Cyberlearning and Future Learning Technologies (Cyberlearning)

PROGRAM SOLICITATION
NSF 17-520

REPLACES DOCUMENT(S):
NSF 14-526

National Science Foundation

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

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

February 10, 2017

IMPORTANT INFORMATION AND REVISION NOTES

This solicitation calls for proposals to only one proposal category, Exploration (EXP).

Proposals in the following categories may no longer be submitted to this program:

- Integration (INT);
- Development and Implementation Projects (DIP); and
- Capacity Building Projects (CAP).

Additionally, a Cyberlearning proposal may no longer be submitted to the Faculty Early-Career Development (CAREER) or CISE Research Initiation Initiative (CRII) programs.

Letters of Intent and Target Deadlines no longer apply to this solicitation.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 17-1), which is effective for proposals submitted, or due, on or after January 30, 2017. Please be advised that proposers who opt to submit prior to January 30, 2017, must also follow the guidelines contained in NSF 17-1.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Cyberlearning and Future Learning Technologies

Synopsis of Program:

The purpose of the *Cyberlearning and Future Learning Technologies* program is to integrate opportunities offered by emerging technologies with advances in what is known about how people learn to advance three interconnected thrusts:

- **Cyber innovation**: Developing next-generation cyberlearning approaches through high-risk, high-reward advances in computer and information science and engineering;

- **Learning innovation**: Inventing and improving next-generation genres (types) of learning technologies, identifying new means of using technology for fostering and assessing learning, and proposing new ways of integrating learning technologies with each other and into learning environments to foster and assess learning; and

- **Advancing understanding of how people learn in technology-rich learning environments**: Enhancing understanding of how people learn and how to better foster and assess learning, especially in technology-rich learning environments that offer new opportunities for learning and through data collection and computational modeling of learners and groups of learners that can be done only in such environments.

The intention of this program is to advance technologies that specifically focus on the experiences of learners; innovations that simply focus on making teaching easier will not be funded. Proposals that focus on teachers or

facilitators as learners are invited; the aim in these proposals should be to help teachers and facilitators capitalize on the affordances of technology and fundamental knowledge about how people learn to make the learning experiences of learners more effective.

Proposals are expected to address all three of the program's thrusts. Of particular interest are technological advances that (1) foster deep understanding of content coordinated with masterful learning of practices and skills; (2) draw in and encourage learning among populations not served well by current educational practices; and/or (3) provide new ways of assessing understanding, engagement, and capabilities of learners. It is expected that research funded by this program will shed light on how technology can enable new forms of educational practice. This program does not support proposals that aim simply to implement and evaluate a particular software application or technology in support of a specific course.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Tatiana Korelsky, co-lead, CISE/IIS, 1125, telephone: (703) 292-8930, email: tkorelsk@nsf.gov

- Amy L. Baylor, co-lead EHR, EHR/DRL, 890, telephone: (703) 292-5126, email: abaylor@nsf.gov

- William Bainbridge, Program Officer, CISE/IIS, 1125, telephone: (703)292-7470, email: wbainbri@nsf.gov

- Kamau Bobb, Program Officer, CISE/CNS, 1175, telephone: (703) 292-4291, email: kbobb@nsf.gov

- John Cherniavsky, Program Officer, EHR/DRL, 855, telephone: (703)292-5136, email: jchernia@nsf.gov

- Elliot Douglas, Program Officer, ENG/EEC, 585, telephone: (703) 292-7051, email: edouglas@nsf.gov

- Kevin Lee, Program Officer, EHR/DUE, 840, telephone: (703) 292-4639, email: kelee@nsf.gov

- Sushil K. Prasad, Program Officer, CISE/ACI, 1270, telephone: (703) 292-5059, email: sprasad@nsf.gov

- Robert Russell, Program Officer, EHR/DRL, 885, telephone: (703) 292-2995, email: rlrussel@nsf.gov

- Chia Shen, Program Officer, EHR/DRL, 855, telephone: (703)292-8447, email: cshen@naf.gov

- Maria Zemankova, Program Officer, CISE/IIS, 1125, telephone: (703) 292-7348, email: mzemanko@nsf.gov

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

- 47.041 --- Engineering
- 47.070 --- Computer and Information Science and Engineering
- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 12

Contingent upon availability of funds.

