2024 CAREER Program NSF 22-586—NSF Grants Conf.

Carole J. Read,
Chair, NSF CAREER Coordinating Committee
June 6, 2024

Faculty Early Career Development (CAREER) Program (NSF 22-586): Goals

- "A Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as **academic role models in research and education and to lead advances in the mission of their department or organization.**"
- "Activities pursued by early-career faculty should build a firm foundation for a **lifetime of leadership in integrating education and research**."

Faculty Early Career Development (CAREER) Program (NSF 22-586)--Revisions

- Deadline change to the 4th Wednesday in July (July 24, 2024 is the next submission date)
- Addition of a clarification sentence in the departmental chair letter to state that the Chair Letter is not a support letter.
- Edits in the PECASE language that adds the additional requirement for the PI candidate to reflect commitment to STEM equity, diversity, accessibility, and/or inclusion. The language also updates the new allocation of PECASE candidates for NSF.
- Inclusion of new single copy document for PIs to include that states their eligibility for PECASE. It is not a required document. There is an opportunity for the PI to submit this "certification" post award via an interim report to the cognizant program officer if they did not have the required status as of their submission date.
- CAREER submission will be through Research.gov or Grants.gov.

PAPPG 24-1—Covers July 2024 submission

- PAPPG 24-1 Covers the requirements for CAREER proposal submitted to July 2024 deadline
- Be sure to include all requirements of the new PAPPG—For example
  - Chapter II.D.2.i(i), **Mentoring Plan**, has been expanded to address the revision to Section 7008(a) of the America COMPETES Act of 2022 (42 U.S.C. § 1862o(a)) **requiring a mentoring plan for postdoctoral researchers or graduate students supported on the project**. *This page limitation for the Mentoring Plan remains one page.*
  - Chapter I.F, **When to Submit Proposals**, has been modified to clarify that the **5 p.m. submitter's local time is tied to the organization**, and not the location of the PI.
  - Chapter II.D.2.h(i), **Biographical Sketch(es)**, the updated guidance serves as NSF's implementation of the biographical sketch common form developed by the National Science and Technology Council's Research Security Subcommittee.

Faculty Early Career Development (CAREER) Program (NSF 22-586)

- Read the solicitation NSF 22-586 and NSF 22-100 FAQs
- Project duration: 5 years
- Your proposal must be compliant with all the requirements of the current NSF Proposal and Award Policies & Procedures Guide PAPPG 24-1
- Eligibility is your status as of the submission date
- Due date this year: July 24, 2024, (Wed) 5:00pm local time

Faculty Early Career Development (CAREER) Program (NSF 22-586)--Submission

- Submission is through Research.gov or Grants.gov
- Check out the submission logistics webinar on Friday, June 7, 2024, from 2:00 to 3:30 PM Eastern time
- Submit logistics questions to careerproposalprep@nsf.gov
- Webinar registration link will be available in an advisory at the top of the Research.gov homepage on Monday, May 13. After registering, you will receive a confirmation email with details about joining the webinar.

CAREER or Regular proposal?

- CAREER proposals are ***single-PI*** projects that include research and education activities that are integrated, innovative, and ambitious
- CAREER proposals require a Departmental Chair letter
- The CAREER program's aims are lofty – CAREER awards are a lot of work
- Are you at the right stage in your career to undertake the commitments of a CAREER award?
- Have you discussed your ideas with mentors / peers / program directors?
- Have you demonstrated commitment to both research and education?

Investigator Eligibility Criteria

- Hold a doctoral degree by proposal deadline
- Be untenured and employed in an at least 50% tenure-track (or tenure-track-equivalent) assistant professor (or equivalent title) position at an eligible institution as of the annual deadline
- Have both research and educational responsibilities at the eligible institution
- Have not previously received a CAREER award
- Have not had more than two CAREER proposals reviewed previously
- Eligibility certified in Departmental Letter

Investigator Eligibility Criteria-Non Tenure

- Any non-tenure track faculty is potentially eligible
- Adjunct faculty not eligible
- Continuing appointment that is expected to last the five years of the CAREER award
- Appointment has substantial research and educational goals
- Early career equivalent to pre-tenure
- All other eligibility requirements also apply
- Eligibility certified in Departmental Letter
- The solicitation says “expected to last” not “guaranteed to last” so no institution is promising a guarantee of full employment with this letter.

