NSF CAREER PROPOSAL GUIDE

Information in this document is provided to help guide writing of a CAREER proposal. It should not substitute for full review of NSF Solicitation and relevant PAPPG sections by proposal writers; review further details in each of these documents.

CAREER AT A GLANCE

Deadline

July 26, 2023 (5:00 p.m. submitter's local time)

PI Limitations

A Principal Investigator (PI) may submit only one CAREER proposal per annual competition. A Principal Investigator may not participate in more than three CAREER competitions. No co-PIs are permitted.

Timeframe

5 years

Submission

Submitted by TTU Office of Research Services (ORS) on behalf of faculty via Research.gov.

Instructions

- **Solicitation NSF 22-586** (check site for possible 23- version update) https://www.nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=503214&ods_key=nsf22586
- **Proposal and Award Policies and Procedures Guide (PAPPG) (NSF 23-1)** https://nsf-gov-resources.nsf.gov/2022-10/nsf23_1.pdf
- See PAPPG Chapter II.D.2 for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the PAPPG instructions. -NSF 22-586

Minimum Budget

Minimum $400,000 total, including indirect costs. Contact Program Officers for budget expectations.

BIO, ENG, OPP Divisions exception:

Minimum $500,000, including indirect costs. Contact Program Officers for budget expectations.

CISE:

Expected to support one month of PI salary per year, one graduate student per year, and two trips per year (see Solicitation for additional information, V.B.)

Eligibility

Requirements as of application deadline:

- ✓ 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;
- ✓ 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.)

Timeline

Proposal Submission Timeline (22-586)
(particularly useful for those new to NSF or new to Research.gov)
NSF Recommendation: Submit by 7 days ahead of proposal submission deadline.
https://www.research.gov/common/attachment/Common/Career_deadline.pdf (fyi, TTU has a SAM UEI)

PREPARATION

Check Credentials

Ensure you are registered with NSF and have access to Research.gov. Contact TTU Office of Research Services with questions.

Get to know NSF and its Directorates and Offices

NSF 22-068, Leading the World in Discovery and Innovation, STEM Talent Development and the Delivery of Benefits from Research: NSF Strategic Plan for Fiscal Years 2022-2026 https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf22068

Priorities: *Statement by the NSF Director on the President's Fiscal Year 2024 Budget*
https://beta.nsf.gov/news/statement-nsf-director-presidents-fiscal-year-2024?utm_medium=email&utm_source=govdelivery

NSF Directorates, Divisions, and Offices organization https://www.nsf.gov/staff/orglist.jsp Each Directorate includes a series of Programs, which can be accessed via the Divisions' homepages.

- "For assistance in determining which Program(s) to choose, refer to the NSF Guide to Programs, which provides descriptions of NSF research-supporting programs." -from Solicitation https://beta.nsf.gov/funding/opportunities

(If investigating NSF, don't just look at program pages. It is possible NSF has a topic page {e.g., Robotics, AI, Quantum} that summarizes what NSF is doing in that area and guides you to related programs. Also check out "Dear Colleague Letters" under Directorates, often under Announcements or News.)

List of available CAREER-related Programs: Go to Research.gov. Go to *Prepare & Submit Proposals*, choose *Demo Site: Prepare Proposals*. Login. Go to *Prepare New*, choose *Full Proposal*. Choose or enter CAREER's Funding Opportunity Number. Go to *Select Where to Apply*. To find Programs available, *Select Directorate/Office*, *Select Division*, then *Select Program.*

Review the Faculty Early Career Development Program (CAREER)

https://beta.nsf.gov/funding/opportunities/faculty-early-career-development-program-career
The NSF CAREER webpage provides information about the CAREER award, including the following:

- *Program contacts*, *CAREER Directorate and Division Contacts* links
- *Browse projects funded by this program* link (titles, abstracts, programs, funding, etc.). Also see ADDITIONAL RESOURCES.
- *NSF Organization(s)*: Directorates & Offices links
- Solicitation, 22-586, link

Understand CAREER Program

NSF 101: Four tips for applying to NSF's CAREER program
https://beta.nsf.gov/science-matters/nsf-101-four-tips-applying-nsfs-career-program

Write a Concept Paper

The concept paper focuses your ideas into a concise document that can be shared with Program Officers.