Anticipated Funding Amount: $6,000,000

Each EXP Project will be funded for a duration of 2 to 3 years and up to a total funding amount of $550,000. With appropriate justification, some EXP projects may be funded for up to $750,000. Proposers should receive permission from a program officer before submitting a budget larger than $550,000.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 2

An individual may participate as PI or co-PI in **no more than a total of two (2)** proposals in response to this solicitation. In the event that an individual exceeds the limit for this solicitation, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e. the first two proposals received will be accepted and the remainder will be returned without review). **No exceptions will be made.**

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required

- **Preliminary Proposal Submission:** Not required

- **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/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:**

    Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:**

    Not Applicable

- **Other Budgetary Limitations:**

    Not Applicable

C. Due Dates

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

    February 10, 2017

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:

Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements:

Standard NSF reporting requirements apply.

TABLE OF CONTENTS

IX. Other Information

I. INTRODUCTION

The purpose of the **Cyberlearning and Future Learning Technologies (Cyberlearning)** program is to integrate opportunities offered by emerging technologies with advances in what is known about how people learn to further design of the next generation of learning technologies and increase understanding of how people learn in technology-rich learning environments.

The program's purpose derives from a multi-part vision:

- New and emerging technologies have the potential to expand and transform learning opportunities, learning interests, and learning outcomes in all phases of life, making it possible for learning opportunities to be tailored to the interests, needs, and resources of individual learners and groups of learners. This includes populations who are not reached well by current educational resources (nationally and worldwide).
- The best technological genres and socio-technical systems designed for these purposes will be informed by what is known about how people learn, how to foster learning, and the design and implementation of environments for productive learning.
- With these systems in place, the opportunity exists to make significant progress in formulating a cutting-edge understanding of learning that aims towards predictive computational models of individual and group learning in real-world learning environments.

The program has two goals: (1) to invent, explore, and learn to effectively use the new technologies that will address society's educational goals; and (2) to advance understanding of how people learn and how to better foster learning in the context of the new kinds of learning experiences that technology makes possible.

To achieve these goals, NSF invites proposals that integrate advances in what is known about how people learn with the opportunities offered by emerging technologies to address three interconnected thrusts:

- **Cyber innovation**: Developing next-generation cyberlearning approaches through high-risk, high-reward advances in computer and information science and engineering;

- **Learning innovation**: Inventing and improving next-generation genres (types) of learning technologies, identifying new means of using technology for fostering and assessing learning, and proposing new ways of integrating learning technologies with each other and into learning environments to foster and assess learning; and

- **Advancing understanding of how people learn in technology-rich learning environments**: Enhancing understanding of how people learn and how to better foster and assess learning, especially in technology-rich learning environments that offer new opportunities for learning and through data collection and computational modeling of learners and groups of learners that can be done only in such environments.

II. PROGRAM DESCRIPTION

The answers to several critical and timely questions that have arisen from previously-funded NSF projects and programs will enable new designs and uses of technology for fostering and assessing learning. Projects that help answer one or more of these sets of questions are encouraged:

- *What new technology and socio-technical models are needed to capitalize on the interests and leverage the cognitive, cultural, social, language and developmental resources of different learners and populations of learners so as to draw in learners who might not be reached without those innovations, and help all learners learn more deeply than they would otherwise?*
- *What new technology and socio-technical models are needed to help learners develop new interests, deepen their understanding of complicated concepts and phenomena, and foster their learning of complex practices and skills?*
- *What new technology and socio-technical models are needed so that the big data generated by scientists and engineers can be made available and accessible to learners at all levels in ways that will engage them and help them learn? Under what conditions do these approaches work and why?*
- *What new technology and socio-technical models for blended and online education are needed to foster deep understanding and masterful capabilities? How and under what conditions can these new models be effectively executed, and what makes them work?*
- *What new models for educating will emerge from integrating learning technologies with each other or incorporating them into the lives of learners, communities, or organizations? What new technological models and platforms are needed to support such new models? Under what conditions do these new models work well and why?*
- *What data need to be collected, how can they be collected, and how should they be analyzed to assess, foster, and understand learning? How can such analysis and the models that come from these analyses be used to tailor learning experiences and to inform learners, educators and educational institutions?*

