Study Guide - National Science Foundation

CPRA Exam Review Material/Study Guide

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Overview of NSF Structure and Operation

National Science Board (NSB)

The NSB was established by Congress in 1950, by President Harry Truman and along with the Director of NSF, constitutes the National Science Foundation. The twenty four member board provides oversight for, and establishes the policies of, the agency within the framework of applicable national policies set forth by the President and Congress. The director and all Board members serve six year terms. Each of them, as well as the NSF deputy director, is appointed by the President of the United States and confirmed by the U.S. Senate.

Overview of NSF Structure and Operation

Mission: To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.

Vision: Advancing discovery, innovation, and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering.

- **An independent Federal agency**
- Funds research and education in most fields of science and engineering
- Annual budget: Generally ~ $6 billion
- Receives ~50,000 proposals each year; ~11,000 funded

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." NSF is responsible for the overall health of science and engineering across all disciplines. In contrast, other Federal agencies support research focused on specific missions such as health or defense. The Foundation also is committed to ensuring the nation's supply of scientists, engineers, and science and engineering educators. NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to approximately 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 does not normally support technical assistance, pilot plant efforts, research requiring security classification, the development of products for commercial marketing, or market research for a particular project or invention. Research with disease-related goals, including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals, is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support.

Unlike many other federal agencies, NSF does not hire researchers or directly operate their own laboratories or similar facilities. Instead, they support scientists, engineers and educators directly through their own home institutions (typically universities and colleges). Similarly, they fund facilities and equipment such as telescopes, through cooperative agreements with research consortia that have competed successfully for limited-term management contracts

Catalog of Federal Domestic Assistance (With revision of Uniform Guidance now known as *Assistance Listings*)

NSF programs fall under the following categories in the latest Catalog of Federal Domestic Assistance (CFDA) issued by the Office of Management and Budget and the General Services Administration:

47.041 -- Engineering
47.049 -- Mathematical and Physical Sciences
47.050 -- Geosciences

47.070 -- Computer and Information Science and Engineering
47.074 -- Biological Sciences
47.075 -- Social, Behavioral and Economic Sciences
47.076 – Directorate for Stem Education
47.084 – Directorate for Technology, Innovation and Partnerships
47.078 – Polar Programs
47.079 -- Office of International Science and Engineering
47.083 -- Office of Integrative Activities

NSF Offices

Program Divisions/Offices are responsible for the scientific, technical and programmatic review and evaluation of proposals and for recommending that proposals be declined or awarded.

Division of Institution & Award Support (DIAS) - responsible for the

- development and implementation of proposal and award policies and procedures,
- clearance of NSF funding opportunities,
- advanced monitoring activities,
- cost analysis and award support,
- audit resolution,
- electronic award systems administration, and
- outreach to the external community.

The **Policy Office,** in the Division of Institution and Award Support, provides general proposal & award policy guidance for use by the NSF proposer and awardee community. In charge of the Proposal and Award Policies and Procedures Guide (PAPPG). Usually revised every year. Provides guidance on the interpretation of NSF policies and procedures within NSF's electronic proposal and award systems, as well as official clearance for NSF funding opportunities.

Cost Analysis and Pre-award (CAP) Branch specializes in determinations with regard to the allowability, allocability and reasonableness of costs either budgeted or claimed under NSF awards

The Resolution and Advanced Monitoring (RAM) Branch primary responsibilities include: audit resolution, advanced monitoring to assess grantees' administrative capability, performance, and compliance with award terms and conditions; and review of certain post-award adjustments to expenditures.

The **Division of Grants and Agreements (DGA**) is responsible for the award of all NSF grants and agreements recommended for support by NSF program offices. From pre-award through closeout, DGA conducts a variety of business, financial, and award administrative reviews to ensure compliance with award terms and conditions, NSF policies and procedures, and Federal rules and regulations.

Office of Inspector General (OIG): OIG is an independent oversight office that reports directly to the NSB and Congress. Each federal agency has an Office of Inspector General (OIG) that provides independent oversight of the agency's programs and operations. The OIG office is responsible for

promoting efficiency and effectiveness in agency programs and for preventing and detecting fraud, waste, and abuse. OIG also investigates allegations of research misconduct, such as plagiarism, falsification, or fabrication, involving researchers who request or receive NSF funding

NSF Organization – Research Areas NSF is divided into the following seven directorates that support science and engineering research and education. Each is headed by an assistant director and each is further subdivided into divisions like materials research, ocean sciences and behavioral and cognitive sciences.

1. Biological Sciences
2. Computer & Info Sciences & Engineering (CISE)
3. STEM Education)
4. Engineering (ENG)
5. Geosciences (GEO)
6. Mathematical & Physical Sciences (MPS)
7. Social, Behavioral & Economic Sciences (SBE)
   - **Divisions** within each Directorate
   - **Sections** within each Division
   - **Programs** within Sections
8. Technology, Innovation and Partnerships (TIP)

NSF Workforce

Consists of approximately 1,450 Federal employees (includes staff of the National Science Board Office and the Office of the Inspector General); 200 Non-Federal Intergovernmental Personnel Act (IPA) assignees coming from research institutions; 450 contract workers.

Program Directors - permanent and "rotators" Rotators are faculty who come from research institutions on a temporary basis). NSF offers a chance for scientists, engineers, and educators to join us as temporary program directors - called rotators. Rotators make recommendations about which proposals to fund; influence new directions in the fields of science, engineering, and education; support cutting-edge interdisciplinary research; and mentor junior research members.

Rotators are brought in as a Visiting Scientist, Engineer, and Educator (VSEE) or as an **Intergovernmental Personnel Act (IPA) assignee**. While rotators can come on temporary assignment under the IPA program for up to four years, most rotating assignments last one to two years.

