Engineering Virtual Organization Grants (EVO)

Program Solicitation
NSF 07-558

National Science Foundation

Directorate for Engineering
Electrical, Communications and CyberSystems
Chemical, Bioengineering, Environmental, and Transport Systems
Civil, Mechanical and Manufacturing Innovation
Engineering Education and Centers
Industrial Innovation and Partnerships

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. proposer's local time)***:***

May 31, 2007

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

July 03, 2007

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Engineering Virtual Organization (EVO) Grants

Synopsis of Program:

The primary purpose of this solicitation is to promote the development of Virtual Organizations (VO's) for the engineering community (EVOs). A VO is created by a group of individuals whose members and resources may be dispersed globally, yet who function as a coherent unit through the use of cyberinfrastructure (CI). EVOs will extend beyond small collaborations and individual departments or institutions to encompass wide-ranging, geographically dispersed activities and groups. This approach has the potential to revolutionize the conduct of science and engineering research, education, and innovation. These systems provide shared access to centralized or distributed resources, such as community-specific sets of tools, applications, data, and sensors, and experimental operations, often in real time.

With the access to enabling tools and services, self-organizing communities can create VOs to facilitate scientific workflows; collaborate on experiments; share information and knowledge; remotely operate instrumentation; run numerical simulations using shared computing resources; dynamically acquire, archive, e-publish, access, mine, analyze, and visualize data; develop new computational models; and deliver unique learning, workforce-development, and innovation tools. Most importantly, each VO design can originate within a community and be explicitly tailored to meet the needs of that specific community. At the same time, to exploit the full power of cyberinfrastructure for a VO's needs, research domain experts need to collaborate with CI professionals who have expertise in algorithm development, systems operations, and application development.

This program solicitation requests proposals for two-year seed awards to establish EVOs. Proposals must address the EVO organizing principle, structure, shared community resources, and research and learning goals; a vision for organizing the community, including international partners; a vision for preparing the CI components needed to enable those goals; a plan to obtain and document user requirements formally; and a project management plan for developing both a prototype implementation and a conceptual design of a full

implementation. These items will be used as criteria for evaluation along with the standard NSF criteria of Intellectual Merit and Broader Impacts. Within the award size constraints, the prototype implementation should provide proof of concept with a limited number of its potential CI features. Successful proposals should expect to demonstrate the benefits of a fully functional EVO and how it will catalyze both large and small connections, circumventing the global limitations of geography and time zones.

Cognizant Program Officer(s):

- Phillip Westmoreland, Coordinator; Program Director, ENG/CBET, telephone: (703) 292-8371, email: pwestmor@nsf.gov
- Eduardo Misawa, Coordinator; Program Director, ENG/CMMI, telephone: (703) 292-5353, email: emisawa@nsf.gov
- Maria Burka, Program Director, ENG/CBET, telephone: (703) 292-7030, email: mburka@nsf.gov
- Bruce Hamilton, Program Director, ENG/CBET, telephone: (703) 292-7066, email: bhamilto@nsf.gov
- Deborah Jackson, Program Director, ENG/EEC, telephone: (703) 292-7499, email: djackson@nsf.gov
- Glenn Larsen, Program Director, ENG/IIP, telephone: (703) 292-4607, email: glarsen@nsf.gov
- Scott Midkiff, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: smidkiff@nsf.gov
- Stephen Nash, Program Director, ENG/CMMI, telephone: (703) 292-7902, email: snash@nsf.gov
- Joy Pauschke, Program Director, ENG/CMMI, telephone: (703) 292-7024, email: jpauschk@nsf.gov
- Paul Werbos, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: pwerbos@nsf.gov
- Jeanne Hudson, Program Director, OISE, telephone: (703) 292-7252, email: jhudson@nsf.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 10 to 15

Anticipated Funding Amount: $100,000 to $200,000 per award pending the availability of funds out of a total budget of $2,000,000.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges: Universities and two- and four-year colleges (including community colleges) located and accredited in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

PI Limit:

Principal Investigators must be at the faculty level or equivalent, and the lead PI must have a primary appointment in an engineering department.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

An individual may not be named as a participant on more than one proposal submitted to this solicitation. This limitation includes participation as a PI, other senior personnel, or consultant for whom financial remuneration is requested other than travel expenses. The principal investigator will be the coordinator of the community organization, recognizing that a breadth of other active participants is also necessary in the development of an EVO.

