This solicitation has been archived and replaced by NSF 23-541.

Addressing Systems Challenges through Engineering Teams (ASCENT)

PROGRAM SOLICITATION
NSF 22-534

REPLACES DOCUMENT(S):
NSF 21-521

National Science Foundation

Directorate for Engineering
   Division of Electrical, Communications and Cyber Systems

Preliminary Proposal Due Date(s) *(required)* (due by 5 p.m. submitter's local time):

   March 02, 2022

      Preliminary Proposal

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

   May 31, 2022

      Full Proposal by Invitation Only

IMPORTANT INFORMATION AND REVISION NOTES

This document replaces Program Solicitation NSF 21-521.

Revisions from NSF 21-521 include:

- Preliminary and Full Proposal submission dates are updated.
- Estimated Number of Awards is updated to be 4 to 5.
- The current solicitation will accept proposals that address specified research themes described in the solicitation.
- Instructions for preliminary proposal preparation are updated with theme selection requirement.
- Current and pending support information not required for Non-PI/co-PI personnel for preliminary proposal submission.
- Biographical sketches not required for Non-PI/co-PI personnel for preliminary proposal submission.
- Instructions for full proposal preparation are updated with theme selection requirement.
- The list of Cognizant Program Officers is updated.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 22-1), which is effective for proposals submitted, or due, on or after October 4, 2021.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

   Addressing Systems Challenges through Engineering Teams (ASCENT)

Synopsis of Program:

   The Electrical, Communications and Cyber Systems (ECCS) Division supports enabling and transformative research that fuels progress in engineering applications with high societal impacts. ECCS programs encompass novel electronic, photonic, and magnetic devices; communication systems, novel integrated circuits, antennas, sensors; machine learning, control, and networks, to name a few. The fundamental research supported by ECCS impacts a wide range of applications such as communications, energy and power, healthcare, environment, transportation, manufacturing, and other areas. ECCS strongly emphasizes the integration of education into its research programs to support the preparation of a diverse and professionally skilled workforce. ECCS also strengthens its programs through links to other areas of engineering, science, industry, government, and international collaborations.

The **Addressing Systems Challenges through Engineering Teams** (**ASCENT**) program is a strategic investment of ECCS that emphasizes new collaboration modalities among the various ECCS supported sub-disciplines. ASCENT encourages robust collaborations among the devices, circuits, algorithms, systems, and networks research communities to develop innovative projects. ASCENT seeks proposals that are bold and ground-breaking transcending the perspectives and approaches typical of disciplinary research efforts. ASCENT projects are expected to lead to disruptive technologies or nucleate entirely new research fields motivated by the most pressing societal challenges the global community faces.

In response to the national priority that calls for sustained scientific leadership and continued growth in semiconductor technology, **this ASCENT solicitation will focus on two specific research themes: Future Semiconductor Technology (FST) and Sustainable Micro-and Nano-Electronics (SMN).** Creation of new knowledge and disruptive innovations in microelectronics and their enabling semiconductor technology are critical challenges facing the engineering community. Targeting their bottleneck issues by ASCENT teams will help unlock their boundless potential and capture their incalculable benefits bestowed to 21st century society and beyond. The ASCENT will support innovative projects that address those themes through a deep-integrated or a convergent research approach driven by fundamental knowledge and cross-disciplinary expertise central to ECCS core programs, while potentially leveraging advanced materials, power electronics, novel computing architectures and emerging design, learning, and fabrication technologies.

Assuming sufficient funding is provided in the NSF budget, it is anticipated that the ASCENT competition will continue with research themes and priorities subject to changing in the subsequent years.

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.

- Ruyan Guo, telephone: (703) 292-7718, email: rguo@nsf.gov
- Aranya Chakrabortty, telephone: (703) 292-8113, email: achakrab@nsf.gov
- Zhengdao Wang, telephone: (703) 292-7823, email: zwang@nsf.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 4 to 5

4 to 5 each from $1,000,000 to $1,500,000 for a period of four years.

Anticipated Funding Amount: $6,000,000

The number of awards and award size/duration are subject to the availability of funds and the quality of the proposals.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

PIs or co-PIs must hold primary, full-time, paid appointments in research or teaching positions at US-based campuses/offices of IHEs eligible to submit to this solicitation (see above), with exceptions granted for family or medical leave, as determined by the submitting institution.