The technological focus of the Cyberlearning program is on *design and exploration of new types, or "genres," of learning technologies* that can be used to achieve the ambitious goals referred to in the questions. A "technological genre" is *a type or category of* learning technology or a new type of configuration of learning technologies rather than a particular application or tool. The "socio-technical" systems of interest are the combination of social and technological infrastructures and environments that support learning and assessment. Other NSF programs (e.g., Discovery Research PreK-12 (DRK-12), Advancing Informal STEM Learning (AISL)) support design of resources, tools, and models for learning particular content and skills; the Cyberlearning program funds projects that imagine the new types of technological resources, tools, and models that might be used to foster and assess learning as emerging technologies become more available and capable.

Proposed new genres may be designed for formal or informal learning environments and may represent new technologies, new ways of using technology, or new types of socio-technical systems. The resources, tools, and models developed as part of Cyberlearning projects should serve as exemplars from which more broadly applicable and transferable knowledge about design and use of learning technologies can be extracted.

4

It is expected that the proposed novel technologies will advance the state of the art in computer and information science and engineering as well as social and behavioral sciences. At the same time, it is expected that research and development plans will draw on the most up-to-date scholarly literature on how people learn and the uses of technology to foster learning. "How people learn" refers to cognitive, neurobiological, behavioral, cultural, social, volitional, epistemological, developmental and other processes involved in individual learning, the processes by which communities increase their understanding and capabilities, and influences on those processes. "Fostering learning" refers to providing whatever help learners need to advance their understanding and capabilities. This might include helping learners better understand difficult concepts and become masterful at skills; recognize when that understanding and those skills are applicable and knowing how to use them; become interested in learning particular content and skills; become excited about learning; make connections between what they are learning and the world in which they life; and identify their interests. "Assessing learning" is also broadly defined, meaning interpretation of what learners understand, are capable of, and are feeling, among other things. Some assessment might be done automatically by technology, while other assessment will require technology and people to work together. Assessment might be done by computers along with teachers or mentors, or it might be done by computers along with learners themselves or groups of learners. The results of assessment are useful only to the extent that they are presented well to those who need to use those results, and designing new ways of helping teachers and learners interpret assessment results is included in the ambitious goals of this program.

Proposed technological innovations should focus primarily on the experiences of learners; innovations that simply focus on making teaching easier will not be funded. Proposals that focus on teachers or facilitators as learners are invited; the aim in these proposals should be to help teachers and facilitators learn to make the learning experiences of learners more effective.

This revision of the *Cyberlearning and Future Learning Technologies* solicits research in the Exploration (EXP) category. The purpose of an EXP project is to try out new ideas, especially risky ones, and explore issues associated with fostering or assessing learning in the context of the proposed innovation.

PROPOSAL REQUIREMENTS:

Every proposal is expected to address all three of the program's thrusts: technology innovation, learning innovation, and advancing understanding of learning in technology-rich learning environments. While the three thrusts are listed separately, it is important to note that they are highly interconnected, and *it is expected that these three parts of every proposal will be interconnected*. Technological innovations, for example, are expected to address some important societal challenge or take advantage of some forward-looking technology opportunity, be informed by what is known about how people learn, and be aimed at strengthening and improving our understanding of how learning happens or how to foster learning or encourage and sustain engagement. Similarly, research activities in support of advancing understanding of learning and promoting generalizability and transferability of new types of learning technologies may be highly interconnected.

While it is essential that proposed innovations have the potential to improve significantly on the *status quo*, proposals do not have to address any particular content, populations, or learning environments. There are no requirements for coverage of any particular content or skills, though support of learning in areas supported by NSF is encouraged. Learners may be of any age, and targeted learning environments may be formal or informal, traditional or non-traditional, collaborative or individual, or may combine or bridge several different types of learning venues.

The following sections provide general and specific requirements for EXP proposals. The *Methodology* subsection includes advice about incorporating suggestions from the joint NSF/Department of Education publication *Common Guidelines for Education Research and Development*. Section V.A, *Proposal Preparation Instructions*, includes more specific information about organizing proposals and what to include in each section.