TTU RESOURCE: "CRAFTING A CONCEPT PAPER FOR FUNDED RESEARCH"
https://www.depts.ttu.edu/research/protected/NSFCAREER.php

Contact the Program Officer

NSF 101: 5 tips on how to work with an NSF program officer
https://beta.nsf.gov/science-matters/nsf-101-5-tips-how-work-nsf-program-officer

TTU RESOURCE: Program Officer Assistance https://www.depts.ttu.edu/research/ordc/program-officer-assistance.php

If you do not receive a response, email again. Put CAREER in subject line. Check website to ensure person is still at NSF. Contact Division director CAREER contact if get no answer at all.
-from NSF CAREER Webinar 5/10/2022 https://www.nsf.gov/news/news_summ.jsp?cntn_id=300464&org=NSF&from=news

Contact TTU Office of Research Services

https://www.depts.ttu.edu/research/ors/
Notify of intent to submit well in advance of deadline.
Send Solicitation.
Notify of deadline.
Notify of any collaborations (consultant, subaward, etc.).
Notify of any special budget considerations.
Notify of intended NSF Directorate / Division / Program.
Plan to submit at least 3 days before deadline.

Consider Assistance Needed

TTU RESOURCE: ORDC for proposal assistance in the development process. https://www.depts.ttu.edu/research/ordc/index.php

APPLICATION NOTES

All documents of the application should be prepared to support your project plan. Additional information follows in next sections.

***Document* Section**	**Required ?**	**Requirements**	**NSF Page Limit**
Cover Sheet: Project Title	YES	• Begin with "CAREER: " followed by informative title	**N/A**
Project Summary	YES	❖ Follow PAPPG (II.D.2.b.) • Include statement on Intellectual Merit and statement on Broader Impacts. The section titles, "Intellectual Merit" and "Broader Impacts", must be on separate lines from rest of text.	**1**
Project Description	YES	❖ Follow Solicitation (V.A.) and PAPPG (II.D.2.d.(i)-(vi)) (solicitation overrides PAPPG if overlap) • Must include section titled "Broader Impacts" (separate line from rest of text) • No URLs allowed.	**15**, including Results from Prior NSF Support
Results from Prior NSF Support	YES	❖ Follow PAPPG (II.D.2.d.(iii)) • Need only report on the one award that is most closely related to the proposal. • Support = salary support, as well as any other funding awarded by NSF, including research, Graduate Research Fellowship, Major Research Instrumentation, conference, equipment, travel, and center awards, etc. • Can be "Not Applicable" or "None"	**(5)**
References Cited	YES	❖ Follow Solicitation (V.A.) and PAPPG (II.D.2.e.)	**none**
Budget and *Budget Justification*	YES	❖ Follow Solicitation (V.B.) and PAPPG (II.D.2.f.(i)-(xiii)) • Justification must match Budget and include $ values. • The names of the PI(s), faculty, and other senior personnel and the estimated number of full-time-equivalent person-months for which NSF funding is requested, and the total amount of salaries requested per year, must be listed.	**5** Justification
Facilities, Equipment and Other Resources	YES	❖ Follow PAPPG (II.D.2.g.)	**none**
Senior Personnel Documents. *Each is a separate document.*		➢ *NSF Pre-award and Post-award Disclosures Relating to the Biographical Sketch and Current and Pending (Other) Support*: https://www.nsf.gov/bfa/dias/policy/disclosures_table/jan2023.pdf	
Biographical Sketch	YES	❖ Follow Solicitation (V.A.) and PAPPG (II.D.2.h.(i)) • Include research and education activities and accomplishments. • Acceptable formats: Fillable PDF form or SciENcv** ○ Fillable PDF approved format available at: https://beta.nsf.gov/funding/senior-personnel-documents	**3**
Current and Pending (Other) Support	YES	❖ Follow PAPPG (II.D.2.h.(ii)) • Acceptable formats: Fillable PDF form or SciENcv** ○ Fillable PDF approved format available at: https://beta.nsf.gov/funding/senior-personnel-documents (including link to FAQ) • IMPORTANT: Report *Projects/Proposals* (II.D.2.h.(ii) (g) (iii)) & *In-Kind Contributions* (II.D.2.h.(ii) (g) (iv))	**none**
Collaborators & Other Affiliations Information	YES	❖ Follow PAPPG (II.D.2.h.(iii)) • Acceptable format: Excel template available at https://beta.nsf.gov/funding/senior-personnel-documents (including link to FAQ)	**none**
Supplementary Documentation		IMPORTANT: Only the following documents are allowed. Each is a separate document.	
Postdoctoral Researcher Mentoring Plan	YES, IF…	• Required if requesting funding support to postdoctoral researchers ❖ Follow PAPPG (II.D.2.i.(i))	**1**