Submission of Proposals by Former NSF Staff

For one year following separation from the Foundation, any communication with NSF by a former employee or IPA must be done through use of a "substitute negotiator." Unless a substitute negotiator has been designated by the proposer/grantee, the Division of Grants and Agreements (DGA) or the Division of Acquisition and Cooperative Support (DACS) will not process a new proposal with a former

employee or IPA as PI or co-PI. If it has been less than a year since a former employee separated from NSF or an IPA ended their appointment and they submit a proposal, documentation from the AOR needs to be included which designates a substitute negotiator for that proposal. The substitute negotiator must be from the same organization as the PI or co-PI for whom the negotiator is required. A co-PI on a new proposal should designate the PI as the substitute negotiator. This information should be submitted as a single copy document and uploaded in the "Additional Single Copy Documents" category.

The Proposal & Award Policies & Procedures Guide (PAPPG)

The Proposal & Award Policies & Procedures Guide (PAPPG) is comprised of documents relating to the Foundation's proposal and award process for the assistance programs of NSF. The PAPPG, in conjunction with NSF's Grant General Conditions, serves as the Foundation's implementation of 2 CFR § 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. If the PAPPG and NSF Grant Conditions are silent on a specific area covered by 2 CFR § 200, the requirements specified in 2 CFR § 200 must be followed.

- The PAPPG Guide does not apply to NSF contracts. For information relating to NSF contracts, consult the Guide to the NSF Contracting Process.

Resolution of Conflicting Conditions

Should there be any inconsistency between any special conditions contained in the award notice and the Grant General Conditions (GC-1), the special conditions in the award notice shall govern. Should there be any inconsistency between these Grant General Conditions (GC-1), any special conditions contained in award notice, and any NSF solicitation cited or included by reference in the notice of award, the matter should be referred to the cognizant NSF Grants Officer for guidance.

NSF and the Federal Demonstration Partnership (FDP)

Begun as an experiment in 1986 between five federal agencies (National Science Foundation, National Institutes of Health, Office of Naval Research, Department of Energy, and US Department of Agriculture) and the Florida State University System and the University of Miami to test and evaluate a grant mechanism utilizing a standardized and simplified set of terms and conditions across all participating agencies, the FDP has evolved into an organization of 10 federal agencies and more that 90 research institutions dedicated to finding efficient and effective ways to support research by maximizing resources available for research and minimizing administrative costs.

Originally called the Florida Demonstration Project 1986-1988, then the Federal Demonstration Project 1988-1996 and now the Federal Demonstration Partnership. There are Phases that run for a specific period of year that have specific goals to accomplish. Currently in Phase VI which formally began with an inaugural meeting September 11-12, 2015 in Washington, DC and will conclude September 30, 2020.

- FDP is a cooperative initiative among federal agencies and institutional recipients of federal funds.

- established to increase research productivity by streamlining the administrative process and minimizing the administrative burden on research administrators and principal investigators while maintaining effective stewardship of federal funds.
- NSF serves as the official host of participating agency documents relating to the FDP.

NSF Proposal Preparation and Submission

- **Research.gov** - Research.gov is the replacement for FastLane. Research.gov may be used for proposal preparation, submission, proposal file updates, and budgetary revisions.

Use Research.gov for the following:

- Submit proposals
- Check Proposal status
- Proposal Panel Reviews
- Project Reports
- Notifications and Requests
- Submit or manage payment transactions
- Program Income Reporting
- User Management

- Grants.gov may be used for proposal preparation and submission. The policy and procedural guidance contained in the NSF *Grants.gov Application Guide* pertains specifically to proposals submitted via Grants.gov.
- The Broad Agency Announcement Management (BAAM) site, is a document management system for submission of letters of intent, preliminary proposals, and full proposals in response to a National Science Foundation (NSF), Broad Agency Announcements (BAA).

A BAA is a funding opportunity method used by NSF for basic and applied research, scientific study, and experimentation. NSF can choose to fund proposals as either grants, cooperative agreements, or contracts. By using BAAs, NSF is seeking to engage new communities of scientists and engineers, including those who may be working beyond institutions of higher education, such as in industry, nonprofits and other organizations .Each BAA will specify the award type. BAAs are broad in their subject matter and focus on advancing science and increasing knowledge rather than acquiring specific products.

Preaward Proposal Submission

What does NSF Fund?

- Research Proposals
- Capacity building proposals
- Equipment proposals (Major Research Instrumentation, etc.)
- Major Research Equipment and Facilities Construction (rarely)
- Collections Development
- Conferences, symposia and workshops
- International travel proposals
- Facilitation proposals for Scientists and Engineers with Disabilities (FASED)
- Antarctic Artists and Writers' Program
- Joint solicitations with other agencies

Conference Proposals

It is NSF policy to foster harassment-free environments wherever science is conducted, including at NSF-sponsored conferences. Proposers are required to have a policy or code-of-conduct that addresses sexual harassment, other forms of harassment49, and sexual assault, and that includes clear and accessible means of reporting violations of the policy or code-of-conduct. The policy or code-of-conduct must address the method for making a complaint as well as how any complaints received during the conference will be resolved. This policy or code-of-conduct must be disseminated to conference participants prior to attendance at the conference as well as made available at the conference itself. Proposers should not submit the policy or code-of-conduct to NSF for review.

Safe and Inclusive Working Environments for Off-Campus or Off-Site Research

NSF's policy recognizes that a community effort is essential to eliminate sexual and other forms of harassment in science and to build inclusive scientific climates where people can learn, grow, and thrive. Accordingly, for each proposal that proposes to conduct research off-campus or off site44, the AOR must complete a certification45 that the organization has a plan in place for that proposal that describes how the following types of behavior will be addressed:

a. Abuse of any person, including, but not limited to, harassment, stalking, bullying, or hazing of any kind, whether the behavior is carried out verbally, physically, electronically, or in written form; or

b. Conduct that is unwelcome, offensive, indecent, obscene, or disorderly.