Departmental Letter (2 pages max)

- Statement indicating the PI's eligibility for the CAREER program based on PI's status as of submission date
- Description of how the PI's career goals and responsibilities mesh with that of the organization and department
- Commitment to the PI's proposed CAREER research and education activities
- Description of how the department will contribute to the professional development of the PI with mentoring and whatever is needed to further the PI's efforts to integrate research and education

Note: The Departmental letter is not a letter of support but should address these items above.

CAREER Personnel and Budgets

- Co-PIs on cover sheet are not allowed
- Request for support of other senior personnel, consultants, or sub-awards is allowed, commensurate with a limited role in the project
- International activities are encouraged and may be supported by the Office of International Science and Engineering (OISE)
- Programs may support buy-out of academic year time for teaching-intensive institutions (check with your Program Director)
- Programs may or may not prefer to make awards with budget close to the anticipated minimum size (check with your Program Director)

Unfunded Collaborators

- Follow requirements of PAPPG 24-1, ex. section Chapter II.C.2.d(iv)
- Any substantial collaboration with individuals not included in the budget should be described in the Facilities, Equipment and Other Resources section of the proposal (see Chapter II.C.2.i) and documented in a letter of collaboration from each collaborator.
- Such letters should be provided in the supplementary documentation section in Research.gov and follow the format specified in Chapter II.C.2.j. Collaborative activities that are identified in the budget should follow the instructions in Chapter II.D.3.
- Unfunded collaborators like senior personnel should have a limited role in the project's intellectual merit and broader impacts for a CAREER project.

CAREER varies across NSF

- CAREER proposals are submitted to, and reviewed by, one or more of the disciplinary research programs
- Typical award sizes vary according to Directorate/Division/Program
- Expectations for scope of research and education activities vary with disciplinary community norms
- Contact relevant Program Directors to discuss your ideas and seek more information. If need help to identify a suitable program, contact Division Contact(s) -http://www.nsf.gov/crssprgm/career/contacts.jsp
- For interdisciplinary proposals, contact all relevant Program Directors or Division Contacts

Merit Review of CAREER varies across NSF

- Ad hoc & Panel (review with other proposals under consideration by the disciplinary program):
  - most of GEO (AGS uses ad hoc only)
  - BIO and SBE
- Primarily dedicated CAREER Panels :
  - ENG, CISE, EDU
- MPS varies by Division:
  - AST : Panel only
  - CHE, DMR – Mix of ad hoc & panels
  - DMS – Mostly panel
  - PHY – Mostly ad hoc

CAREER Proposal Criteria

- Evaluated using NSF's two merit review criteria:
  - What is the intellectual merit of the proposed activity?
  - What are the broader impacts of the proposed activity?

- Additional Consideration for CAREER proposals
  - Integration of Research and Education

CAREER Proposal Review Considerations

- The **Intellectual Merit** is the potential that your research has to advance the knowledge base of the field of science or engineering.
- The **Broader Impact**s focus on the potential benefit to society and achievement of desired societal outcomes.
- The **Integration of Research and Education** describes the reciprocal relationship between the proposed research and education activities and how they may inform each other in their career development as both outstanding researchers and educators.

NSF Merit Review Criteria

The following elements should be considered for INTELLECTUAL MERIT and BROADER IMPACTS

1. What is the potential for the proposed activity to:
   - **a)** **INTELLECTUAL MERIT**: Potential to advance knowledge; and
   - **b)** **BROADER IMPACTS**: Potential to benefit society and contribute to the achievement of specific, desired societal outcomes
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?

Broader Impacts

- The Broader Impacts focuses on the potential benefits of the research itself and the educational outcomes to society and achievement of desired societal outcomes
- Make a clear argument for the Broader Impacts of the research itself
- Means to benefit society include:
  - Economic/environment/energy
  - Education and training
  - Providing opportunities for underrepresented groups
  - Improving research and education infrastructure

The key issue is how your research results will be applied — why would the general public care?