***Document* Section**	**Required ?**	**Requirements**	**NSF Page Limit**
Data Management Plan	YES	❖ Follow PAPPG (II.D.2.i.(ii)) • NSF Data Management Plan Requirements https://beta.nsf.gov/funding/data-management-plan **TTU RESOURCE:** Library https://guides.library.ttu.edu/c.php?g=543306&p=3722702 Matt McEniry, matthew.mceniry@ttu.edu	**2**
Rationale for Performance of All or Part of the Project Off-campus or Away from Organizational Headquarters	MAYBE	❖ Review PAPPG sections II.D.2.i.(iii)	
Other documents	MAYBE	❖ Review PAPPG sections II.D.2.i.(v)-(viii)	
Departmental Letter	YES	• Only one letter allowed ❖ Follow Solicitation section V.A. (Letter should not be construed as a Letter of Support for the PI and should address only the items listed in Solicitation) • Include the department head's name and title below the signature.	**2**
Letters of Collaboration	YES, IF…	❖ Follow Solicitation (V.A.) and PAPPG (II.D.2.i.(iv))	**1 / letter**
PECASE Eligibility	YES, IF…	❖ Follow Solicitation (V.A.)	**1**

**SciENcv guidance webpages: *Creating an NIH or NSF Biosketch with SciENcv* (by NIH National Library of Medicine) https://www.nlm.nih.gov/ncbi/workshops/2023-02_SciENcv/workshop-details.html

PROJECT DESCRIPTION

❖ Solicitation section V.A. gives a brief description of expected elements* in the Project Description. These should be followed.

In addition, consider the comprehensive list of elements below expected in a thorough proposal. Each element does not necessarily require a separate heading. Each element should show project intellectual merit, project broader impacts, and/or assurance that you are the right person to accomplish the project.

Use easy-to-follow organization with headings, sub-headings, lists, tables, pictures, etc. Use highlights (bold, italics) as appropriate to emphasize important points. Be concise. Use good grammar and punctuation.

TTU RESOURCE: Editor review is available through ORDC.

Proposal Elements:

- Description of proposed research*
- Background
- Rationale and significance (to NSF, your field, TTU)
- Preliminary data where appropriate* (literature review where appropriate)
- Hypothesis/overall objective/research question/etc.
- Specific objectives*
- Methods and procedures* (research design/ approach)
- Significance of results*
- Description of proposed educational activities*
- Intended impact of educational activities*
- Description of research and educational activities integration/synergism*
- Description of team and experience and expertise (augmented in Biosketch)
- Research/education relevance for your career trajectory/goals as a researcher and educator
- Description of broader impacts (besides educational activities)*
- Pitfalls and limitations, contingency plan(s)
- Expected outcomes
- Assessment and evaluation plan(s)/strategies*
- Definition of project success
- Distribution/delivery of results
- Timeline
- Future measures planned or possible
- Results of prior NSF support*

Although not part of the Project Description, all submission documents (e.g., Biographical Sketch, Facilities, Equipment and Other Resources, Data Management Plan) should support your efforts toward showing intellectual merit, broader impacts, and/or assurance that you are the right person and institution to accomplish the project.