This plan should also identify steps the proposing organization will take to nurture an inclusive off-campus or off-site working environment, e.g., trainings; processes to establish shared team definitions of roles, responsibilities, and culture, e.g., codes of conduct; and field support, such as mentor/mentee support mechanisms, regular check-ins, and/or developmental events

Communications within team and to the organization should be considered in the plan, minimizing singular points within the communications pathway (e.g., a single person overseeing access to a single satellite phone), and any special circumstances such as the involvement of multiple organizations or the presence of third parties in the working environment should be taken into account.

Categories of Funding Opportunities

- **Program descriptions** The term "program description" includes broad, general descriptions of programs and activities in NSF Directorates/Offices and Divisions.
- **Program Announcements** (PAs) The term "program announcement" refers to formal NSF publications that announce NSF programs.
- **Program Solicitations** The term "program solicitation" refers to formal NSF publications that encourage the submission of proposals in specific program areas of interest to NSF. They generally are more focused than program announcements, and normally apply for a limited period of time.
- **Broad Agency Announcements (BAAs)** The term "Broad Agency Announcement" refers to a type of funding opportunity used by NSF for basic and applied research, scientific study, and experimentation. Unless otherwise specified, NSF can choose to fund proposals submitted in response to a BAA as grants, cooperative agreements, contracts, or other arrangements. BAAs are broad in their subject matter and focus on advancing science rather than acquiring specific products.
- **Dear Colleague Letters** (DCLs) are intended to provide general information to the community, clarify or amend an existing policy or document, or inform the NSF proposer community about upcoming opportunities. or special competitions for supplements to existing awards. They also may be used to announce NSF's interest in receiving proposals in specified topical areas f.

- **Limited Submission** Restricts the number of proposals an organization or PI may submit.

TYPES OF SUBMISSIONS

- **Concept Outlines -** Some NSF proposal types or funding opportunities may require submission of a concept outline prior to submission of a full proposal. A concept outline is a concise summary of a project idea that contains information about the prospective PI(s), potentially germane NSF organizational unit(s), project title, keywords, and brief narrative descriptions of the idea and fit to any special criteria required for the proposal type or funding opportunity. The

primary purposes of requiring a concept outline are to ensure that the concept being proposed by the prospective PI is appropriate for the proposal type/funding opportunity, and to help reduce the administrative burden associated with submission of a full proposal. Concept outlines are submitted either by email to a designated address or via the Program Suitability and Proposal Concept Tool (ProSPCT).

- **Letters of Intent (LOI) -** An LOI is not a binding document. The predominant reason for its use is to help NSF program staff gauge the size and range of the competition, enabling earlier selection and better management of reviewers and panelists.

- **Preliminary Proposals** Some NSF program solicitations require or request submission of a preliminary proposal in advance of submission of a full proposal. The three predominant reasons for requiring submission of a preliminary proposal are to:
  - reduce the proposers' unnecessary effort in proposal preparation when the chance of success is very small. This is particularly true of exploratory initiatives when the community senses that a major new direction is being identified, or competitions that will result in a small number of awards;
  - increase the overall quality of the full submission;
  - and assist NSF program staff in managing the review process and in the selection of reviewers.

- **Full Proposal –** standard proposal submission that meets the PAPPG requirements unless given specific instruction in the funding opportunity.

Categories of Proposers:

- **Institutes of higher Education (IHEs) Universities and Colleges** Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US

- **Non-profit, Non-academic Organizations** Independent museums, observatories, research laboratories, professional societies and similar organizations located in the US

- **Tribal Governments**

- **For-profit Organizations** - US commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

- **State and Local Governments** - State educational offices or organizations and local school districts may submit proposals intended to broaden the impact, accelerate the pace, and increase the effectiveness of improvements in science, mathematics and engineering education in both K-12 and post-secondary levels

- **Unaffiliated Individuals** - Unaffiliated individuals in the U.S. and unaffiliated U.S. citizens **are not** eligible to receive direct funding support from NSF.

- **Foreign organizations** - NSF rarely provides support to foreign organizations.

NSF will consider proposals for cooperative projects involving U.S. and foreign organizations, provided support is requested only for the U.S. portion of the collaborative effort.

In cases however, where the proposer considers the foreign organization or foreign individual's involvement to be essential to the project and proposes to provide funding through the NSF budget (via a subaward or consultant arrangement), the proposer must justify the benefit to U.S. research and education. The justification must include, at minimum:

- Why support from the foreign counterpart's in-country resources is not feasible;

- Why the foreign organization or foreign individual can carry out the activity more effectively than a U.S. organization or U.S. individual;

- What unique expertise, organizational capability, facilities, data resources, and/or access to a geographic location not generally available to U.S. investigators the foreign organization or foreign individual brings to the project; and

- What significant science and engineering education, training, or research opportunities the foreign organization or foreign individual offers to the U.S.

Such information must be included in any proposal to NSF, including new and renewal proposals. The information must be included in the project description section of the proposal. The box for "Funding of a Foreign Organization or Foreign Individual" must be checked on the Cover Sheet if the proposal includes funding for a foreign organization or foreign individual.

Not Eligible to Submit Proposals

The Chips & Science Act of 2022 prohibits participation in any foreign talent recruitment program by personnel of Federal research agencies and prohibits participation in a malign foreign talent recruitment program by covered individuals involved with research and development awards from those agencies.

Individuals who are a current party to a Malign Foreign Talent Recruitment Program are not eligible to serve as a senior/key person on an NSF proposal or any NSF award made after May 20, 2024.