A minimum of three PIs or co-PIs must participate in each proposal. Each PI/co-PI is expected to contribute complementary expertise relevant to the project proposed. Investigators/Senior Personnel with expertise in fabrication, testing, or other sciences may be considered, where appropriate.

If there are strong collaborations with industry, the Grant Opportunities for Academic Liaison with Industry (GOALI) type of proposal can be used in conjunction with this solicitation. See PAPPG Chapter II.E.4 for additional information and guidance.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or co-PI: 1

No individual may be a PI, Co-PI, or Senior Personnel on more than one ASCENT proposal in the current review cycle. Please be advised that if an individual's name appears in any of the above-mentioned capacities on more than ONE proposal, all submittals after the first proposal (based on time- stamp) 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 Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposals:**
  - Full Proposals submitted via FastLane: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
  - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
  - 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: https://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

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. submitter's local time):

  March 02, 2022

    Preliminary Proposal

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

  May 31, 2022

    Full Proposal by Invitation Only

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review criteria 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

The Electrical, Communications and Cyber Systems (ECCS) Division supports enabling and transformative engineering research that fuels progress in engineering system applications with high societal impact in health, security, and economic prosperity of the nation. ECCS programs align with national priorities including Semiconductors and Nanotechnology, Quantum Information Science, Communications Resiliency, Artificial Intelligence, Secure and Resilient Power Systems, Advanced Manufacturing, Industries of the Future, the development of a diverse Science, Technology, Engineering, and Mathematics (STEM) workforce, and those identified by the National Science Board in Vision 2030 for the coming decade.

The ASCENT program is one of the principal strategic investments of ECCS, which emphasizes on new collaboration modalities among various sub-disciplines of ECCS-supported research. The goal of the ASCENT program is to enable the ECCS-served engineering community to come together as interdisciplinary teams that address research problems that span across multiple sets of research threads. ASCENT projects are expected to be of much larger scope (in terms of budget, research vision, and work plan) than regular unsolicited projects supported by individual ECCS core programs. They are envisioned to have a significant impact on a variety of application domains including healthcare, security, disaster mitigation, telecommunications, sustainable energy, climate and environment, transportation, manufacturing, and other areas.

II. PROGRAM DESCRIPTION

The intent of the ASCENT program is to stimulate collaborations among different ECCS sub-communities and to enable synergistic effort addressing large-scale cross-disciplinary problems whose solutions are beyond the scope of individual or divided efforts. ASCENT projects are expected to be driven by fundamental knowledge and cross-disciplinary expertise central to ECCS community while leveraging advanced materials, power electronics, novel computing architectures, or emerging design, learning, and fabrication technologies for example, to enable the penetration of the advanced analog and digital devices, light sources, and sensors into breakthrough system-level solutions. Collaborations across research communities in devices, circuits, algorithms, communications, dynamics and controls, and machine learning are highly encouraged. Research ideas for an ASCENT project will be of much larger scope than a core unsolicited project. At the same time, an ASCENT project should not be just a conglomeration of multiple disparate efforts and must be well-integrated in terms of both collaboration and research outcomes.

ASCENT project teams are envisioned to solve compelling research problems that demand a connected portfolio of multiple integrated ECCS research areas, for example, from devices to sensing and communications, to systems, controls, and data science, which is characteristic of convergent engineering research. More information about ASCENT-supported research areas can be found from the current ECCS Division Programs or by consulting an ECCS Program Officer. The ASCENT program intends to challenge the community to go beyond the research normally supported by ECCS unsolicited or core programs and to develop innovative and interdisciplinary projects. **Proposals for which the research topic or the set of skills of PIs is primarily within one research area are not appropriate for ASCENT.**

ECCS has been supporting research on solid-state devices, sensing, computing, and communication, in conjuncture with semiconductors and microelectronics. While semiconductor technology has thrived with rapid innovations, its historical rate of progress is no longer guaranteed as the reduction in feature size to improve performance and reduce costs is reaching its physical limits. The unprecedented technological challenges facing the current semiconductor technology paradigm calls for creation of new knowledge and disruptive innovations. Within this context, and in response to the national priority that calls for sustained scientific leadership and continued growth in semiconductor technology, ECCS invites ASCENT proposals that address fundamental cross-disciplinary research challenges in semiconductor and microelectronics. The 2022 fiscal year ASCENT solicitation will **focus on two specific research themes:**

     (1) Future Semiconductor Technology (FST) and

     (2) Sustainable Micro- and Nano-electronics (SMN).

