

**NSF Faculty Career Development Program (CAREER)  
NSF 22-586  
Checklist and Timeline**

**Deadline: Wednesday, July 26, 2023**

**Eligibility**

A Principal Investigator (PI) may submit only **one** CAREER proposal per annual competition. In addition, a Principal Investigator may not participate in **more than three** CAREER competitions total. PIs must meet all of the following eligibility requirements:

- Hold a doctoral degree in a field supported by NSF;
- Be engaged in research in an area of science, engineering, or education supported by NSF;
- Hold at least a 50% tenure-track (or tenure-track-equivalent) position as an assistant professor (or equivalent title);
- Be untenured; and
- Have not previously received a CAREER award (*Prior or concurrent Federal support for other types of awards for non-duplicative research does not preclude eligibility*)

**Program Guidance and FAQs:** <https://beta.nsf.gov/funding/opportunities/faculty-early-career-development-program-career>

**NSF's Grant Proposal Guide (PAPPG):** <https://beta.nsf.gov/policies/pappg/23-1> (effective 1/30/23)

**Additional Resources:**

- **New** Biographical Sketch Instructions: <https://www.nsf.gov/bfa/dias/policy/biosketch.jsp>
- **New** Current and Pending Instructions: <https://www.nsf.gov/bfa/dias/policy/cps.jsp>
- SciENCv Resources and Help Guides: <https://www.utc.edu/research/research-and-sponsored-programs/sciencv-guide>

**Formatting:**

- Margins, in all directions, must be at least one inch.
- No more than six lines of text within a vertical space on an inch.
- **Do not paginate proposal sections.**
- Use one of the following fonts:
  - Arial, Courier New, or Palatino Linotype at a font size 10 points or larger;
  - Times New Roman at a font size 11 points or larger; or
  - Computer Modern family of font size of 11 points or larger.
  - A font size of at less than 10 points may be used for mathematical formulas or equations, figures, tables, or diagram captions and when using a symbol font to insert Greek letters of special characters.
- Note: If using Arial 10, you must set the line spacing to “exactly 12pt” or it will cause line spacing warnings during upload to Research.gov

**Please follow the below deadlines as closely as possible, to ensure adequate time for ORSP to review your proposal for compliance.**

Proposal Component/Activity	Notes/Requirements	Deadline
<b>PO Contact</b>	<p>PIs are strongly encouraged to contact the cognizant program officers to discuss the proposed project and budgetary request limitations.</p> <p>A list of CAREER Division/Directorate Contacts can be found on the CAREER web page at <a href="https://www.nsf.gov/crssprgm/career/contacts.jsp">https://www.nsf.gov/crssprgm/career/contacts.jsp</a>.</p>	<p>PI completes ASAP</p>
<b>Consultants &amp; subawards</b>	If you anticipate including a consultant or subaward in your project, additional documentation and budgetary information is required. If applicable, please contact your ORSP liaison by <b>June 15</b> for additional details.	<p>PI completes by <b>June 15</b></p>
<b>Working with Hamilton County Schools (HCS)</b>	If HCS will be involved, board approval may be required. PI should provide ORSP with a project title, one-page summary/abstract, brief description of HCS's involvement, and a proposed budget. Note that the budget can still be in draft form. ORSP will send this information to HCS to put on the board meeting agenda.	<p>PI completes ASAP</p>
<b>Create NSF Account</b>	<p>If you do not have an NSF account (NSF ID), you must register for one in order to prepare proposals and conduct other award-related activities using NSF systems. For step-by-step instructions, please see the Register for an <a href="#">NSF Account to Begin Using Research.gov</a>. A <a href="#">Register for an NSF Account video tutorial</a> is also available.</p> <p>Then follow the guidance <a href="#">here</a> to request the PI role.</p>	<p>PI completes ASAP</p>
<b>Grant ORSP Access in Research.gov</b>	Proposal should be submitted through <a href="#">Research.gov</a> . Initiate the proposal and share with your Grant Specialist.	<p>PI completes by June 24</p>
<b>Cover Sheet</b>	<p>The following instructions supplement the guidelines in the NSF PAPPG:</p> <ul style="list-style-type: none"> <li>• <b>Program Solicitation Number.</b> Select the CAREER program solicitation number in Step 1 of the Prepare New Proposal Wizard (Funding Opportunity).</li> <li>• <b>NSF Unit of Consideration.</b> Select at least one specific core program in Step 2 of the Prepare New Proposal Wizard (Where to Apply). For assistance in determining which program(s) to choose, refer to the NSF <a href="#">Guide to Programs</a>, which provides descriptions of NSF research-supporting programs.</li> <li>• <b>Project Title.</b> The project title must begin with "CAREER:" and follow with an informative title.</li> <li>• <b>Co-PIs.</b> No co-PIs are permitted on the Cover Sheet.</li> </ul>	<p>PI completes by June 24</p>