Malign foreign talent recruitment programs are programs, positions or activities sponsored by a country of concern (China, Iran, North Korea or Russia) or by certain academic institutions.

Senior/Key Personnel must certify prior to proposal submission and annually for the duration of the award. Certifications made in SciENcv on biosketch and current and pending support.

When to Submit Proposals

1. **Target dates:** dates after which proposals will still be accepted, although they may miss a particular panel or committee meeting

2. **Deadline dates:** dates after which proposals will not be accepted or will be returned without review by NSF.
3. **Submission windows:** designated periods of time during which proposals will be accepted for review by NSF. It is NSF's policy that the end date of a submission window converts to, and is subject to, the same policies as a deadline date.

Proposal Programs

Early-Concept Grants for Exploratory Research (EAGER) Exploratory work in its *early stages* on untested, but potentially transformative, research ideas or approaches. "High Risk - High Payoff". Radically different approaches, new expertise, or novel disciplinary or interdisciplinary perspectives. Budget consistent with project scope and existing programmatic activities (up to $300K for 2 years). Program Officer approval needed. PI needs to convince **appropriateness** for EAGER submission vs. "regular" NSF proposals. Project description limited to no more than 8 pages.

Grants for Rapid Response Research (RAPID) Rapid release of funds and expedited merit review: *having a severe urgency with regard to availability of, or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events.*

Requirements:

- *Program Manager approval*
- *Budget consistent with project scope and existing programmatic activities (up to $200K for 1 year)*
- *Require internal review/with optional external input*
- *Up to 5-page project description*

Research Advanced by Interdisciplinary Science and Engineering RAISE is a type of proposal that may be used to support bold, interdisciplinary projects whose:

- Scientific advances lie in great part outside the scope of a single program or discipline, such that substantial funding support from more than one program or discipline is necessary.
- Lines of research promise transformational advances.
- Prospective discoveries reside at the interfaces of disciplinary boundaries that may not be recognized through traditional review or co-review.

Prospective PIs must receive approval to submit a proposal from at least two NSF Program Officers, in intellectually distinct programs, whose expertise is most germane to the proposal topics. Requests may be for up to $1,000,000 and up to five years in duration.

Ideas Lab – funding mechanism: An "Ideas Lab" is a new merit review strategy being used at the National Science Foundation to address grand challenges in Science Technology Engineering and

Mathematics (STEM) research and education. The Ideas Lab process is modeled on the "Ideas Factory" program developed by the Engineering and Physical Sciences Research Council (EPSRC) of the United Kingdom. The Ideas Lab process starts with submission of a brief application to participate in the Ideas Lab, indicating a Principal Investigator's interest in and preliminary ideas regarding the specific Ideas Lab topic. A diverse sub-set of participants from a range of disciplines and backgrounds will be selected from the submitted applications by NSF and will be brought together in an intensive, interactive and free-thinking environment, where participants immerse themselves in a collaborative dialog in order to construct bold and innovative approaches. In the IDEAS Factory model, the five-day Ideas Lab culminates with the development of multidisciplinary collaborative concepts by teams of participants; a sub-set of these teams are then invited to submit full proposals.

The implementation of the Ideas Lab mechanism is a four-stage process:
Stage 1: Selection of Panelists
Stage 2: Selection of Participants
Stage 3: Ideas Lab
Stage 4: Review and recommendation of full proposals

Grant Opportunities for Academic Liaison with Industry (GOALI) Proposal - is a type of proposal that seeks to stimulate collaboration between academic research institutions and industry. At least one industrial co-PI must be listed on the Cover Sheet at the time of submission although the industrial participant cannot use or receive any NSF funds. A signed university-industry agreement on IP (including publication and patent rights) must be submitted prior to issuance of an award.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) Persons with disabilities eligible for facilitation awards include PIs, other senior personnel, and graduate and undergraduate students.

Research Opportunity Supplemental Funding Requests for Primarily Undergraduate Institutions (ROA-PUI)

Enables a faculty member (or equivalent), to pursue research as part of a collaborative research team as a visiting scientist at another NSF-supported institution. Either the visitor's home organization, or the host organization, or both, must be an eligible Primarily Undergraduate Institution (PUI) of higher education. Is intended to increase or maintain a PUI faculty member's research capability and effectiveness. A formal request for an ROA supplement must be made by the host institution of the NSF-supported PI who wishes to host a faculty member from a PUI institution.

Graduate Research Fellowship Program (GRFP) :- Individual awards, but funding flows through the institution. The purpose of the NSF Graduate Research Fellowship Program (GRFP) is to help ensure the vitality and diversity of the scientific and engineering workforce of the United States. The program recognizes and supports outstanding graduate students who are pursuing research-based master's and doctoral degrees in science, technology, engineering, and mathematics (STEM) and in STEM education. Two types of fellowships include Graduate Research Fellowships and Postdoctoral Fellowships

Crosscutting Program Solicitations:

- **Cross-Directorate Programs** (CAREER, MRI, etc.)

- CAREER - Faculty Early Career Development Program
- MRI - Major Research Instrumentation Program -supporting the acquisition of major state-of-the-art instrumentation

- IUCRC - The Industry–University Cooperative Research Centers IUCRC program provides a structure for academic researchers to conduct fundamental, pre-competitive research of shared interest to industry and government organizations. These organizations pay membership fees to a consortium so that they can collectively envision and fund research, with at least 90% of Member funds allocated to the direct costs of these shared research projects.

- REU - The Research Experiences for Undergraduates (REU) program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation.

- **Centers** (Engineering Research Centers ERCs, etc.)