Selection of one of these two Research Themes is **required** for ASCENT preliminary and full proposal submissions and **must be stated** in the first line of the Project Summary.

(1) Future Semiconductor Technology (FST): ASCENT research in this theme must advance fundamental understanding or create knowledge and innovations that **extend** semiconductor device frontiers beyond Moore's Law, **enable** systems and architectures beyond the von Neumann paradigm, **empower** functionalities or **enhance** performance by integration with semiconductor integrated circuits (ICs). Examples that embrace future semiconductor technologies may include (but are not limited to):

Extending device frontiers beyond Moore's Law: 3D semiconductor logic devices, memories, interconnects, and IC structures for power scaling. Active CMOS. Wireless optimized CMOS. High efficiency power electronics based on wide bandgap semiconductors. Non-charge driven or scale limiting low power and high frequency memory, logic, communication components by spintronics, tunnel junctions, phase transition materials, and advanced confinement of channel materials or geometry. Beyond CMOS devices with low energy consumption and low latency.

Enable systems and architectures beyond the von Neumann paradigm: Brain inspired/neuromorphic systems. On chip logic and memory that unite processor

cores, main memory, and communication channels. Advanced architectures enabled by nanoscale materials of superconductivity, spintronics, valleytronics, photonics, etc. that minimize ohmic energy losses and dramatically reduce die area per operation, overheads per action, latency per access, synchronization delays, and limitation of parallelism. Cryogenic electronics and novel interconnects. Optimization of local and global thermal budget, memory capacity, power source, and computing resources.

Empower functionalities or enhance performance by monolithic or heterogeneous integration: On-chip vertical monolithic or heterogenous integration by holistic design and optimization for advanced functionalities. Spectral extensions (RF/THz to optical) or reconfigurable systems integrating CMOS (or beyond Si technology) with photonics, quantum, optoelectronic or multiferroic devices and circuits. Package level heterogeneous integration for multimodal/multi-frequency sensing and actuation. Integrating edge devices with cloud computing through AI/ML algorithm and hardware advancement, targeting high privacy, always available, low latency, and energy efficiency.

(2) Sustainable Micro- and Nano-electronics (SMN). ASCENT research in this theme places micro- and nano-electronics questions involving the energy efficiency and environmental impact into a focal context. Topics include but not limited to:

Si- (or beyond Si) technology-compatible green and energy-efficient (mechanical, thermal, and RF) transduction of one form of physical energy to another, of a particular interest for advanced thermal solutions for microchips. Advanced photovoltaics that significantly enhance the performance while using materials which are non-toxic. Power managing circuits, enhanced efficiency devices and systems, sustainable energy conversion systems, clean energy storage, and edge computing. Smart sensors, smart energy, and micro- or nano-batteries. A combination of semiconductor electronic, photonic, or phononic devices integrated within thin, compliant, and stretchable form factors in environmental monitoring and health diagnosis. Degradable, wearable, flexible and printed electronics for sensing, stimulation, and communication. Important considerations are high energy efficiency and low environmental impact for low power electronics, ubiquitous sensing, always available communications, and Internet-of-Things edge computing. The outcomes will inform the engineering community the research directions that shape the microelectronic technology into the next century.

ASCENT proposals must demonstrate the need for a convergent engineering research effort by an integrated team and must include a research integration plan and a timeline for research activities, with convincing mechanisms for frequent and effective communication among team members. ASCENT proposals should articulate the approach for the creation of new knowledge and discovering solutions on systems level as proposed, through the rigorous integration of disciplinary knowledge spanning disparate engineering and scientific disciplines. Holistic approaches that include co-design of heterogeneous systems, hybrid fabrications of scalable process, as well as collaborations with fabs or foundries, are encouraged.

In addition to innovative research, projects are expected to engage and train students to conduct collaborative and convergent research. The outcome of the activities should include students being prepared to enter the workforce and to advance the frontiers of science and engineering.

The ASCENT program is not intended to solely support technology translation; thus, projects that are developmental in nature and more suitable for industries are not appropriate. For fundamental research with strong collaborations with industry, the Grant Opportunities for Academic Liaison with Industry (GOALI) mechanism may be used in conjunction with this solicitation.