The Three Interconnected Thrusts

1. Cyber innovation and 2. Learning innovation

The proposed innovation may be *technological,* advancing some new or emerging genre (type) of learning technology or exploring new ways of using technologies for learning or assessment, or coherently integrating such technologies with each other; or it may be *socio-technical*, representing a new or emerging type of technologically-rich learning environment.

Proposed innovations should be informed by the substantial literatures in computer and information science and engineering and on how people learn, how to foster deep learning, and the uses of extant technology in fostering learning.

Proposed projects should produce a "minimally viable product" that will allow PIs to understand how to design and use the new type of innovation, answer research questions, and extract guidelines on scalability and transferability.

Note that incremental advances in existing technologies **will not** be funded through this program; rather, proposals must aim to lay the foundations for designing or refining new and emerging genres of learning technologies. As stated earlier, the intention of this program is to advance technologies that specifically focus on the experiences of learners. Innovations that *simply* focus on making teaching easier will not be funded, but projects that focus on helping teachers or facilitators learn to make learning more effective and engaging for the learners with whom they work are appropriate for this program.

3. Advancing understanding of how people learn in technology-rich learning environments

It is expected that each proposal will include an explicit set of foundational research questions that, when answered, will advance understanding of processes involved in learning (e.g., neurobiological, behavioral, cognitive, cultural, social, epistemological, and/or developmental) and/or how to foster or assess learning, along with a plan for answering or exploring the answers to these questions. *In general, these will be research questions that can only be answered in the context of use of the new type of technology or learning environment.* Questions may be about development of understanding or capabilities, processes involved in learning, influences on learning, how to foster learning, or how to assess learning. Note that these questions are distinct from evaluation questions. Foundational research questions should be explanatory, uncovering why, how, to what extent, or under what circumstances phenomena occur. Their answers should contribute new understandings that endure beyond the proposed implementation.

No particular methodologies are required for answering research questions; rather research methodology and data collection should be chosen to answer the important questions PIs are seeking to answer.

Methodology:

The National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education have released a collaborative publication, *Common Guidelines for Education Research and Development*. The *Guidelines* describe six types of research studies that can generate evidence about how to increase student learning. Research types include those that generate the most fundamental understandings related to education and learning; examinations of associations between variables; iterative design and testing of strategies or interventions; and assessments of the impact of a fully-developed intervention on an education outcome.

For each research type, there is a description of the purpose and the expected empirical and/or theoretical justifications, types of project outcomes, and quality of evidence.

The *Guidelines* publication can be found on the NSF website (NSF 13-126; http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf? WT.mc_id=USNSF_124). A set of FAQs regarding the *Guidelines* are available (NSF 13-127; http://www.nsf.gov/pubs/2013/nsf13127/nsf13127.pdf). Grant proposal writers and PIs are encouraged to familiarize themselves with both documents and use the information therein to help in the preparation of their Cyberlearning proposals.

Project teams and advisory boards:

It is expected that all proposal teams will include appropriate interdisciplinary expertise. The project team (including PIs, senior personnel and supporting investigators, post-docs, advisory board members, and others) should be appropriate for addressing proposed technical and research goals. Expertise in any area may exist in a single person or among the set of people working together, including PIs or advisory board members.

Advisory boards are required and should include two types of advisors, some who complement the expertise of PIs and senior personnel and provide advice about design, implementation, and analysis; and some who have enough distance from the project to contribute to critical review.

Each project team should include expertise in how people learn and the targeted content, technology learners, and practices of educating in the targeted learning environment. It is especially important that each team have at least one key participant who is expert at design of learning experiences or several key participants whose complementary expertise supports sophisticated design of learning experiences.

Every Cyberlearning proposal requires a Collaboration and Management Plan, included as a *Supplementary Document*. The plan may be up to 3 pages long and should be used to articulate the roles of all team members, why the proposed team is an appropriate one, the expertise each team member brings, how the team will work together, and how the integrated contributions of the members of the proposal team are greater than the sum of the contributions of each individual member of the team. *Proposal Preparation Instructions* in Section V.A has more detail on the specific requirements of the Collaboration and Management Plan.

EXPLORATION PROJECTS (EXP)

This solicitation funds projects in the Exploration (EXP) category.