Contents of Standard Research Proposal

Proposal Single-Copy Documents for "NSF Use Only"

a) Authorization to deviate from NSF proposal preparation requirements

b) List of Suggested Reviewers or reviewers Not to include

c) Proprietary or privileged information

d) Proposal certifications

e) Collaborators and other affiliations

The following information regarding collaborators and other affiliations (COA) must be separately provided for each individual identified as senior personnel on the project.

There are five separate categories of information which correspond to the five tables in the COA template:

COA template Table 1: List the individual's last name, first name, middle initial, and organizational affiliation in the last 12 months.

COA template Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

COA template Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

- The individual's Ph.D. advisors; and
- All of the individual's Ph.D. thesis advisees.

COA template Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

- Co-authors on any book, article, report, abstract or paper with collaboration in the last 48 months (publication date may be later); and
- Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.

COA template Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief must list the entire editorial board.

- Editorial Board: List name(s) of editor-in-chief and journal in the past 24 months; and
- Other co-Editors of journal or collections with whom the individual has directly interacted in the last 24 months.

Major Proposal Components – for standard proposals

a. Cover Sheet
b. Project Summary
c. Table of Contents
d. Project Description
e. References Cited
f. Budget and Budget Justification
g. Facilities, Equipment and Other Resources
h. Senior Personnel Documents
    (i) Biographical Sketch(es)
    (ii) Current and Pending Support
    (iii) Collaborators and Other Affiliations (see also PAPPG Chapter II.D.1 for additional information on submission of single copy documents
    (IV) Synergistic Activities

i. Special Information and Supplementary Documentation
    (i) Mentoring Plan for Postdoctoral Scholars and Graduate Students (if applicable)
    (ii) Data Management Plan

Collaborative Proposals –Supported by Research.gov

- Proposals from 2+ institutions linked together in Research.gov with one lead organization

- Each institution is awarded funds separately by NSF, but work together as a common unit on research
- Lead organization will link proposals from collaborative institutions by using a temporary proposal #
- Lead organization officially submits proposal first, then collaborators submit online
- ***IMPORTANT: All components of the collaborative proposal must meet any established deadline date, and failure to do so may result in the entire collaborative proposal being returned without review***
- Alternative method: Lead institution receives the entire award and then issues sub grants to collaborator for their portion of the work.

Simultaneous submission of proposals allows multiple organizations to submit a unified set of certain proposal sections, as well as information unique to each organization. If funded, each organization bears responsibility for a separate award.

Lead Organization	**Non-Lead Organization**
Cover Sheet	Cover Sheet
Project Summary	Table of Contents
Table of Contents	Biographical Sketches
Project Description	Current and Pending support
References Cited	Budget / Budget Justification
Biographical Sketches	Facilities, Equipment and other Resources
Current and Pending support	Single Copy Documents
Synergistic Activities	Synergistic Activities
Budget / Budget Justification	
Facilities, Equipment and other Resources	
Special Information and Supplementary Documentation–Data Management Plan and etc.	
Single Copy Documents	

Project Summary – (1 page)

- A self-contained "thumbnail sketch" of the project
- Should stress significance and innovation
- Summarize project overall goal(s) objectives
- List methods to be employed
- Identify expected outcomes

- Separate input sections:
    1) Overview
    2) Intellectual merit
    3) Broader impacts

Project Description (15 pages)

- Detailed description of the project's overall purpose, specific objectives and expected significance
- Relation to longer-term goals of researcher(s)
- Contribution to present state of knowledge
- Results from prior NSF support, if any (5 pp. max.) – an award with an end date in the past 5 years or any current funding including any no cost extensions
- Clear description of experimental methods and procedures
- Detailed work plan, with major tasks and timelines
- Section labeled "Broader Impacts"
- Plans for dissemination of outcomes

References

- This section is required
- Include: Author(s), article and journal title, vol. #, page numbers, year of publication
- If available electronically, include URL
- Follow an accepted scholarly format
- Do NOT include commentary parenthetical to narrative!
- No page limit

Biographical Sketches

Note: Mandate to use SciENcv only for preparation of the biographical sketch.

- Approved format for creating biographical sketches are: SciENcv: Science Experts Network Curriculum Vitae .
- Required for Senior Personnel (PI's, co-PI's and Faculty Associates)

- **Do not submit any personal information in the biographical sketch.** This includes items such as: home address; home telephone, fax, or cell phone numbers; home e-mail address; driver's license number; marital status; personal hobbies; and the like.
- No Page limit, NSF format required:
    - Professional preparation - A list of the individual's undergraduate and graduate education and postdoctoral training
    - Appointments - should include any titled academic, professional, or institutional position, whether or not remuneration is received and whether full-time, part-time, or voluntary (including adjunct, visiting, or honorary).
    - Products - A list of: (i) up to five products most closely related to the proposed project; and (ii) up to five other significant products, whether or not related to the proposed project.

Other Personnel

For the personnel categories listed below, the proposal also may include information on exceptional qualifications that merit consideration in the evaluation of the proposal. Such information should be clearly identified as "Other Personnel" biographical information and uploaded as a single PDF file in the Other Supplementary Documents section of the proposal.

(a) Postdoctoral associates

(b) Other professionals

(c) Students (research assistants)

Synergistic Activities - A document of up to one page that lists five distinct examples that demonstrate the broader impact of the individual's professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation. (This will be removed from biosketch beginning May 2024 and will be a separate Senior Personnel document.)

Budget

Each proposal must contain a budget for each year of support requested. The budget justification must be no more than five pages per proposal. For proposals that contain a subaward(s), each subaward must include a separate budget justification of no more than five pages. **Unless required by NSF, inclusion of voluntary committed cost sharing is prohibited.** *Voluntary committed cost sharing* means cost sharing specifically pledged on a voluntary basis in the proposal's budget or the Federal award on the part of the non-Federal entity and that becomes a binding requirement of Federal award." As such, to be

considered voluntary committed cost sharing, the amount must appear on the NSF proposal budget and be specifically identified in the approved NSF budget. Mandatory cost sharing will only be required for NSF programs when explicitly authorized by the NSF Director, the NSB, or legislation. The NSF budget form is known as NSF1030 and any required cost sharing is shown on Line M..