III. AWARD INFORMATION

Anticipated Type of Award: Continuing Grant or Standard Grant

Estimated Number of Awards: 4 to 5 each from $1,000,000 to $1,500,000 for a period of four years

Anticipated Funding Amount: $6,000,000

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

PIs or co-PIs must hold primary, full-time, paid appointments in research or teaching positions at US-based campuses/offices of IHEs eligible to submit to this solicitation (see above), with exceptions granted for family or medical leave, as determined by the submitting institution.

A minimum of three PIs or co-PIs must participate in each proposal. Each PI/co-PI is expected to contribute complementary expertise relevant to the project proposed. Investigators/Senior Personnel with expertise in fabrication, testing, or other sciences may be considered, where appropriate.

If there are strong collaborations with industry, the Grant Opportunities for Academic Liaison with Industry (GOALI) type of proposal can be used in conjunction with this solicitation. See PAPPG Chapter II.E.4 for additional information and guidance.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or co-PI: 1

> **No individual may be a PI, Co-PI, or Senior Personnel on more than one ASCENT proposal in the current review cycle.** Please be advised that if an individual's name appears in any of the above-mentioned capacities on more than ONE proposal, all submittals after the first proposal (based on time- stamp) will be returned without review. No exceptions will be made.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals *(required)*: Preliminary proposals are required and must be submitted via FastLane or Research.gov, even if full proposals will be submitted via Grants.gov.

Preliminary proposals should provide a brief overview of the project, its scope and expected outcome focusing on its interdisciplinary and transformative aspects. It should include sufficient information to allow assessment of the main ideas, approaches, and the responsiveness of the proposal to the solicitation.

Preliminary Proposal Preparation Instructions:

Preliminary proposals must be submitted via FastLane or Research.gov in accordance with the instructions below. **Preliminary proposals that are not compliant with this solicitation will be returned without review**. It is the submitting institution's responsibility to ensure that the proposal is compliant with all applicable requirements. Preliminary proposals **should not include separate subaward budgets** but **should include planned levels for subawards on the budget justification page**. Preliminary proposals must contain the items listed below and must strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet all formatting requirements for font size and characters per inch as specified in the PAPPG.

Preliminary proposals must include the following items:

Cover Sheet: Entries on the Cover Sheet are limited to the principal investigator and a maximum of four co-principal investigators. A minimum of three principal and co-principal investigators must be identified. Additional investigators can be listed on the project summary page and entered as Senior Personnel.

Title of Proposed Project: The title for the proposed project must begin with "ASCENT Preproposal:". The title must state clearly and succinctly the major theme(s) of the project. Titles of proposals involving GOALI, must begin with "ASCENT Preproposal: GOALI:".

Project Summary (one-page limit): The project summary may not exceed one page in length and must consist of three parts:

> 1. In the Overview section using the first line to specify the **Research Theme selected**: Future Semiconductor Technology (FST) or Sustainable Micro- and Nano-electronics (SMN). State the objectives of the project and research aims that support those objectives;
>
> 2. Provide a succinct summary of the *intellectual merit* of the proposed project. This should include the scope of the research and the interdisciplinary and transformative nature of the proposed research; and
>
> 3. Describe the *broader impacts* of the proposed work, including the potential long-term impact on a national need or grand challenge.

Preliminary proposals that do not separately address in the project summary both intellectual merit and broader impacts will be returned without review.

Project Description (five-page limit): The project description of **the preliminary proposal is limited to five pages** and should include the following three sections:

> 1. **Vision and Goals** – Describe the vision and specific goals of the proposed research, identify knowledge gaps or engineering challenges the project is to address;
>
> 2. **Innovation and Approach** – Describe the main innovation and the approach that will be used to achieve the vision and goals; and
>
> 3. **Interdisciplinary and Transformative Impact** – Describe the transformative aspects of the project, including how the collaboration of different disciplines will enable a significant advancement of fundamental engineering knowledge and enable discovery of new solutions. Include a succinct statement of anticipated Broader Impacts on a national need or grand challenge. Provide an outline of the strategies to engage and train students to conduct collaborative and convergent research.

References Cited: Indicate with an asterisk any cited publications by the PI, co-PIs and other senior personnel (identified on the required Supplementary Document list of Key Personnel Involved), which result from current or prior research funded by NSF.

Biographical sketches: The standard NSF biographical sketches for the PI and co-PIs identified on the cover page must be provided.

Budget: The preliminary proposal must include a budget for each of the four years proposed. FastLane or Research.gov will automatically provide a cumulative budget. Preliminary proposals **should not include separate subaward budgets**. However, the **budget justification should include planned levels for subawards to any partner institution(s)**. Enter the anticipated total level of subaward support on line G5, Subawards.