Exploration Projects (EXP projects) explore the proof-of-concept or feasibility of a novel or innovative technology and use of such technology for assessment or to promote learning; EXP projects are particularly suited to trying out new ideas, especially risky ones.

- *Prerequisites:* A team with a shared vision that takes into account what is known about how people learn, learning in the targeted domain, and the use of the technology for such learning, and what is already known about effective use of the particular technologies being proposed as well as the challenges to technology effectiveness is required.
- *Cyber and Learning innovation*: The "minimally viable product" should be sufficient for exploring the feasibility of technology and its role in the new genre and identifying challenges to its effective use. EXP projects should explore, at a minimum, the usability of the technology, the ways learners are (effectively or not effectively) using it for learning or assessment, pathways toward engaging learners in sustained use, and challenges to effective use.
- *Advancing understanding of learning in technology-rich learning environments*: EXP projects should aim to *shed light* on the answers to foundational questions related to learning, learning with technology, linking learning and assessment, and/or learning in technology-rich environments or point the way towards focused fundamental research questions that can be addressed in the context of the proposed new genre.
- *Promoting broad use and transferability of the new genre*: EXP projects should focus on the affordances (opportunities offered) of the proposed innovation for fostering learning or automating assessment and challenges or barriers to its effective use. It is important to study the use of the innovation *in situ*, i.e., to get close to the learners and their interactions with the technology, in order to address these issues. Guidelines for effective design or use may or may not be extracted from EXP studies.
- *Methodology*: It is **not** expected that EXP projects will include summative evaluations or comparative studies. However, proposals must describe expected results and associated success measures.
- *Project team:* Project teams should include, at a minimum, the expertise needed to successfully carry out the design and iterative refinement of the technology, identification of affordances and challenges to effective use of the new technology, and research that will shed light on answers to proposed research questions. The advisory board may also include people whose expertise will be needed in later phases of research and development.
- *Duration and funding*: 2 to 3 years and up to a total of $550,000. With appropriate justification, some EXP projects may be funded for up to $750,000. **Proposers should receive permission from a program officer before submitting a budget larger than $550,000.**

COOPERATION WITH THE CYBERLEARNING RESOURCE CENTER

CIRCL (the Center for Innovative Research in Cyberlearning; http://circlcenter.org) provides capacity-building aid to NSF's cyberlearning-related programs. CIRCL helps PIs collaborate to synthesize findings across NSF's cyberlearning portfolio, fosters national awareness of research contributions from NSF's cyberlearning portfolio, and helps build NSF's cyberlearning community through summits, envisioning and synthesis meetings, research-to-practice meetings, special interest meetings, and matchmaking facilitation. All *Cyberlearning and Future Learning Technologies* projects are required to share their findings with CIRCL, to participate in at least some of the meetings and in synthesis activities, and to be responsive to requests for information from other cyberlearning PIs and from CIRCL.

III. AWARD INFORMATION

Approximately $6 million is anticipated to fund EXP proposals for durations of 2 to 3 years and up to a total funding amount of $550,000 per EXP project. Some EXP projects may be funded for up to $750,000 with approval from a cognizant program officer (see Section VIII) before submission.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

> The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

> There are no restrictions or limits.

Limit on Number of Proposals per Organization:

> There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 2

> An individual may participate as PI or co-PI in **no more than a total of two (2)** proposals in response to this solicitation. In the event that an individual exceeds the limit for this solicitation, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e. the first two proposals received will be accepted and the remainder will be returned without review). **No exceptions will be made.**

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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 nsfpubs@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/publications/pub_summ.jsp?ods_key=grantsgovguide). 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 nsfpubs@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.5 of the Grant Proposal Guide provides additional information on collaborative proposals.

See Chapter II.C.2 of the GPG for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

The following information SUPPLEMENTS (does not replace) the guidelines provided in the NSF PAPPG and the NSF Grants.gov Application Guide.

Proposal Titles: Proposal titles must begin with "EXP" followed by a colon, and then the title of the proposed project. If you submit a proposal as one in a set of collaborative proposals, "EXP" should be followed by a colon, then "Collaborative Research" followed by a colon, and then the project title. For example, if you are submitting a collaborative project, the title of each associated proposal would be "EXP: Collaborative Research: Project Title."