Budget Notes – Salary Compensation

As a general policy, NSF limits the salary compensation requested in the proposal budget for senior personnel to no more than two months of their Institutional Base Salary (IBS) salary in any one year. This limit includes salary compensation received from all NSF-funded grants. This effort must be documented in accordance with 2 CFR § 200, Subpart E. If anticipated, any compensation for such personnel in excess of two months must be disclosed in the proposal budget, justified in the budget justification, and must be specifically approved by NSF in the award notice budget.

Under normal rebudgeting authority, an awardee can internally approve an increase or decrease in person months devoted to the project after an award is made, even if doing so results in salary support for senior personnel exceeding the two month salary policy. No prior approval from NSF is necessary as long as that change would not cause the objectives or scope of the project to change. NSF prior approval is necessary if the objectives or scope of the project changes.

Per NSF FAQ - The NSF 2-Month Limitation on Salary applies only to the proposed budget. By this policy, NSF intends to limit the amount of funds institutions request from NSF, and therefore the amount NSF will award. However, NSF allows institutions to rebudget award funds within the terms of the award in order to pay individuals in excess of the 2-month limitation.

Participant Support

This budget category refers to direct costs for items such as stipends or subsistence allowances, travel allowances, and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with NSF-sponsored conferences or training projects.

Speakers and trainers generally are not considered participants and should not be included in this section of the budget. However, if the primary purpose of the individual's attendance at the conference is learning and receiving training as a participant, then the costs may be included under participant support. If the primary purpose is to speak or assist with management of the conference, then such costs should be budgeted in appropriate categories other than participant support.

Note: NSF approval must be obtained to rebudget participant support costs to another category.

Other Direct Costs - include

- **Materials and Supplies (including Costs of Computing**
- **Devices) Publication/Documentation/Dissemination**
- **Consultant Services (also referred to as Professional Service Costs)**
- **Computer Services**
- **Subawards**

- **Other -** Examples include:
    - Contracts for the purpose of obtaining goods and services for the proposer's own use
    - Incentive payments, for example, payments to human subjects or incentives to promote completion of a survey, should be included on line G6 of the NSF budget. Incentive payments should be proposed in accordance with organizational policies and procedures. Indirect costs should be calculated on incentive payments

Current & Pending Support

Note: Mandate to use SciENcv only for the preparation of current and pending (other) support information.

NSF uses the information submitted in the Current and Pending Support section to assess the capacity of the individual to carry out the research as proposed as well as to help assess any potential overlap/duplication with the project being proposed.

Must be separately provided through use of an **NSF-approved** format, for each individual designated as senior personnel on the proposal.

Approved formats for creating current & pending support are: SciENcv: Science Experts Network Curriculum Vitae and NSF Fillable PDF

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value. Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual.

Not reported are gifts, Organizational start-up packages provided to the individual from the proposing organization are not required to be reported. Start-up packages from other than the proposing organization must be reported. Faculty academic year salary is not considered current and pending support in this context.

Reporting items

- Project/proposal title
- Source of support
- Primary Place of performance
- Project/Proposal start and end date
- Total award amount including indirect costs
- Person months per year committed to the project

In-Kind Contributions

In this section, disclose ALL in-kind contributions with an estimated dollar value of $5000 or more **and** that require a commitment of the individual's time. Provide a brief statement of the overall objectives of the in-kind contribution(s).

An in-kind contribution is a non-cash contribution provided by an external entity that directly supports the individuals' research and development efforts.

An in-kind contribution may include but is not limited to: real property; laboratory space; equipment; data or data sets; supplies; other expendable property; goods and services; employee or student resources.

In-kind contributions with an estimated value of less than $5000 need not be reported.

Facilities, Equipment and Other Resources

- Used to assess the adequacy of the organizational resources available to complete the project successfully
- Must describe only those resources that are directly applicable
- The description should be narrative in nature and must not include any quantifiable financial information.
- Although these resources are not considered voluntary committed cost sharing as defined in 2 CFR § 200.99, the Foundation **does expect** that the resources identified in the Facilities, Equipment and Other Resources section will be provided, or made available, should the proposal be funded.

Special Info and Supplementary Documentation

- Included if needed for special circumstances (Performing part of project off campus or in foreign countries, environmental impacts, etc.)
- **Mentoring Plan** – (As of May 2024 this will also be required if **postdoctoral scholars or graduate students** are supported on project). Each proposal that requests funding to support graduate students or postdoctoral researchers must upload under "Mentoring Plan" in the supplementary documentation section of Research.gov. In no more than one page a description of the mentoring activities that will be provided for such individuals.. Examples of mentoring activities include but are not limited to: career counseling; training in preparation of proposals, publications and presentations; guidance on ways to improve teaching and mentoring skills; guidance on how to effectively collaborate with researchers from diverse backgrounds and disciplinary areas; and training in responsible professional practices.

Individual Development Plans for Postdoctoral Scholars or Graduate Students

Requirement for postdoctoral scholars or graduate students who receive substantial NSF support must have an Individual Development Plan which is required to be updated annually. NSF defines

"substantial support" as an individual that has received one person month or more during the annual reporting period under the NSF award. The plan maps the educational goals, career exploration, and professional development of the individual. A Certification that each graduate student or postdoctoral scholar has a plan is completed by the PI or Co-PI in Research.gov as part of the annual reporting process.

Data Management Plan

Government-wide emphasis on community access to data supports substantive push toward more open sharing of research data. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans.