	<p><b>Human Subjects:</b> If you will be conducting research that involves human subjects, including assessing educational and/or outreach activities, the human subjects box on the Cover Sheet must be checked. PI should submit IRB protocol approximately 6-8 months after submission. Contact <a href="mailto:irb@utc.edu">irb@utc.edu</a> with questions.</p> <p><b>Select Agents:</b> The box for “Potential Life Sciences Dual Use Research of Concern” must be checked on the Cover Sheet if use of select agents or other enhanced potential pandemic pathogens, as defined by the <a href="#">Policy</a>, are envisioned, and those agents or PPPs are used in ways that lead to enhancement of specific properties specified within the Policy. Additional documentation and procedures will be required at time of award.</p>	
<b>Project Summary</b>	<p>Refer to the PAPPG (II.D.2.b) for additional information.</p> <p>The overview includes a description of the activity that would result if the proposal were funded and a statement of objectives and methods to be employed. The statement on intellectual merit should describe the potential of the proposed activity to advance knowledge. The statement on broader impacts should describe the potential of the proposed activity to benefit society and contribute to the achievement of specific, desired societal outcomes.</p> <p>The Project Summary should be informative to other persons working in the same or related fields, and, insofar as possible, understandable to a broad audience within the scientific domain. It should not be an abstract of the proposal.</p>	PI completes by July 24
<b>Project Description</b> (15 pages max)	<p><b>Review the solicitation and PAPPG for additional details. A separate section titled “Broader Impacts” is required.</b> A separate section titled Intellectual Merit is not required.</p> <p>The Project Description section should contain a well-argued and specific proposal for activities that will, over a 5-year period, build a firm foundation for a lifetime of contributions to research and education in the context of the PI's organization. The proposed project should aim to advance the employee's career goals and job responsibilities as well as the mission of the department or organization. The Project Description should include:</p> <ul style="list-style-type: none"> <li>• a description of the proposed research project, including preliminary supporting data where appropriate, specific objectives, methods and procedures to be used, and expected significance of the results;</li> <li>• a description of the proposed educational activities and their intended impact;</li> <li>• a description of how the research and educational activities are integrated or synergistic;</li> <li>• a description of other broader impacts, besides the education activities, that will accrue from the project; and</li> <li>• results of prior NSF support, if applicable.</li> </ul>	PI completes by July 24