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.
- **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.
  - 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/bfa/dias/policy/docs/grantsgovguide.pdf)

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

- **Letter of Intent Due Date(s) *(required)*** (due by 5 p.m. proposer's local time)*:*

  May 31, 2007

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

  July 03, 2007

Proposal Review Information Criteria

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: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

Cyberinfrastructure (CI) is having a transformative effect on engineering practice, science and education. The National Science Foundation (NSF) has been active in developing CI and advancing its use. Numerous resources are available that describe these activities:

- Report of the NSF Blue-Ribbon Panel on Cyberinfrastructure
- NSF Cyberinfrastructure Council Vision document
- NSF-sponsored workshops, several focused on engineering CI

Among its other investments in CI, NSF has catalyzed the creation of VOs as a key means of aiding access to research resources, thus advancing science and its application. Researchers working at the frontiers of knowledge and innovation increasingly require access to shared, world-class community resources spanning data collections, high-performance computing equipment, advanced simulation tools, sophisticated analysis and visualization facilities, collaborative tools, experimental facilities and field equipment, distributed instrumentation, sensor networks and arrays, mobile research platforms, and digital learning materials. With an end-to-end system, VOs can integrate shared community resources, including international resources, with an interoperable suite of software and middleware services and tools and high-performance networks. This use of CI can then create powerful transformative and broadly accessible pathways for scientific and engineering VOs to accelerate research outcomes into knowledge, products, services, and new learning opportunities.

Initial engineering-focused VOs (EVOs) have demonstrated the potential for this approach. Examples of EVOs involving significant engineering communities are the George E. Brown Jr. Network for Earthquake Engineering Simulation (NEES), the Collaborative Large-scale Engineering Analysis Network for Environmental Research (now called the WATERS network), the National Nanofabrication Users Network, and the Network for Computational Nanotechnology and its nanoHUB.org portal.

Other engineering communities can benefit from extending this model: organizing as VOs; exploiting existing CI tools, rapidly putting them to use; and identifying new CI opportunities, needs, and tools to reach toward their immediate and grand-challenge goals. These activities must be driven by the needs of participating engineers and scientists, but collaboration with information scientists is vital to build in the full power of CI capabilities.

Creation of VOs by engineering communities will revolutionize how their research, technical collaborations, and engineering practices are developed and conducted. EVOs will accelerate both research and education by organizing and aiding shared access to community resources through a mix of governance principles and cyberinfrastructure.

II. PROGRAM DESCRIPTION

This program solicitation requests proposals for two-year seed awards with three key elements: (1) establishing an engineering virtual organization, (2) deploying its prototype EVO implementation, and (3) creating a conceptual design of its full implementation. Proposals are encouraged from engineering communities that can provide documentary evidence of strong community support and interest in developing an EVO enabled by CI, potentially including international participants. The CI conceptual design should draw upon: (1) articulated research and education goals of a research community to advance new frontiers, (2) advances made by other scientific and engineering fields in establishing and operating VOs and their associated CI, (3) commercially available CI tools and services, and (4) CI tools and services emerging from current federal investments.

Proposals must address the following topics:

- EVO structure and justification: Vision and mission; organizing and governing structure; members and recruitment; end users; stakeholders; and shared community resources (e.g., experimental facilities, observatories, data collections), their associated service providers, and access / allocation methods. Identify frontier research and education goals of the EVO, including compelling research questions and the potential for broad participation. EVOs will extend beyond small collaborations and individual departments or institutions to encompass wide-ranging, geographically dispersed activities and groups.

- A plan for obtaining and formally documenting user requirements that will inform the EVO design, e.g., through workshops, surveys, and other means. Integration of research and education must be addressed. User requirements must address community cybersecurity and identify other challenges and barriers to design, development, implementation, management and operations, evaluation and assessment, and long-term sustainability.

- Project management plan for implementation of the EVO's prototype. This plan should include a description of the project team and key individuals, their recent or ongoing involvement in VOs and related CI research and development, an organizational chart, and a project schedule for the two-year project, including its prototype deployment with a limited number of the potential CI features.

- Conceptual design for designing a future full-scale implementation. This design process would identify any CI research and development needed for software tools and components currently not existing to meet user requirements either commercially or in a research-and-development phase (e.g., through federally funded projects). Projects must cite any related and existing CI software tools and components with similar functionality, and make a compelling case for the need for new software development work.

- Plan for disseminating the conceptual design to inform CI investments for other scientific and engineering VOs.

Proposed projects must not:

- Use a substantial fraction of the requested funds for the collection of new data, the development of new numerical models, or the augmentation of existing numerical models.

- Overlap substantially with an existing EVO or CI project or fall within the scope of an existing NSF funding opportunity.

These items will be used as criteria for evaluation along with the standard NSF criteria of Intellectual Merit and Broader Impacts. Proposals not complying with these requirements are subject to return without review.