Integration of Research and Education

- All CAREER proposals must have an integrated research and education plan at their core.
- NSF recognizes that there is no single approach to an integrated research and education plan; but encourages all applicants to think creatively about how their research will impact their education goals and, conversely, how their education activities will feed back into their research.
- These plans should reflect the proposer's own disciplinary and educational interests and goals, as well as the needs and context of his or her organization.
- Because there may be different expectations within different disciplinary fields and/or different organizations, a wide range of research and education activities may be appropriate for the CAREER program

Integration of Research and Education

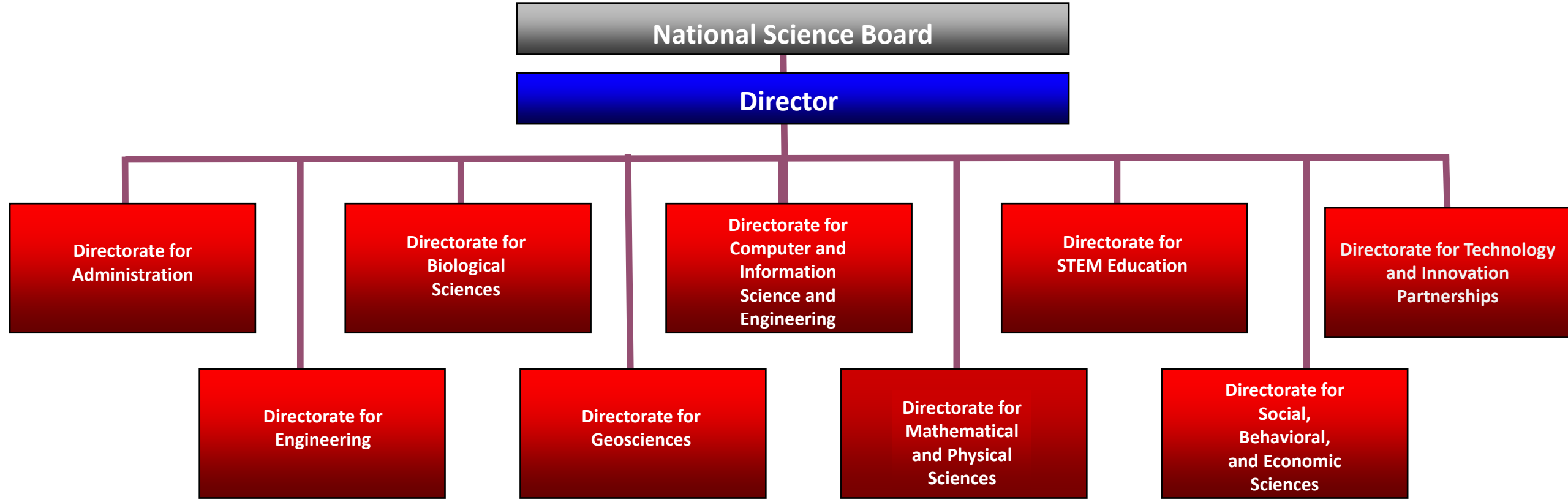
- Think creatively about the reciprocal relationship between research and education activities and how they may inform each other in your career development
- Plans should reflect your own disciplinary and educational interests and goals, as well as the needs and context of your organization
- There are different expectations within different disciplinary fields – a wide range of research and education activities may be appropriate for the CAREER program
- Some investigators may wish to pursue an additional activity such as entrepreneurship, industry partnerships, or policy that enhances their research and education plans
- See the CAREER program solicitation for thought-provoking examples
- Communicate with the CAREER contact(s) in the Division(s) closest to your area of research to discuss expectations