	<p>Successful applicants will propose creative, effective research and education plans, along with strategies for assessing these components. The proposed activities should help applicants develop in their careers as both outstanding researchers and educators. While excellence in both education and research is expected, activity of an intensity that leads to an unreasonable workload is not. The research and educational activities do not need to be addressed separately if the relationship between the two is such that the presentation of the integrated project is better served by interspersing the two throughout the Project Description.</p> <p><i>Education Activities</i> – The education component of the proposal may be in a broad range of areas and may be directed to any level: K-12 students, undergraduates, graduate students, and/or the general public, but should be related to the proposed research and consistent with the career goals of the PI. Some examples are: incorporating research activities into undergraduate courses; teaching a graduate seminar on the topic of the research; designing innovative courses or curricula; providing mentored international research experiences for U.S. students; linking education activities to industrial, international, or cross-disciplinary work; supporting teacher preparation and enhancement; conducting outreach and mentoring activities to enhance scientific literacy or involve students from groups that have been traditionally underrepresented in science; researching students' learning and conceptual development in the discipline; implementing innovative methods for evaluation and assessment; or creating cyberinfrastructure that facilitates involvement of the broad citizenry in the scientific enterprise. Education activities may also include designing new or adapting and implementing effective educational materials and practices. Such activities should be consistent with research and best practices in curriculum, pedagogy, and evaluation. Proposers may build on, or otherwise meaningfully participate in, existing NSF-supported activities or other educational projects ongoing on campus.</p> <p>The solicitation provides further guidance on proposals that involve <b>cross-disciplinary, cross-sector</b>, scientific software development, international/global dimensions, polar field work, and seagoing facilities.</p>	
<b>References Cited</b>	<p>Provide references in support of both research and education aspects of the CAREER proposal. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. The References page is uploaded directly in Research.gov.</p>	<p>PI completes by <b>July 24</b></p>
<b>Budget</b>	<p><b>Work with ORSP to draft and finalize your budget.</b></p> <p>The CAREER award, including indirect costs, is expected to total a <b>minimum of \$400,000</b> for the 5-year duration, with the following exceptions:</p> <ul style="list-style-type: none"> <li>Awards for proposals to the <b>Directorate for Biological Sciences (BIO) or the Directorate for Engineering (ENG)</b> are expected to total a <b>minimum of \$500,000</b> for the 5-year duration.</li> </ul>	<p>Draft budget <b>ASAP</b></p> <p>Finalize budget <b>June 24</b></p>

	<p>Review the previous CAREER awards <a href="#">here</a> to determine the award range for the program you're targeting typically funds. You can also ask the PO what the typical award size is.</p> <p>Awards for proposals to the <b>Directorate for Computer and Information Science and Engineering</b> are expected to support one month of PI salary per year, one graduate student per year, and two trips per year; this may vary depending on individual circumstances, e.g., if the PI already has salary support.</p> <p>Co-PIs are not allowed in CAREER proposals. Support for other senior personnel (i.e., in the Budget Category A) or consultants is permitted but must be commensurate with their limited role in the project. In particular, while recognizing that projects may entail cross-disciplinary collaborations, it is expected that the primary support for a CAREER award will be for the PI and his/her research efforts. All other allowable costs, as described in the PAPPG, are permitted. Allowable costs include funds for postdoctoral fellows, graduate students, undergraduate students, PI salary, education or outreach activities, support for an evaluator, travel and subsistence expenses for the PI and U.S. participants when working abroad with foreign collaborators, and consultant expenses. In some cases, it may be appropriate to include academic year salary support for the PI on a CAREER budget (for example, PIs who have heavy teaching responsibilities or who must conduct field work during the academic year). Proposers should talk to the cognizant Program Officers about their individual cases.</p>	
<b>Budget Justification</b> (5 pages max)	<p>Refer to the PAPPG for additional guidance. The budget justification is uploaded directly in Research.gov. With enough lead time, ORSP can help draft a budget justification outline.</p> <p>An NSF budget justification template can be found here: <a href="https://www.utc.edu/research-sponsored-programs/nsf-career.php">https://www.utc.edu/research-sponsored-programs/nsf-career.php</a>.</p>	PI completes by July 24
<b>Biographical Sketches</b> (3 pages max) (Use approved template)	<p>Required for all key personnel (PI and Senior Personnel). The Biographical Sketch should be prepared following the instructions in the latest <i>NSF Proposal &amp; Award Policies &amp; Procedures Guide</i> (PAPPG) and should include <b>both research and education activities and accomplishments</b>.</p> <p>Biosketches must be prepared using one of two NSF-approved formats:</p> <ul style="list-style-type: none"> <li>Fillable PDF: <a href="https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf">https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf</a></li> <li>SciENcv: <a href="https://www.ncbi.nlm.nih.gov/sciencv/">https://www.ncbi.nlm.nih.gov/sciencv/</a></li> </ul> <p>The mandate to use SciENcv only for preparation of the biographical sketch will go into effect for new proposals submitted or due on or after October 23, 2023. In the interim, proposers may continue to prepare and submit this document via use of SciENcv or the NSF fillable PDF. NSF, however, encourages the community to use SciENcv prior to the October 2023 implementation.</p> <p>More guidance can be found at <a href="https://www.nsf.gov/bfa/dias/policy/biosketch.jsp">https://www.nsf.gov/bfa/dias/policy/biosketch.jsp</a>.</p>	PI collects for all personnel by July 13