Current and Pending Support for the PI and co-PIs identified on the cover page must be included.

In the **Supplementary Documentation** section, include the following:

List of **Key Personnel Involved** (maximum one page), including the title of the project, the name of the PI, the lead institution, and a list of co-PIs and senior personnel, including any subawardees, together with their institution(s). Also include a description of the expertise each person brings to the project and how this expertise will be applied to achieve convergent research. Avoid listing personnel who will not substantively contribute to the project goals.

No other supplemental documentation (postdoctoral mentoring plan, data management plan, or letter of collaboration) may be included for preliminary proposal submission.

In the **Single Copy Documents** section, include the following:

Collaborators and Other Affiliations Information: Proposers should follow the guidance specified in Chapter II.C.1.e of the NSF PAPPG.

Preliminary proposals may be reviewed by ad-hoc and/or by panels of outside experts. Review of the preliminary proposals will emphasize the potential transformative nature and impact of the proposed idea on solving a pressing engineering systems challenge. Based on the reviews, a limited number of teams will be invited to submit full proposals. Invited proposers should expect to receive an invitation to submit a full proposal by the middle of April 2022.

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via FastLane, Research.gov, or Grants.gov.

- 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 Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. 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 Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. The Prepare New Proposal setup will prompt you for the program solicitation number.
- 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: (https://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) 292-8134 or by e-mail from nsfpubs@nsf.gov.

See PAPPG Chapter II.C.2 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 PAPPG instructions.

Based on the review of preliminary proposals, a limited number of teams will be invited to submit a full proposal.

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 must be a single proposal** with subaward(s) administered by the submitting organization. The type of collaborative proposals by a simultaneous submission from multiple organizations with each organization requesting a separate award will not be accepted. PAPPG Chapter II.D.3 provides additional information on collaborative proposals.

The following information supplements the guidelines and requirements in the NSF PAPPG and NSF Grants.gov Application Guide and apply to full proposals submitted to this solicitation:

Full proposals will be accepted only from PIs who have submitted preliminary proposals in the current review cycle and who were invited to submit a full proposal. Submission of full proposals by PIs whose preliminary proposals received a review recommendation of 'Not Invited' will be returned without review.

Proposers should select either the "Research" or "GOALI" proposal type as appropriate in either FastLane or Research.gov.

Cover Sheet: Entries on the Cover Sheet are limited to the principal investigator and a maximum of four co-principal investigators. A minimum of three principal and co-principal investigators must be identified. Additional Investigators should be listed on the project summary page and entered as Senior Personnel. When preparing the Cover Sheet for full proposals, please provide the related preliminary proposal number.

Title of Proposed Project: The title for the proposed project must begin with "ASCENT:". The title must state clearly and succinctly the major theme(s) of the project. Titles of proposals involving **GOALI**, must begin with "GOALI: ASCENT:".

Project Summary (one-page limit): The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. Provide the following information:

1. In the *Overview* section using the first line to specify the **Research Theme selected**: Future Semiconductor Technology (FST) or Sustainable Micro- and Nano-electronics (SMN). State the objectives of the project and research aims that support those objectives;

2. Provide a succinct summary of the intellectual merit of the proposed project. This should include the scope of the research and the interdisciplinary and transformative nature of the proposed research; and

3. Describe the broader impacts of the proposed work, including the potential long-term impact on national needs or a grand challenge.

Project Description (15-page limit): The project description must adhere to the requirements defined in Chapter II of the PAPPG. Proposers are encouraged to consider the Additional Solicitation-Specific Review Criteria when preparing the project description. In addition to the requirements in the PAPPG, **the Project Description must contain, as a separate section of less than a page, a section labeled "Addressing ASCENT Solicitation-Specific Review Criteria".** This section should provide a description of how the ASCENT solicitation-specific review criteria (see VI.A.3) are addressed in the proposal and include

references to other relevant sections in the proposal for additional details. Proposals not meeting this requirement will be returned without review.

Budget: Develop a realistic project budget that is consistent with the proposed activities. Provide detailed budget justifications separately for each sub-awardee institution involved if applicable. Proposed budgets must include funds for travel by at least one PI or co-PI and at least one graduate student or researcher to attend a biennial one-day grantees' meeting in the Washington, DC area, held within the first two years of the award and two years thereafter.