Finding a research home

- Your research objectives and the knowledge gained immediately from the proposed work determines the NSF program fit, not the application of your research results.
- Be prepared to answer the question: “What is your research objective?” to help form your topic area
- Check out the CAREER program contacts page:

https://www.nsf.gov/crssprgm/career/contacts.jsp

NSF is Organized Around Research Topics



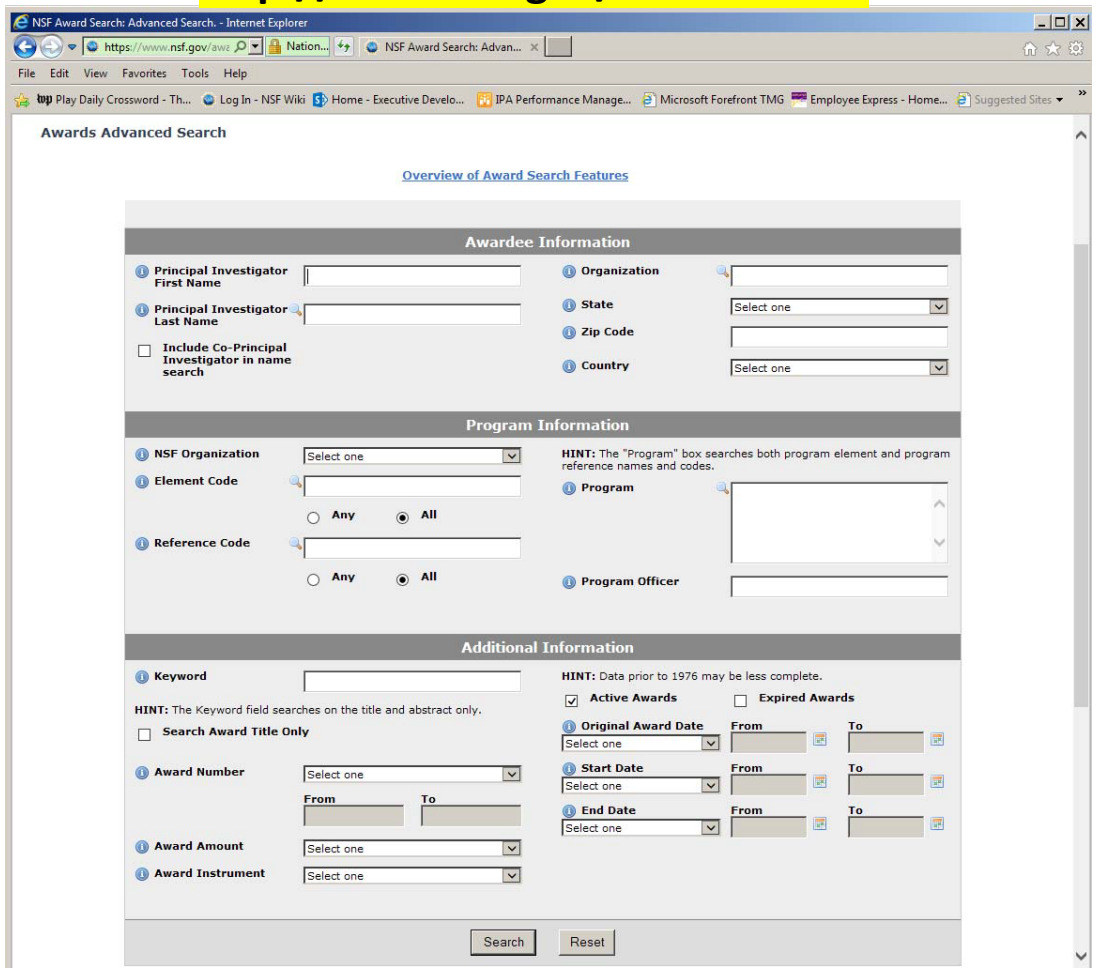
The Next Step: You submit to a program

- Look at NSF's web site: www.nsf.gov and www.nsf.gov/funding
  - Check out research programs
  - Read what research topics they support
  - Abstracts for recent awards
  - Workshop reports