<p><b>Current and Pending Support</b> (Use approved template)</p>	<p>Required for all key personnel (PI and Senior Personnel).</p> <p>This section of the proposal calls for required information on all current and pending support for ongoing projects and proposals, <b>including this project</b>, and any subsequent funding in the case of continuing grants. All current project support from whatever source (e.g., Federal, State, local, foreign, public or private foundations, industrial or other commercial organizations, or internal funds allocated toward specific projects) must be listed.</p> <p>Current and Pending must be prepared using one of two NSF-approved formats:</p> <ul style="list-style-type: none"> <li>• Fillable PDF: <a href="https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf">https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf</a></li> <li>• SciENcv: <a href="https://www.ncbi.nlm.nih.gov/sciencv/">https://www.ncbi.nlm.nih.gov/sciencv/</a></li> </ul> <p>The mandate to use SciENcv only for preparation of the biographical sketch will go into effect for new proposals submitted or due on or after October 23, 2023. In the interim, proposers may continue to prepare and submit this document via use of SciENcv or the NSF fillable PDF. NSF, however, encourages the community to use SciENcv prior to the October 2023 implementation.</p> <p>More guidance can be found at <a href="https://www.nsf.gov/bfa/dias/policy/cps.jsp">https://www.nsf.gov/bfa/dias/policy/cps.jsp</a>.</p>	<p>PI collects for all personnel by <b>July 13</b></p>
<p><b>Collaborators and Other Affiliations</b> (Use approved template)</p>	<p>Required for all key personnel (PI and Senior Personnel).</p> <p>The template has been developed to be fillable; however, the content and format requirements must not be altered by as this will create printing and viewing errors. This template must be saved in .xlsx format and directly uploaded as a Collaborators and Other Affiliations Single Copy Document.</p> <p>A template can be accessed here: <a href="https://nsf.gov/bfa/dias/policy/coa.jsp">https://nsf.gov/bfa/dias/policy/coa.jsp</a>.</p>	<p>PI collects for all personnel by <b>July 13</b></p>
<p><b>Facilities, Equipment, and Other Resources</b></p>	<p>This section of the proposal is used to assess the adequacy of the resources available to perform the effort proposed to satisfy both the Intellectual Merit and Broader Impacts review criteria. Proposers should describe only those resources that are directly applicable. Proposers should include an aggregated description of the internal and external resources (both physical and personnel) that the organization and its collaborators will provide to the project, should it be funded. Such information must be provided in this section, in lieu of other parts of the proposal (e.g., Budget Justification, Project Description). The description should be narrative in nature and must not include any quantifiable financial information. The Facilities document is uploaded directly in Research.gov.</p> <p>Review the PAPPG and program solicitation for more information. A template can be found here: <a href="https://www.utc.edu/research-sponsored-programs/nsf-career.php">https://www.utc.edu/research-sponsored-programs/nsf-career.php</a></p>	<p>PI completes by <b>July 24</b></p>