Broader Impacts

Include some amount of funds for broader impact activities in budget.

❖ See Solicitation section VI.A.2. for examples of broader impacts.

See NSF Strategic Plan's Strategic Goals and Objectives, page 28, for strategic objectives that broader impacts might fall under.

Broader Impacts Resources

NSF Broader Impacts https://beta.nsf.gov/funding/learn/broader-impacts (examples, reasons, review)

NSF 101: Five tips for your Broader Impacts statement
https://beta.nsf.gov/science-matters/nsf-101-five-tips-your-broader-impacts-statement

NSF 21-059 Dear Colleague Letter: A Broader Impacts Framework for Proposals Submitted to NSF's Social, Behavioral, and Economic Sciences Directorate https://www.nsf.gov/pubs/2021/nsf21059/nsf21059.jsp?org=NSF

CISE Broader Impacts http://cisebroaderimpacts.org/

Advancing Research Impact in Society (ARIS) https://researchinsociety.org/ (see *Resources* for BI toolkit, advice, etc.)

TTU RESOURCE: STEM CORE https://www.depts.ttu.edu/stem/

TTU RESOURCE: STEM CORE past STEMinars https://www.depts.ttu.edu/stem/seminar/stem.php (search page for "broader impacts" to find related videos)

Education Plan

Include some amount of funds for educational activities in the budget. Allow 3-5 pages.

❖ See Solicitation section V.A. for examples of educational activities and focus groups.

Education Plan Resources

Common questions about the NSF CAREER education plan and activities https://vcresearch.berkeley.edu/sites/default/files/inline-files/Common%20questions_CAREER%20education%20plan_5_25_17_ver2.pdf -Research, University of California, Berkeley

Assessment and Evaluation

Include some amount of funds for assessment and evaluation in budget.
Try to use and reference validated assessment tools if available.

Assessment and Evaluation Resources

[NSF] *The 2002 User-Friendly Handbook for Project Evaluation* https://www.nsf.gov/pubs/2002/nsf02057/nsf02057.pdf

TTU EDUCATION EVALUATION RESOURCE: STEM CORE https://www.depts.ttu.edu/stem/

BUDGET

❖ Allowable costs include funds for (Solicitation V.B.):

- 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
- consultant expenses

❖ Additional allowable costs include funds for (PAPPG II.D.2.f.):

- fringe benefits
- equipment
- travel
- participant support costs
- materials and supplies
- publications/documentation/dissemination
- computer services
- subawards [note, Co-PIs not allowed on CAREER]
- indirect costs

Supplemental Funding Opportunities

Career Life Balance https://www.nsf.gov/career-life-balance/suppfunds.jsp
Research Opportunities in Europe for NSF CAREER Awardees
https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf23085&org=NSF
Research Opportunities in Germany for NSF CAREER Awardees https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf15059

Budget Resources

TTU RESOURCE: Office of Research Services - *Budget Development* https://www.depts.ttu.edu/research/ors/preaward/budget.php
TTU RESOURCE: Accounting Services - *Allowable Expenses & Types of Costs*
https://www.depts.ttu.edu/accountingservices/research-accounting/allowable-expenses-and-types-of-cost.php

MERIT REVIEW

❖ *NSF Proposal Processing and Review Procedures* (see Solicitation section VI.)
Review this section for insight into how NSF reviewers will evaluate proposals.