Given the worldwide expansion of research, education, and innovation, international collaborations are encouraged that advance EVO goals and strengthen proposed project activities. There is an opportunity for coordinated funding with colleagues from foreign institutions who will add value to the project. This program will support only U.S.-based scientists. Collaborators in institutions outside the U.S. must seek funding from their respective funding organizations. International collaborations will be evaluated on the value that they add to the domestic research proposed and to the U.S. S&T enterprise. NSF requires that proposals with international collaborations include the following: description of the collaboration; discussion of U.S. and foreign contributions to the project; costs to travel to and work with foreign partners; foreign collaborators' biographical sketches (CVs); and documentation of their agreement to collaborate on the proposed project, as well as the means by which they will support their part of the work (http://www.nsf.gov/OISE).

III. AWARD INFORMATION

This solicitation requests proposals for two-year seed awards to establish engineering virtual organizations (EVOs). Proposals must address the EVO organizing principle, structure, shared community resources, and research and learning goals; a vision for organizing the community; a vision for preparing the CI components needed to enable those goals; a plan to obtain and document user requirements formally; and a project management plan for developing both a prototype implementation and a conceptual design of a full implementation. Successful proposals should expect to demonstrate the benefits of a fully functional EVO with a prototype, showing how it will catalyze both large and small connections and circumventing the global limitations of geography and time zones. A kick-off workshop will be held at NSF on October 15, 2007, and an annual Grantees Conference / Workshop will be held on or about October 15, 2008, with travel funds for grantees to be budgeted within the proposal. Estimated program budget, number of awards, and average award size are subject to the availability of funds. The NSF Engineering Directorate intends longer-term support for EVOs in the future, pending success of this program and the availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges: Universities and two- and four-year colleges (including community colleges) located and accredited in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

PI Limit:

Principal Investigators must be at the faculty level or equivalent, and the lead PI must have a primary appointment in an engineering department.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

An individual may not be named as a participant on more than one proposal submitted to this solicitation. This limitation includes participation as a PI, other senior personnel, or consultant for whom financial remuneration is requested other than travel expenses. The principal investigator will be the coordinator of the community organization, recognizing that a breadth of other active participants is also necessary in the development of an EVO.

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(required)*:A Letter of Intent (LOI) is required in advance of submission of a full proposal to enable earlier selection and better management of reviewers. It shall contain the PI's and co-PI's names, a proposed title, a list of proposed virtual-organization participants, and a synopsis that describes the work in sufficient detail to permit an appropriate selection of reviewers. The LOI must be submitted electronically via the NSF FastLane System. [See Proposal and Award Manual, Chapter III.A., for more information.]

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 0 and Maximum of 4 Other Senior Project Personnel are allowed
- Submission of multiple Letters of Intent is not allowed

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. 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. 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/bfa/dias/policy/docs/grantsgovguide.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.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

B. Budgetary Information

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

C. Due Dates

- **Letter of Intent Due Date(s) *(required)*** (due by 5 p.m. proposer's local time)***:***

  May 31, 2007

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

D. FastLane / Grants.gov Requirements

- **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. 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. 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

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

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:

Refer to Section II, Program Description, for specific information about additional review criteria.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by 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.

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.

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 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.)

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 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 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 http://www.nsf.gov/awards/managing/general_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.

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.

C. Reporting Requirements

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

General inquiries regarding this program should be made to:

- Phillip Westmoreland, Coordinator; Program Director, ENG/CBET, telephone: (703) 292-8371, email: pwestmor@nsf.gov
- Eduardo Misawa, Coordinator; Program Director, ENG/CMMI, telephone: (703) 292-5353, email: emisawa@nsf.gov
- Maria Burka, Program Director, ENG/CBET, telephone: (703) 292-7030, email: mburka@nsf.gov

- Bruce Hamilton, Program Director, ENG/CBET, telephone: (703) 292-7066, email: bhamilto@nsf.gov
- Deborah Jackson, Program Director, ENG/EEC, telephone: (703) 292-7499, email: djackson@nsf.gov
- Glenn Larsen, Program Director, ENG/IIP, telephone: (703) 292-4607, email: glarsen@nsf.gov
- Scott Midkiff, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: smidkiff@nsf.gov
- Stephen Nash, Program Director, ENG/CMMI, telephone: (703) 292-7902, email: snash@nsf.gov
- Joy Pauschke, Program Director, ENG/CMMI, telephone: (703) 292-7024, email: jpauschk@nsf.gov
- Paul Werbos, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: pwerbos@nsf.gov
- Jeanne Hudson, Program Director, OISE, telephone: (703) 292-7252, email: jhudson@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: 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.

IX. OTHER INFORMATION

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, MyNSF (formerly the Custom News Service) is an information-delivery system 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 or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at http://www.nsf.gov/mynsf/.

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

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.

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