboratories are strongly encouraged. Each Institute must have a focused research theme and specific goals; the research should not be a collection of existing projects. The organization and management structure must be designed to meet these goals. Funding up to \$1.5 million per year for five years is appropriate and could include a significant component of instrumentation resources and infrastructure support as part of the operating budget.

Before expiration of the grant, successful EMSI will be eligible to compete for renewal in competition with proposals for new EMSI. The NSF reserves the right to terminate the EMSI program at any time and this could affect renewals. In the fourth year of the award, the Awardee may submit to NSF a renewal proposal provided there is an EMSI competition in that year. NSF will specify the format of the review process and additional criteria for the renewal proposal. If the awardee chooses not to submit a renewal proposal, NSF support to the Institute will be continued according to the terms of the original award.

III. ELIGIBILITY INFORMATION

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

NSF does not normally support technical assistance, pilot plant efforts, research requiring security classification, and the development of products for commercial marketing or market research for a particular project or invention. Research with disease-related goals, including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals, is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support. Research in bioengineering, with diagnosis or treatment related goals, however, that applies engineering principles to problems in biology and medicine while advancing engineering knowledge is eligible for support. Bioengineering research to aid persons with disabilities is also eligible.

No institution may submit more than one proposal to this competition. Proposals already submitted to other NSF programs or other federal agencies are not eligible for consideration in this competition. A Principal Investigator may submit only one proposal to this competition and may only collaborate on one other proposal as a Co-Principal Investigator. When consortia of eligible individuals or institutions submit a proposal, a single principal investigator must be designated as the project director and a single institution must accept overall management responsibility. Collaborations with researchers from industry and/or government laboratories are strongly encouraged. For this program, collaborating scientists associated with entities such as national laboratories, state agencies, and non-NSF Federally Funded Research and Development Centers (FFRDC) must be supported by their own institution. However, it is appropriate for students - undergraduate, graduate and postdoctoral - supported through universities to work at a FFRDC or comparable site, or for universities to fund research expenses incurred when scientists from such entities work at university sites. Federal employees may not receive salaries or in other ways augment their agency's appropriation through grants made by this program, and no funds for major equipment at FFRDCs are allowed.

For foreign participants, the US university may provide funds under participant support costs for travel and per diem for visits to the US institution, as consistent with applicable international agreements. No US funds may go directly to foreign institutions.

Potential applicants are requested to submit a Letter of Intent by e-mail by 5:00 PM local time, December 14, 2001. The letter is described in detail below. It should identify principal investigators, collaborators and format of the activity, and describe the main thrusts of the project. An institutional signature is not required.

Full proposals, prepared in accordance with the Grant Proposal Guide and the instructions below must be received by 5:00 PM local time, February 21, 2002. Additional information on format, budgetary requirements, FastLane submission, and review criteria is provided below. 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 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 announcement, proposals may be submitted for up to five years for any funding amount up to \$1.5 million per year. Grants may be awarded in a variety of sizes and durations. NSF expects to fund approximately 3-5 Institutes, depending on the quality of submissions and the availability of funds. It is anticipated that approximately \$4 million will be available from NSF for this initiative in FY 2002. 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: July 2002.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent: Electronic Letters of Intent (optional) should be sent by e-mail on or before 5:00 PM local time, December 14, 2001, to emsi@nsf.gov. Do not send hard copies. No original signatures are required. The main purpose of the letter is to enable NSF to plan the review process by giving the Foundation an estimate of the number and topical breadth of proposals expected and the institutions involved. The Letters of Intent should be no more than 400 words long (approximately one page of single-spaced text) and should contain the following: (1) title; (2) a general description of the proposal; (3) the identity of the PI, institution and facilities; and (4) the identity of all other investigators, institutions and facilities. An acknowledgement of receipt of the Letter of Intent will be e-mailed by December 28, 2001. Please note these letters are for planning purposes only. Proposal review and funding recommendations will be based on the full proposals.

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

This section, which broadly describes the nature and scope of an institute, may be used in the preparation of the proposal. This is not intended to be prescriptive, and many approaches may be appropriate, including the traditional understanding of an institute at a specific physical location, as well as regional or more widely distributed institutes. Proposals should include information that defines the institute, describes the planning process, defines the mission and goals, describes how the desired goals will be achieved and how it will be determined that these goals have been accomplished. The proposing groups are expected to construct an appropriate organization and structure that will maximize the institute's effectiveness and impact.

The leadership of an institute should be provided by a small group, including a director and, if appropriate to the size of the institute, an associate director. An institute should also have an external advisory committee. The director of an institute should be a respected scientist with demonstrated organizational, managerial, and leadership ability. A committee of scientists from the participating institutions should provide an institute's scientific guidance. Although a multi-institutional consortium may be involved, a single entity must accept overall management responsibility in dealing with NSF.

The NSF Grant Proposal Guide (GPG), NSF 01-2A, describes the format required for proposals. 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 institute, its overall goals, and expected impact (3 pages, maximum);
- Planned scientific activities, including a five-year plan for phasing activities in or out, and the roles of the various partners (15 pages, maximum);
- Plans for human resource development, including involvement of undergraduate, graduate and postdoctoral students and members of under-represented groups (2 pages, maximum);
- Description of planned outreach activities and dissemination (2 pages, maximum);
- Description of goals and outcomes expected and how the impact will be demonstrated and evaluated (2 pages, maximum);
- Description of the organizational structure of the institute, clearly outlining the proposed management structure, mechanisms for focusing institute activities, methods for selecting and integrating research emphases, criteria for selection of participants, allocating funds and equipment, and managing the involvement of other groups (4 pages, maximum).
- Renewal proposals list NSF award number; amount and period of support; title of the Institute; summary of the results of research under the original award; publications resulting from the award; a brief description of available data, samples, physical collections and other related research products not described elsewhere; and a brief description of significant results in education, outreach and involvement of underrepresented groups (5 pages, maximum).