NSF Merit Review Process
https://www.nsf.gov/bfa/dias/policy/merit_review/

Merit Review Principles

❖ Review Solicitation section (VI.) for a description of the following three Principles expected in proposals:
1. Quality
2. Societal Goals
3. Assessment and Evaluation

Merit Review Criteria

1. Intellectual Merit
2. Broader Impacts

Both criteria are given full consideration.

Merit Review Criteria Elements

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?

Merit Review Resources

Note for Reviewers of CAREER Proposals (NSF 22-586) https://www.nsf.gov/crssprgm/career/note_for_reviewers.pdf
NSF *Merit Review Process*: https://nsfpolicyoutreach.com/resources/fall-2022-gc-merit-review-process/

HSI RESOURCES

PIs may want to include information about TTU as a Hispanic Serving Institution (HSI).

TTU RESOURCES: Programs and statistics at TTU (these lists are not exhaustive, and other resources may be found elsewhere):

HSI Programs & Initiatives, University Efforts
https://www.depts.ttu.edu/diversity/institutional-diversity/hispanic-serving/programs-initiatives.php

HSI Development, Resource & Professional Affiliations
https://www.depts.ttu.edu/diversity/institutional-diversity/hispanic-serving/affiliations.php

HSI Student Resources https://www.depts.ttu.edu/diversity/institutional-diversity/hispanic-serving/student-resources.php

TTU Institutional Research https://www.depts.ttu.edu/irim/

- College Profiles
- TTU Student Diversity Dashboard http://techdata.irs.ttu.edu/DiversityDashboard/Home.html

ADDITIONAL RESOURCES

NSF

Frequently Asked Questions (FAQs) for the Faculty Early Career Development (CAREER) Program for Submission in Years 2022 – 2026
https://nsf.gov/pubs/2022/nsf22100/nsf22100.jsp

Awards Advanced Search https://www.nsf.gov/awardsearch/advancedSearch.jsp (Program Information, Reference Code: 1045 (for CAREER). Additional Information: choose Active Awards and/or Expired Awards, or limit by date. Filter results by left column.)

NSF ENG CAREER Proposal Workshops
2023: https://beta.nsf.gov/events/2023-nsf-engineering-career-proposal-workshop
Older: https://apply.hub.ki/career/pastworkshops.html (yearly sites contain some documents from past workshops; mock review panel insights provided in some workshops, e.g., https://nsfengcareerworkshop.ccny.cuny.edu/nsf-eng-career-workshop-day-1/)

NSF CISE CAREER Workshops
2023: https://www.cnsr.ictas.vt.edu/NSF-CISE-CAREER-Workshop-23/index.html?utm_medium=email&utm_source=govdelivery
Older: https://www.nsf.gov/cise/workshops/career/

Beyond CAREER: *NSF 101: Funding opportunities for early career researchers*
https://beta.nsf.gov/science-matters/nsf-101-funding-opportunities-early-career

Texas Tech

TEXAS TECH UNIVERSITY
Office *of* Research Development & Communications

Graphics Assistance
Amber McCord, Assistant Professor of Practice, Professional Communication, CoMC amber.mccord@ttu.edu

Editors
Arranged by ORDC

NSF CAREER Workshops https://www.depts.ttu.edu/research/ordc/videos.php

TTU Office of Research Development and Communications (ORDC) https://www.depts.ttu.edu/research/ordc/index.php

- Finding Funding & Research Career Mapping
- Proposal Development
- SCAN Sessions
- Grant Editors
- Proposal Library
- Graphics Assistance
- Program Officer Assistance
- Workshops & Training Events
- CAREER questions and assistance

Small Groups to discuss specific aspects of proposal writing, CAREER elements, etc.
Arranged by ORDC

Broader Impacts, Assessment

STEM CORE https://www.depts.ttu.edu/stem/ & https://www.depts.ttu.edu/stem/research/index.php

NOTES