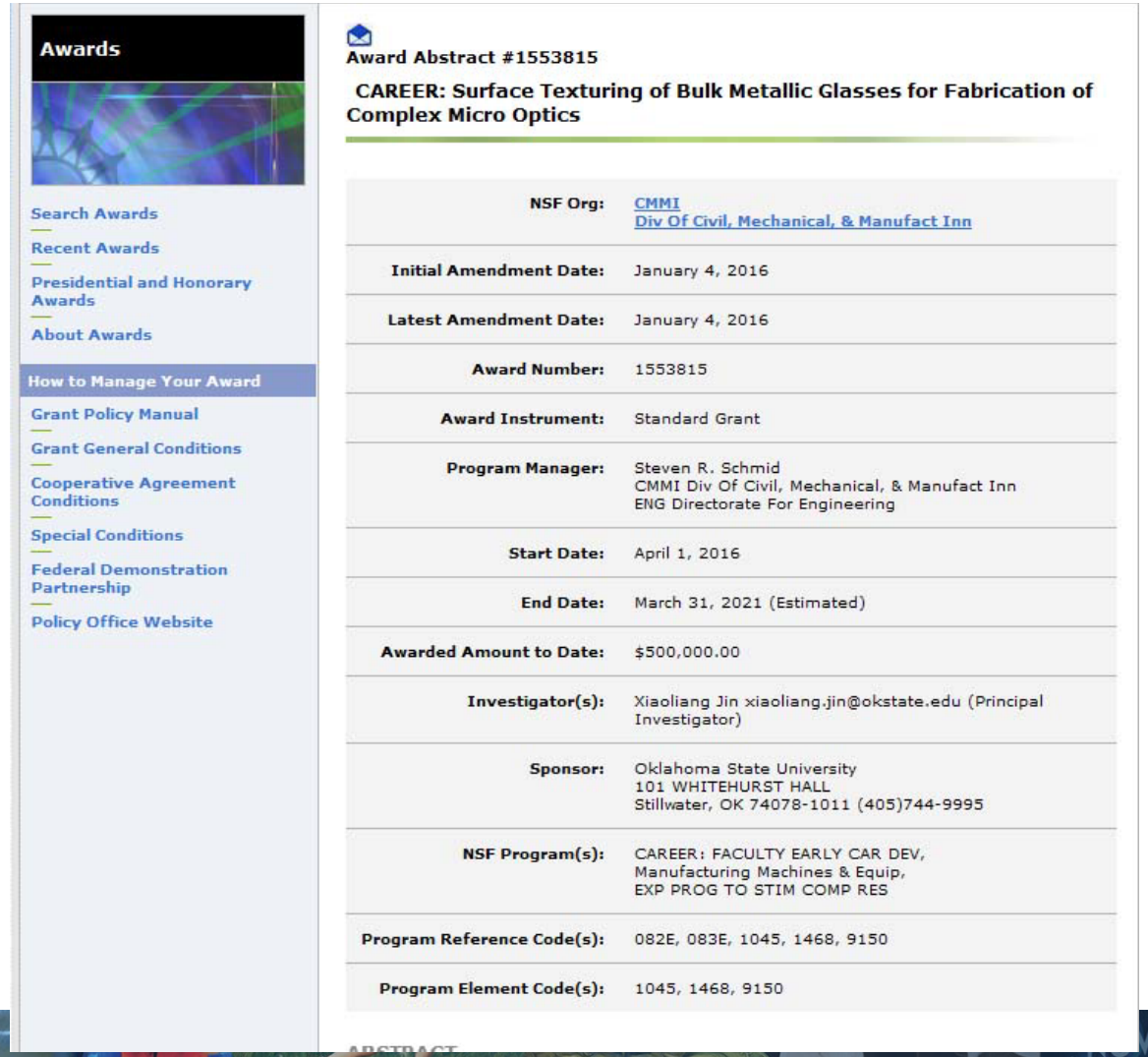
- Not sure who to contact with idea? Check out the division and directorate CAREER Contacts: https://www.nsf.gov/crssprgm/career/contacts.jsp