Each biographical sketch, limited to two pages, should include a brief summary of results of prior NSF support. Please note that letters describing collaborative arrangements significant to the proposals should be included in "supplementary documentation." Letters of support or endorsement are not permitted and may result in the proposal being returned without review.

For collaborative activities involving DOE national laboratories, the cost of DOE resources (facilities, equipment, 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. Letters of collaboration including a draft budget for the DOE collaborator should be included as supplementary documentation. "Endorsement" letters may not be included. No appendices are permitted.

Support for collaborations with international scientists is provided through the NSF grant to the submitting U.S. institution, and no NSF funds may go directly 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.

In the organizational unit block on NSF Form 1207, "Chemistry Projects" should be chosen.

Proposers are reminded to identify the program solicitation number (NSF 02-015) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). 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 of a one-to-one match of instrumentation costs in excess of \$80,000 is also required. In-kind contributions may not be used to fulfill this instrumentation match.

The proposed cost sharing must be shown on Line M on the proposal budget. Documentation of the availability of cost sharing must be included in the proposal. Only items which would be allowable under the applicable cost principles, if charged to the project, may be included as the awardee's contribution to cost sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in-kind (see OMB Circular A-110, Section 23). It should be noted that contributions counted as cost-sharing toward projects of another Federal agency may not be counted towards meeting the specific cost-sharing requirements of the NSF award. All cost-sharing amounts are subject to audit. Failure to provide the level of cost-sharing reflected in the approved award budget may result in termination of the NSF award, disallowance of award costs and/or refund of award funds to NSF.

C. Deadline/Target Dates

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

Letters of Intent (optional): December 14, 2001

Full Proposals by 5:00 PM local time: February 21, 2002

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see [Chapter II, Section C](#) of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: <http://www.fastlane.nsf.gov>.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

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

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

What is the intellectual merit of the proposed activity?

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

What are the broader impacts of the proposed activity?

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

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education

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

Integrating Diversity into NSF Programs, Projects, and Activities

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

Additional Review Criteria

In addition to the above generic review criteria, reviewers will be asked to use the following additional general criteria when reviewing these proposals: (1) potential for significant contributions to environmental chemistry, geochemistry and/or actinide chemistry; (2) strength of the collaborations planned; (3) value to education; (4) potential for national leadership among the constituency interested in the research theme; and (5) extent and effectiveness of collaboration with industry and/or national laboratories. Reviewers will also be asked to consider the following additional more specific criteria:

- Quality of the scientific activities and their potential for leadership and impact on environmental chemistry and solutions to environmental problems;
- Extent of interdisciplinarity and the extent to which communication and interaction with other areas of science and engineering are fostered by linkages and partnerships among university research groups, industry, national laboratories, etc.;
- Capabilities of the institute leadership, including managerial and organizational ability of the director and of the proposed leadership team;
- Quality and anticipated effectiveness of the management plan, including plans for interaction among institute staff and institutional partners and for operation of the institute, including selection of activities and participants;
- Quality of the institute's education and training components especially plans to attract, involve and mentor students and under-represented groups;
- Quality and effectiveness of proposed outreach activities and dissemination of results;
- Clarity of mission and goals and quality of the evaluation plan;
- Quality and effectiveness of the commitment to the institute by the lead institution and its partners.

Additional Review Criteria for Renewal Proposals:

In addition to the above criteria for review, renewal proposals will be evaluated on results and quality of the scientific activities and their impact for leadership in environmental chemistry and solutions to environmental problems achieved during the four years of existence of the Institute. Other criteria to be evaluated are: Demonstrated management capabilities and organizational structure of the Institute; Collaborations and extent of interdisciplinary approaches, communications and interactions with other areas of science and engineering carried out by the Institute; Effectiveness of education and programs; Effectiveness in involving participation by members of underrepresented groups; and Outreach and dissemination of results achieved by the Institute.

Collaborative Proposals with National Laboratories:

In addition to the above NSF criteria for review, collaborative proposals will be evaluated for quality and effectiveness of the collaboration with national laboratories in terms of areas of interactions as related to the DOE activities, mission, priorities and long term goals.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement will be reviewed by a combination of panel and ad hoc review.

In addition, site visits to finalists from new proposals in the EMSI competition are anticipated.

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.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions;* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

C. Reporting Requirements

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

For this competition, it is expected that all successful PIs will be required to attend periodic (approximately every two years, during the tenure of the award) meetings of awardees or workshops at dates and places to be specified by NSF. Institutes (EMSI) should plan for a formal site visit by NSF at the midpoint of an award.

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

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

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Environmental Molecular Science Institutes should be made to:

- Dr. Joseph A. Akkara, Program Director, Mathematical and Physical Sciences, Chemistry, 1055, telephone: 703-292-4946, e-mail: jakkara@nsf.gov.
- Dr. David D. Lambert, Program Director, Geological Sciences, Earth Sciences, 785, telephone: 703-292-8558, e-mail: dlambert@nsf.gov.
- Dr. Paul H. Smith, Team Leader (Acting), US Department of Energy, Office of Basic Energy Sciences, telephone: 301-903-5806, e-mail: Paul.H.Smith@science.doe.gov.

For questions related to the use of FastLane, contact:

- Paul Spyropoulos, Computer Specialist, Mathematical and Physical Sciences, telephone: 703-292-4968, e-mail: cheffl@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

OMB control number: 3145-0058.