Project Description: Project Descriptions should include the following:

1. Vision and goals.

The proposal should clearly state the societal need or opportunity, its importance, along with investigators' big-picture vision of addressing that need through the proposed project. The vision should be justified by the relevant theories or learning and technological possibilities on which it is based. The proposal should present an overview of the proposed innovation and its role in the proposed vision, along with the research questions that will be addressed in the context of the proposed innovation and the issues of generalizability and transferability that will be addressed.

2. The innovation.

Proposals should describe and justify the new or emerging technological genre or type of socio-technical system, describe the representative implementation that will be developed, and justify its appropriateness as a representative of the genre that will be generalizable to other implementations and serve as a venue for answering foundational research questions.

Proposals should make clear the initial proposed design of their innovation; the theories, literature, prior work, and practical issues

that inform its design; how it will be integrated into the learning environment; the expected experience of learners and learning outcomes; and the means by which learning is expected to happen. Up to five extra screen shots or graphics are allowed in supplementary documentation to make the imagined experiences of learners clear to readers; PIs are encouraged to include such screen shots and to refer to these screen shots in the proposal text.

The plan for iterative refinement should be described, including the data that will be collected and analyzed in support of formative evaluation. Proposals should make clear how iterative refinements will be focused, the literature that informs that focus, and the ways the results from formative analyses will feed back into refinements of the innovation. The methodology for assessing effectiveness of the innovation (design, measures, data collection and analysis) should be described and justified. Measurement may be qualitative or quantitative, as appropriate to the targeted outcome goals and maturity of the innovation.

3. Advancing understanding of learning in technology-rich learning environments.

This section should include appropriate references to the literature, the foundational research questions, and a comprehensive research plan to answer them, including detailed articulation of the research design, measures, data collection, and analysis methods. It is important to distinguish between what is already known and what will be added to the literature.

4. Promoting generalizability and transferability of the new genre.

Each proposal should identify (i) the practical issues that must be addressed in designing the new genre and what makes the proposed implementation ideal for addressing those issues, and conversely, where it falls short in achieving those goals and (ii) the lessons or types of lessons the PI team expects to be able to extract from the iterative development of the innovation and the experiences of learners interacting with it. The importance of addressing the generalizability and transferability issues and plan to address those issues should be provided, justified by appropriate references to the literature on learning with technology. The plan should include detailed description of the data to be collected during iterations in technology development and how those data will be analyzed to extract lessons or guidelines that will be useful to others aiming to use or extend the genre.

5. Prior support

Only prior support directly related to the proposed activities should be included. This section may be placed wherever it best fits within the narrative of the Project Description.

6. Broader impacts

Per the PAPPG, the Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts." This section should provide a discussion of the broader impacts of the proposed activities. This section may be included wherever it best fits within the narrative of the Project Description.

7. Dissemination

The proposal should include a creative communication strategy for reaching the set of audiences who will need to learn about the project's findings, including, where appropriate, scholars, practitioners, entrepreneurs, policy makers, and public audiences. While the potential results of the proposed research are expected to be of sufficient significance to merit peer-reviewed and broader publication, approaches that reach broader audiences are strongly encouraged. Proposals should identify the key elements of a communication plan, e.g., target audiences and identification of the channels/media/technologies appropriate for reaching specific audiences.

Special Information/Supplementary Documentation: *The following supplementary documents **are required** and should be* uploaded into the Supplementary Documentation Section. **No other supplementary materials are allowed.**

(1) List of Project Personnel and Partner Institutions (Note - In collaborative proposals, only the lead institution should provide this information): Provide current, accurate information for **all personnel and institutions involved in the project.** NSF staff will use this information in the merit review process to manage conflicts of interest. The list should include all PIs, Co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Sub awardees, Postdocs, and project-level advisory committee members. This list should be numbered, in alphabetical order by last name, and include for each entry (in this order) Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line. For example:

1. Mary Adams; XYZ University; PI
2. John Brown; University of PQR; Senior Personnel
3. Jane Green; XYZ University; Postdoc
4. Bob Jones; ABC Inc.; Paid Consultant
5. Tim White; ZZZ University; Subawardee