Elements of a Data Management Plan

Proposals must include a supplementary document of no more than two pages labeled "Data Management Plan."

1. the **types** of data, samples, physical collections, software, curriculum materials, and other materials to be produced
2. the **standards** to be used for data and metadata format and content
3. **policies** for **access** and **sharing** including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements
4. **policies** and provisions for **re-use**, **re-distribution**, and the **production** of derivatives, and
5. plans for **archiving** data, samples, and other research products, and for preservation of access to them

Potential Restrictions on Data Sharing – data involving the following area may be restricted from being shared

- Intellectual Property
- Industry Collaboration
- Export-controlled technologies
- Classified research
- State public records statutes
- IRB – Institutional Review Board requirements
- HIPAA – Health Insurance Portability and Accountability Act
- FDA – Food and Drug Administration

Documenting collaborative arrangements, Letters of collaboration should be limited to stating the intent to collaborate and should not contain endorsements or evaluation of the proposed project. The recommended format for letters of collaboration is as follows:

- *"If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal."*

- While letters of collaboration are permitted, unless required by a specific program solicitation, letters of support should not be submitted as they are not a standard component of an NSF proposal.
- Not to be used as an appendix

Appendix - May be included only if a deviation from guidelines has been requested and authorized by NSF!

Seeking and Obtaining Tribal Approval for Proposals that May Impact Tribal Resources or Interests

If a proposal will be conducting research on Tribal Land and/or the proposal may impact Tribal resources or Interests one must take the following required actions:

a. Seek guidance from the potentially impacted Tribal Nation(s) regarding which activity/activities require(s) review and prior approval from an authorized designee(s) of the Tribal Nation(s); and

b. Based on the guidance received, submit a written request to the relevant Tribal Nation(s), for approval to carry out the proposed activity(ies) that require(s) Tribal Nation review and approval.

c. Check the box on the Cover Sheet entitled “Potential Impacts on Tribal Nations.

d. Include **at least one** of the following:

(i) a copy of the written request to the relevant Tribe(s) to carry out any proposed activity/activities that may require prior approval from the Tribal Nation(s);

(ii) written confirmation from the Tribal Nation(s) that review and approval is not required; or

(iii) a copy of a document from the relevant Tribal Nation(s) that provides the requisite approval.

All such documentation must be uploaded into "Other supplementary documents" in Research.gov. If only (i) is provided, the proposer will still be required to submit either (ii) or (iii) before NSF will make an award decision.

Proposal Review and Awarding Process

Proposal Preparation

1 **Opportunity Announced.** All funding opportunities are announced on the NSF website and Grants.gov. Program Descriptions, Program Announcements and Program Solicitations are mechanisms used by NSF to generate proposals. Proposers have a minimum of 90 days from NSF's announcement of a funding opportunity to prepare and submit a proposal. Unsolicited proposals to specific NSF programs may be submitted at any time.

2 **Proposal Submitted.** The PAPPG is the source for guidance on preparing and submitting a proposal to NSF. The PAPPG details formatting and submission requirements. The proposing organization submits the proposal to NSF via the NSF Research.gov or via grants.gov.

3 **Proposal Received.** Proposals are received by the NSF Proposal Processing Unit and are assigned to the appropriate program for acknowledgement and, if they meet NSF requirements, for review. A proposal may be returned without review if it does not meet NSF proposal preparation requirements, such as page limitations, formatting instructions, and electronic submission, as specified in the PAPPG or program solicitation. The PAPPG identifies all of the reasons for which a proposal may be returned without review.

PHASE II – PROPOSAL REVIEW AND PROCESSING – 6 MONTHS

4 **Reviewers Selected.** Reviewers are selected based on their specific and/or broad knowledge of the science and engineering fields; their broad knowledge of the infrastructure of the science and engineering enterprise, and its educational activities; and to the extent possible, diverse representation within the review group. Sources of reviewers can come from the program officer's knowledge of the research area; references listed in the proposal; recent professional society programs; computer searches of science and engineering journal articles related to the proposal; reviewer recommendations included in proposal or sent by email. Proposers are invited to suggest persons they believe are especially well qualified to review the proposal, as well as identify persons they would prefer not review the proposal.

5 **Peer Review.** All NSF proposals are reviewed through use of the two NSB-approved merit review criteria: Intellectual Merit and Broader Impacts. Some solicitations may have additional review criteria. External reviewers' analyses and evaluation of the proposal provide information to the NSF Program Officer in making a recommendation regarding the proposal.

6 **Program Officer Recommendation.** After scientific, technical and programmatic review, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be recommended for an award or declined for funding. Due to the large number of proposals received, the review and consideration process can take up to six months.

7 **Division Director Review.** If the decision is made to decline the award, the organization is notified and review information is available in the Research.gov System. If the decision is to award, the recommendation is submitted to a Grants & Agreements Officer in the Division of Grants and Agreements (DGA).

PHASE III – AWARD PROCESSING – 30 DAYS

8 **Business Review.** The Grants and Agreements Officer in the Division of Grants and Agreements (DGA) conducts a review of business, financial, and policy implications.

9 **Award Finalized.** The award itself is comprised of an award notice, budget, proposal, applicable NSF conditions, and any other documents or requirements incorporated by reference into the agreement. Each NSF award notice specifically identifies certain conditions that are applicable to, and become part of, that award.

Merit Review Criteria

- What is the **intellectual merit** of the proposed activity?
- What are the **broader impacts** of the proposed activity?
- **Program-specific criteria** may be listed in the program announcement

Intellectual Merit

- How important is the proposed activity to **advancing knowledge and understanding** within its own field or across different fields?
- How **well qualified** is the proposer to conduct the project?
- To what extent does the proposed activity explore **creative, original, or POTENTIALLY TRANSFORMATIVE CONCEPTS***?
- How **well conceived and organized** is the proposed activity?
- Is there sufficient **access to necessary resources**?