Supplementary Documents		
<b>Data Management Plan (2 pages max)</b>	<p>The Data Management Plan should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results (see Chapter II.D.2.i of the PAPPG for more details), and may include:</p> <ol style="list-style-type: none"> <li>1. the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;</li> <li>2. the standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);</li> <li>3. policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;</li> <li>4. policies and provisions for re-use, re-distribution, and the production of derivatives; and</li> <li>5. plans for archiving data, samples, and other research products, and for preservation of access to them.</li> </ol> <p>Data management requirements and plans specific to the Directorate, Office, Division, Program, or other NSF unit, relevant to a proposal are available on the NSF website. If guidance specific to the program is not available, then the requirements established in this section apply. UTC's library can also assist with developing data management plans. Please follow this link to schedule an appointment: <a href="https://www.utc.edu/library/services/data-management.php">https://www.utc.edu/library/services/data-management.php</a></p>	<p>PI completes by July 24</p>
<b>Postdoctoral Researcher Mentoring Plan (1 page max, if applicable)</b>	<p>Each proposal that requests funding to support postdoctoral researchers must upload the supplementary documentation section of Research.gov, a description of the mentoring activities that will be provided for such individuals. In no more than one page, the mentoring plan must describe the mentoring that will be provided to all postdoctoral researchers supported by the project, regardless of whether they reside at the submitting organization, any subrecipient organization, or at any organization participating in a simultaneously submitted collaborative proposal.</p>	<p>PI completes by July 24 (if applicable)</p>
<b>Departmental Letter (2 pages max)</b>	<p><b>Required - a proposal submitted without this Letter will be returned without review.</b></p> <p>To demonstrate the department's support of the career development plan of the PI, the proposal must include one (and only one) letter from the PI's department head (or equivalent organizational official). In cases of joint appointments, the letter should be signed by both department heads. The letter, which will be included as part of the consideration of the overall merits of the proposal, should demonstrate an understanding of, and a commitment to, the effective integration of research and education as a primary objective of the CAREER award. The Departmental Letter should be no more than 2 pages in length and include the department head's name and title below the signature. The letter should contain the following elements:</p>	<p>ORSP will provide template</p> <p>PI collects signed copy from DH by July 13</p>



	<ul style="list-style-type: none"> <li>• A statement to the effect that the PI is eligible for the CAREER program. For non-tenure-track faculty, the Departmental Letter must affirm that the investigator's appointment is at an early-career level equivalent to pre-tenure status, pursuant to the eligibility criteria specified above. Further, for non-tenure-track faculty, the Departmental Letter must clearly and convincingly demonstrate how the faculty member satisfies all the requirements of tenure-track equivalency as defined in the eligibility criteria specified in this solicitation.</li> <li>• An indication that the PI's proposed CAREER research and education activities are supported by and advance the educational and research goals of the department and the organization, and that the department is committed to the support and professional development of the PI; and</li> <li>• A description of a) the relationship between the CAREER project, the PI's career goals and job responsibilities, and the mission of his/her department/organization, and b) the ways in which the department head (or equivalent) will ensure the appropriate mentoring of the PI, in the context of the PI's career development and his/her efforts to integrate research and education throughout the period of the award and beyond.</li> </ul> <p>ORSP has a basic letter template on file. See <a href="https://www.utc.edu/research/research-and-sponsored-programs/nsf-career-program">https://www.utc.edu/research/research-and-sponsored-programs/nsf-career-program</a></p>	
<b>Letters of Collaboration</b>	<p>If the project involves collaborative arrangements of significance, these arrangements should be documented through letters of collaboration. Letters of collaboration should be limited to stating the intent to collaborate and should not contain endorsements or evaluation of the proposed project. <u>Letters of collaboration should follow the single-sentence format:</u></p> <p>“If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding by the NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment or Other Resources section of the proposal.”</p> <p>Each letter of collaboration must be <b>signed and dated</b> by the designated collaborator and appear on their letterhead.</p> <p><b>Departure from this format may result in the proposal being returned without review.</b> Specifics about the need for and nature of collaborations, such as intellectual contributions to the project, permission to access a site, an instrument, or a facility, offer of samples and materials for research, logistical support to the research and education program, or mentoring of U.S. students at a foreign site, should be detailed in the Project Description or the Facilities, Equipment, and other Resources section. Requests for letters of collaboration should be made by the PI well in advance of the proposal submission deadline.</p> <p><b>Important:</b> Letters of recommendation or letters of support are not allowed.</p>	<p>PI to send LOC draft to partner for review/ signature <b>ASAP</b></p> <p>Letter to be signed and returned to PI by no later than <b>July 24</b></p>