(2) Documentation of Collaborative Arrangements of Significance to the Proposal through Letters of Collaboration: There are two types of collaboration, one involving individuals/organizations that are included in the budget, and the other involving individuals/organizations that are not included in the budget. Collaborations that are included in the budget should be described in the Project Description. Any substantial collaboration with individuals/organizations not included in the budget should be described in the Facilities, Equipment and Other Resources section of the proposal (see PAPPG Chapter II.C.2.i). In either case, whether or not the collaborator is included in the budget, a letter of collaboration from each named participating organization other than the submitting lead, non-lead, and/or subawardee institutions must be provided at the time of submission of the proposal. Such letters simply confirm the commitment to collaborate, as illustrated in the recommended format provided in the PAPPG. They must explicitly state the nature of the collaboration, appear on the organization's letterhead and be signed by the appropriate organizational representative. These letters must not otherwise deviate from the restrictions and requirements set forth in PAPPG Chapter II.C.2.j.

Please note that letters of support may not be submitted. Such letters do not document collaborative arrangements of significance to the project, but primarily convey a sense of enthusiasm for the project and/or highlight the qualifications of the PI or co-PI. Reviewers will be instructed not to consider these letters of support in reviewing the merits of the proposal.

(3) Diagrams and/or screen shots: Up to five (5) diagrams or screen shots that will help readers grasp the envisioned experiences of learners interacting with the proposed technological innovation may be submitted. Short captions that name the diagram or screen shot and point to its essential elements are allowed; **additional textual material is not allowed with the diagrams**.

(4) Collaboration and Management Plan: A Collaboration and Management Plan is required for all *Cyberlearning and Future Learning Technologies* proposals. **Proposals missing a Collaboration and Management Plan will be returned without review.** Up to 3 pages are allowed for this plan. The plan should include all of the following:

1. the collaborators, their expertise, and the specific roles of each in the proposed project; including specifics about how expertise required for the project is distributed across the team;

2. how the project will be managed across all the investigators, institutions, and/or disciplines and across the active personnel and the advisory board;

3. specific coordination mechanisms that will enable cross-investigator, cross-institution, and/or cross-discipline scientific integration (e.g., yearly workshops, graduate student exchange, project meetings at conferences, use of videoconferencing resources or social media technologies, software repositories, etc.); and

4. references to budget line items that support collaboration and coordination mechanisms.

5. *Postdoctoral Researcher Mentoring Plan:* Proposals that include funding to support postdoctoral researchers must include a Postdoctoral Researcher Mentoring Plan as supplementary documentation. See Chapter II.C.2.j of the PAPPG for further information about the implementation of this requirement. **Per the GPG, proposals that require this plan and do not include it will be returned without review.**

6. *Data Management Plan:* All proposals must include a Data Management Plan or assert the absence of the need for such a plan. A Data Management plan specifies the procedures you will use for keeping, storing, and sharing ***data*** with other researchers. Data Management Plans should also include the method for making the data anonymous. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. See Chapter II.C.2.j of the PAPPG for further information about the implementation of this requirement. For specific guidance on Data Management Plans submitted to the CISE and EHR directorates, see https://www.nsf.gov/cise/cise_dmp.jsp and https://www.nsf.gov/bfa/dias/policy/dmpdocs/ehr.pdf, respectively.

Single Copy Documents:

Collaborators and Other Affiliations Information: In lieu of the instructions specified in the PAPPG, Collaborators and Other Affiliations Information should be submitted as follows.

For this solicitation, the *Collaborators & Other Affiliations* information specified in the PAPPG should be submitted using the spreadsheet template found at https://www.nsf.gov/cise/collab. For each proposal, a completed spreadsheet for each PI, co-PI, or senior personnel must be uploaded directly into Fastlane in .xls or .xlsx format as a "Collaborator and Other Affiliations" Single Copy Document. NSF staff use this information in the merit review process to help manage reviewer selection; the spreadsheet will ensure the Collaborator and Other Affiliations information has a common, searchable format.