Transformative Research

Involves ideas, **discoveries**, or **tools** that radically change our understanding of an important existing scientific or engineering concept or **educational practice** or leads to the creation of a new paradigm or field of science, engineering, or **education**. Such research challenges current understanding or provides pathways to new frontiers. **Characteristics of transformative research are that it:**

- Challenges conventional wisdom
- Leads to unexpected insights that enable new techniques or methodologies, and/or
- Redefines the boundaries of science, engineering, or education

Broader Impacts

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

NSF Review of Merit Review Criteria

Implications for broader impacts, and the emergence of national goals…

- Increased economic competitiveness of the United States
- Development of a globally competitive STEM workforce
- Increased participation of women, persons with disabilities, and underrepresented minorities in STEM
- Increased partnerships between academia and industry
- Improved pre K-12 STEM education and teacher development
- Improved undergraduate STEM education
- Increased public scientific literacy and public engagement with science and technology
- Increased national security
- Enhanced infrastructure for research and education, including facilities, instrumentation, networks and partnerships

Five Review Elements

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 institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

Postaward Administration

Types of Awards

- **Standard grants** means a type of grant in which NSF agrees to provide a specific level of support for a specified period of time with no statement of NSF intent to provide additional future support without submission of another proposal
- **Continuing Grant** means a type of grant in which NSF agrees to provide a specific level of support for an initial specified period of time, usually a year, with a statement of intent to provide additional support of the project for additional periods, provided funds are available and the results achieved warrant further support.
- **Supplemental Support** In unusual circumstances, small amounts of supplemental funding and up to six months of additional support may be requested to assure adequate completion of the original scope of work.

  Research Experiences for Undergraduates (REU) The REU program seeks to expand undergraduate student participation in all kinds of research. Support for undergraduate students involved in carrying out research under NSF awards should be included as part of the research proposal itself instead of as a post-award supplement to the research proposal, unless such undergraduate participation was not foreseeable at the time of the original proposal.

  A request for an REU Supplement may be submitted in either of two ways: (1) Proposers may include an REU Supplement activity as a component of a new (or renewal) research proposal to NSF. For guidance, contact the program officer who manages the research program to which the proposal would be submitted. (2) Investigators holding an existing NSF research award may submit a post-award request for supplemental funding.

  Undergraduate student participants in either REU Sites or REU Supplements must be U.S. citizens, U.S. nationals, or permanent residents of the United States.

  Recovery of indirect costs (F&A) is prohibited on Participant Support Costs in REU Site proposals and REU Supplemental funding requests.

- **Cooperative agreements** (1) Is used to enter into a relationship the principal purpose of which is to transfer anything of value from NSF to the grantee to carry out a public purpose and not to acquire property or services for NSF's direct benefit or use; (2) Is distinguished from a grant in that it provides for substantial involvement between NSF and the grantee in carrying out the activity contemplated by the NSF award.
- **Contracts** used when the purpose is to acquire property or services for NSF's direct benefit or use

Public Access to Copyrighted Material

NSF's policy on public access to copyrighted material (Public Access Policy) reflects the Foundation's commitment to making certain that, to the extent possible, the American public, industry and the scientific community have access to the results of federally funded scientific research. Pursuant to this policy, awardees must ensure that articles in peer-reviewed scholarly journals and papers in juried conference proceedings:

- are deposited in a public access compliant repository (as identified in the Public Access Policy); are available for download, reading, and analysis within 12 months of publication;
- possess a minimum set of machine-readable metadata elements as described in the Public Access Policy; and
- are reported in annual and final reports with a persistent identifier.

Responsible and Ethical Conduct of Research (RECR)

The requirement specified in Section 7009 of the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Act (42 USC 1862o–1), as amended, to have a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to faculty and other senior personnel who will be supported by NSF to conduct research will go into effect for new proposals submitted or due on or after July 31, 2023.

Statutory Requirement: "The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project." While training plans are not required to be included in proposals submitted to NSF, institutions are advised that they are subject to review upon request.

Such training must include mentor training and mentorship.

Research Security

NSF is committed to safeguarding the integrity and security of science while also keeping fundamental research open and collaborative. NSF requires the following post-award updates to current and pending support information after issuance of an NSF award:
1. Post-award Disclosure of Current Support and In-Kind Contribution Information
If an organization discovers that a PI or co-PI on an active NSF award failed to disclose current support or in-kind contribution information as part of the proposal submission process the AOR must submit the information within 30 calendar days of the identification of the undisclosed current support or in-kind contribution through use of the Notification and Request Module in Research.gov.

2. Update of Current Support in Annual and Final Project Reports
PIs and co-PIs on active NSF awards must indicate if there has been a change in active other support since submission of the proposal, or the last reporting period in their annual and final project report.

Research Misconduct - https://www.nsf.gov/oig/regulations/

- means “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.”
    - Fabrication is “making up data or results.”
    - Falsification is “manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.”
    - Plagiarism is “the appropriation of another person’s ideas, processes, results, or words without giving appropriate credit.”
- The Office of Inspector General oversees investigations of research misconduct

Dual-Use Research of Concern (DURC)

NSF is committed to preserving the benefits of life sciences research while minimizing the risk of misuse of the knowledge, information, products, or technologies provided by such research. The purpose to NSF’s implementation of this Policy is to clarify grantee expectations about NSF-funded research with certain high-consequence pathogens and toxins with potential to be considered dual use research of concern. Grantees are responsible for monitoring the research progress and for implementation of all appropriate biosafety and biosecurity risk mitigation measures including compliance with all applicable laws and regulations related to that implementation, including the Policy specified above.