Facilities, Equipment, and Other Resources: Provide a description of available facilities and procedures for their use/access, if applicable. For projects requiring additional equipment, justify the need for these resources in the context of the innovative work proposed.

Supplementary documents must include the following Special Information:

Research Integration Plan. A Research Integration Plan is required for all projects. **The Research Integration Plan must be submitted as a Supplementary Document and may not exceed two pages. Proposals that fail to submit a Research Integration Plan will be returned without review.** The Research Integration Plan must be labeled "Research Integration Plan" and should include the following:

1. Provide a list of the PI, co-PIs, and Senior Personnel, with a description of the expertise each person brings to the project and how this expertise will be applied to achieve convergent research.

2. Identify the key disciplines involved to achieve the objectives of the proposed research, explain the importance of each discipline and why formation of the engineering team is necessary for the creation of new knowledge and discovering solutions on systems level as proposed.

3. Outline the management approach to the integration of these disciplines, including responsibilities, means of communication, management of personnel within the project team, management of intellectual property resulting from the project, project assessment, risk mitigation measures, and timeline of activities. The management plan should also describe how students will be engaged in and trained through collaborative research across the multiple disciplines.

Other Supplementary documents are limited to the specific types of documents listed in the PAPPG, including as appropriate:

1. **Letters of Collaboration**: For proposals involving substantial collaboration with individuals not included in the budget, proposers should include letters confirming the collaborations. Letters of collaboration should follow the format instructions specified in PAPPG Chapter II.C.2.j. For GOALI proposals, a GOALI-Industrial co-PI Confirmation Letter from the industrial partner must be submitted with the full proposal.

2. Proposals that include support for postdoctoral researchers must provide a **postdoctoral researcher mentoring plan** (limited to one page); and

3. Proposals must include a **Data Management Plan** (DMP; limited to two pages). The DMP should clearly articulate how the investigators plan to manage and disseminate both the physical and digital data generated by the project, taking advantage of emerging information technologies and cyberinfrastructure. The plan must include sufficient detail for evaluation of its appropriateness during merit review. For Engineering Directorate guidance on DMP, see https://www.nsf.gov/eng/general/ENG_DMP_Policy.pdf.

Single Copy Documents section must include **Collaborators and Other Affiliations (COA) Information** in accordance with the guidance specified in Chapter II.C.1.e of the NSF PAPPG.

Supplementary and single copy documents should be submitted even if the information is unchanged since the submission of the preliminary proposal.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. submitter's local time):

  March 02, 2022

    Preliminary Proposal

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

  May 31, 2022

    Full Proposal by Invitation Only

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: https://www.fastlane.nsf.gov/a1/newstan.htm. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?
_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and

Research.gov systems. 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: https://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 or Research.gov may use Research.gov 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 acknowledgment 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 PAPPG Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: https://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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. 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. (PAPPG 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 PAPPG 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 other underrepresented groups 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

Reviewers will be asked to:

- Comment on the extent to which the project scope presents a compelling large-scale convergent engineering research problem that critically integrates more than one ECCS research area.
- Comment on the degree to which the Research Integration Plan and Project Description demonstrates the commitment of the participating investigators to work synergistically to accomplish the project objectives including engaging and training students in collaborative and convergent research.
- Comment on the degree to which the Research Integration Plan demonstrates that the participating investigators have the necessary expertise covering related research fields sufficient to accomplish the project objectives.
- Comment on the extent to which the project scope justifies the requested budget and is unsuitable for smaller teams or shorter duration.

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 https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 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 *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

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 Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

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:

- Ruyan Guo, telephone: (703) 292-7718, email: rguo@nsf.gov
- Aranya Chakrabortty, telephone: (703) 292-8113, email: achakrab@nsf.gov
- Zhengdao Wang, telephone: (703) 292-7823, email: zwang@nsf.gov

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188
- FastLane Help Desk e-mail: fastlane@nsf.gov

- Research.gov Help Desk e-mail: rgov@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 https://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 (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 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 https://www.nsf.gov

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314

- **For General Information** (NSF Information Center)**:** (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

    Send an e-mail to: nsfpubs@nsf.gov

    or telephone: (703) 292-8134

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See System of Record Notices, NSF-50, "Principal Investigator/Proposal File and Associated Records," and NSF-51, "Reviewer/Proposal File and Associated Records." 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
Policy Office, Division of Institution and Award Support
Office of Budget, Finance, and Award Management
National Science Foundation
Alexandria, VA 22314

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