<p><b>Plan for Safe and Inclusive Field/Vessel/Aircraft Research</b>  <b>2 pgs. max</b>  (if applicable)</p>	<p>For each proposal that proposes to conduct research in the field, including on research vessels and aircraft, proposers must include a PSI-FVAR as a supplementary document. Research in the field is defined as data/information/samples being collected off-campus or off-site. All research should be done in an environment free from harassment.</p> <p>The plan should include the elements specified below.</p> <p><b>1. Background Information:</b></p> <ul style="list-style-type: none"> <li>• Description of Field Location(s) – (Note: only one PSI-FVAR is required per proposal if the research involves multiple locations).</li> <li>• Inclusion/Safety from Harassment (SfH) Challenges for the Location(s) – e.g., communication limitations due to isolation (satellite phone only?); diversity of local Community (using Community to indicate the human community) compared to diversity of field/vessel/aircraft team; cultural/language/legal differences that may present personnel safety challenges.</li> <li>• Inclusion/SfH Challenges for the Team – e.g., number and type of organizations involved in the team; number of experienced versus novice team members.</li> </ul> <p><b>2. Preparation for Fieldwork:</b></p> <p>(a) Inclusive Climate:</p> <ul style="list-style-type: none"> <li>• Planned Trainings – e.g., Nondiscrimination; Bystander Intervention; Allyship; Privilege; Cultural Competency; Anti-Harassment.</li> <li>• Planned processes to establish shared team definitions of roles, responsibilities, and culture – e.g., Code of Conduct, Code of Ethics.</li> <li>• Field Support Plan – e.g., mentor/mentee support; regular check-ins and/or events.</li> </ul> <p>(b) Safety from Harassment:</p> <ul style="list-style-type: none"> <li>• Incident Reporting/Communications Plan – e.g., within team, to organization(s); minimizing single points within the plan (e.g., single person overseeing access to a single satellite phone); specifics if multiple organizations involved; consideration of involvement outside the funded organization(s).</li> <li>• Field Incident Support Plan – e.g., real-time assistance resources (points of contact, hotlines); response activities (safety standdowns, return to organization guidance). In addition, the supplementary documentation section should alert NSF officials to unusual circumstances that require special handling, including, for example, proprietary or other privileged information in the proposal, matters affecting individual privacy, required intergovernmental review under E.O. 12372 (Intergovernmental Review of Federal Programs) for activities that directly affect State or local governments, or possible national security implications.</li> </ul>	<p>PI finalizes by  July 24  (if applicable)</p>
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	There is a two-page limitation on the PSI-FVAR. No embedded links are permitted. If a required section within the PSI-FVAR is not applicable, the proposer should specify that the section is not applicable. If multiple field research excursions (inclusive of multiple visits and/or sites) are proposed, only a single overarching PSI FVAR must be submitted.	
<b>Use of High-Performance Computing Resources, Data Infrastructure, or Advanced Visualization Resources</b> (if applicable)	NSF has a number of research infrastructure/resources available, if needed, each with their own requirements for consideration. See section II.E.7 of the PAPPG for more details.	PI reviews and incorporates into proposal, as applicable
<b>Submission</b>		
<b>Route proposal for internal approvals</b>	Enter and route proposal internally through <a href="#">Cayuse</a> for approvals. Proposals should be routed 5 business days before the deadline.	PI completes by <b>July 20</b>
<b>Submission</b>	<p>Schedule a submission meeting with ORSP.</p> <p>Note that there will be multiple CAREER proposals being submitted so schedule your timeslot early. NSF recommends submission by no later than <b>July 20</b> to allow time to resolve any system errors in advance of the deadline and avoid high volume delays at the NSF Help Desk.</p> <p>ORSP expects all proposals to be submitted <b>BEFORE noon on Wednesday, July 26</b></p>	Target: <b>July 24-25</b>

### Merit Review 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 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.