Note the distinction to (1) above for Supplementary Documentation: the listing of all project participants is collected by the project lead and entered as a Supplementary Document, which is then automatically included with all proposals in a project. The Collaborators and Other Affiliations are entered for each participant within each proposal and, as Single Copy Documents, are available only to NSF staff. Collaborators and Other Affiliations due to participants listed on (1) who are not PIs, co-PIs, or senior personnel can be uploaded under Additional Single Copy Documents using Transfer File.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

Budgets must include funding for the PI to attend a two-day PI meeting every year during the lifetime of the award in the Washington, DC, area.

C. Due Dates

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

    February 10, 2017

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

To prepare and submit a proposal via FastLane, see detailed technical instructions 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.

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. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www.grants.gov/web/grants/applicants.html. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical 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.

Proposers that submitted via FastLane are strongly encouraged to use FastLane to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. 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 either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with 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. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://www.nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances,

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

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (GPG Chapter II.C.2.d.i. contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including GPG Chapter II.C.2.d.i., prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
    b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

All proposals will be evaluated according to the following additional criteria:

- The proposed technological innovation, the research questions to be addressed, and the plans for research and development will **all** be evaluated for intellectual merit and potential broader impacts;
- The degree to which the Collaboration and Management Plan adequately demonstrates that participating investigators and advisors will work synergistically to accomplish the program objectives; and
- The extent to which the project scope justifies the level of investment requested.

B. Review and Selection Process

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

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer and/or panel. 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 strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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. After an administrative review has occurred, Grants and Agreements Officers perform 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.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, 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.

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 notice, 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 notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. 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/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@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.

Special Award Conditions:

Each *Cyberlearning and Future Learning Technologies* project is required to have and make use of an advisory board with two types of advisors: participants who complement the expertise of the PIs and senior personnel and can provide advice about design, implementation, and analysis; and participants who have enough distance from the project to contribute to critical review. Advisory board reviews should be included in Annual and Final Reports.

CIRCL (the Center for Innovative Research in Cyberlearning; http://circlcenter.org) provides capacity-building aid to NSF's cyberlearning-related programs. All *Cyberlearning and Future Learning Technologies* projects are required to share their findings with CIRCL, to participate in at least some CIRCL-sponsored meetings and in synthesis activities, and to be responsive to requests for information from other cyberlearning PIs and from CIRCL.

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 no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. 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 Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements 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.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Tatiana Korelsky, co-lead, CISE/IIS, 1125, telephone: (703) 292-8930, email: tkorelsk@nsf.gov

- Amy L. Baylor, co-lead EHR, EHR/DRL, 890, telephone: (703) 292-5126, email: abaylor@nsf.gov

- William Bainbridge, Program Officer, CISE/IIS, 1125, telephone: (703)292-7470, email: wbainbri@nsf.gov

- Kamau Bobb, Program Officer, CISE/CNS, 1175, telephone: (703) 292-4291, email: kbobb@nsf.gov

- John Cherniavsky, Program Officer, EHR/DRL, 855, telephone: (703)292-5136, email: jchernia@nsf.gov

- Elliot Douglas, Program Officer, ENG/EEC, 585, telephone: (703) 292-7051, email: edouglas@nsf.gov

- Kevin Lee, Program Officer, EHR/DUE, 840, telephone: (703) 292-4639, email: kelee@nsf.gov

- Sushil K. Prasad, Program Officer, CISE/ACI, 1270, telephone: (703) 292-5059, email: sprasad@nsf.gov

- Robert Russell, Program Officer, EHR/DRL, 885, telephone: (703) 292-2995, email: rlrussel@nsf.gov

- Chia Shen, Program Officer, EHR/DRL, 855, telephone: (703)292-8447, email: cshen@naf.gov

- Maria Zemankova, Program Officer, CISE/IIS, 1125, telephone: (703) 292-7348, email: mzemanko@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, "NSF Update" 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 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. "NSF Update" also is available on NSF's website.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this 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.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

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

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

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

> The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.
>
> To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov
>
> - **Location:**   4201 Wilson Blvd. Arlington, VA 22230
>
> - **For General Information**   (703) 292-5111
>   (NSF Information Center)**:**
>
> - **TDD (for the hearing-impaired):**   (703) 292-5090
>
> - **To Order Publications or Forms:**

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

| Policies and Important Links | | Privacy | | FOIA | | Help | | Contact NSF | | Contact Web Master | | SiteMap |

The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated: 11/07/06
Text Only