Award Search Capabilities

http://www.nsf.gov/awardsearch



Award Data



Awards

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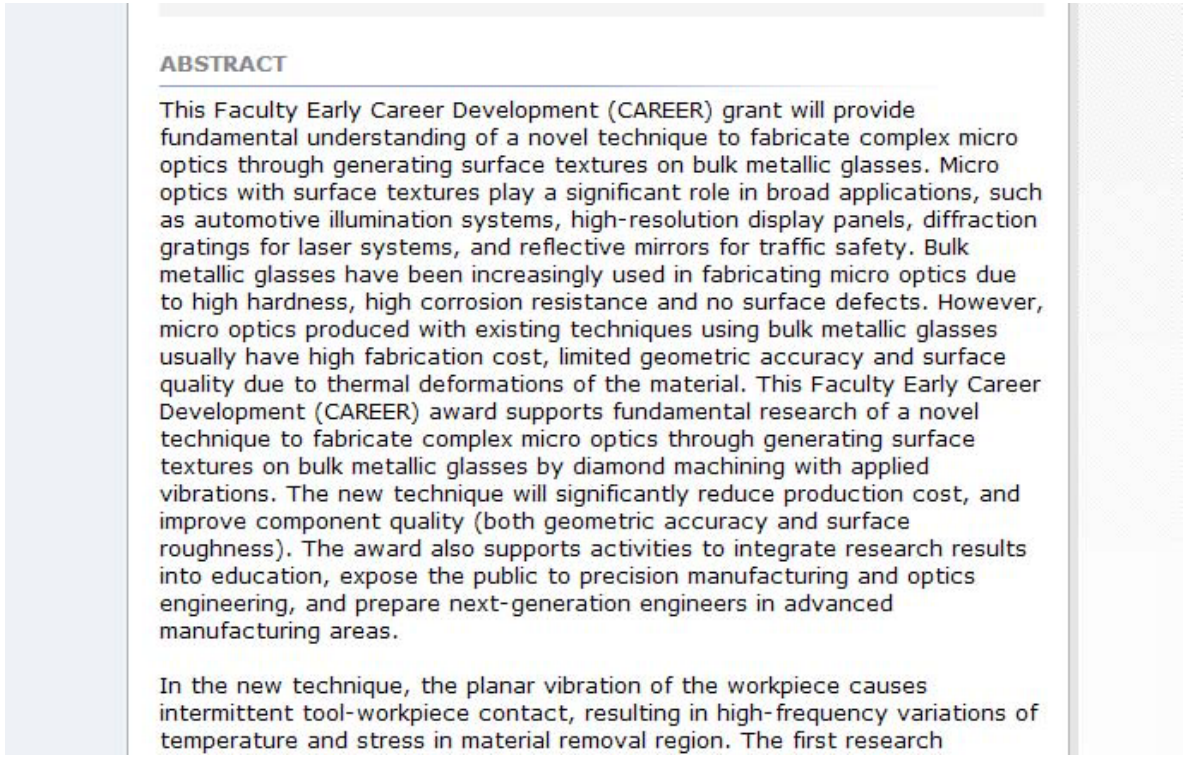
Award Abstract #1553815

CAREER: Surface Texturing of Bulk Metallic Glasses for Fabrication of Complex Micro Optics

NSF Org:	CMMI Div Of Civil, Mechanical, & Manufact Inn
Initial Amendment Date:	January 4, 2016
Latest Amendment Date:	January 4, 2016
Award Number:	1553815
Award Instrument:	Standard Grant
Program Manager:	Steven R. Schmid CMMI Div Of Civil, Mechanical, & Manufact Inn ENG Directorate For Engineering
Start Date:	April 1, 2016
End Date:	March 31, 2021 (Estimated)
Awarded Amount to Date:	$500,000.00
Investigator(s):	Xiaoliang Jin xiaoliang.jin@okstate.edu (Principal Investigator)
Sponsor:	Oklahoma State University 101 WHITEHURST HALL Stillwater, OK 74078-1011 (405)744-9995
NSF Program(s):	CAREER: FACULTY EARLY CAR DEV, Manufacturing Machines & Equip, EXP PROG TO STIM COMP RES
Program Reference Code(s):	082E, 083E, 1045, 1468, 9150
Program Element Code(s):	1045, 1468, 9150

ABSTRACT

Award Abstracts



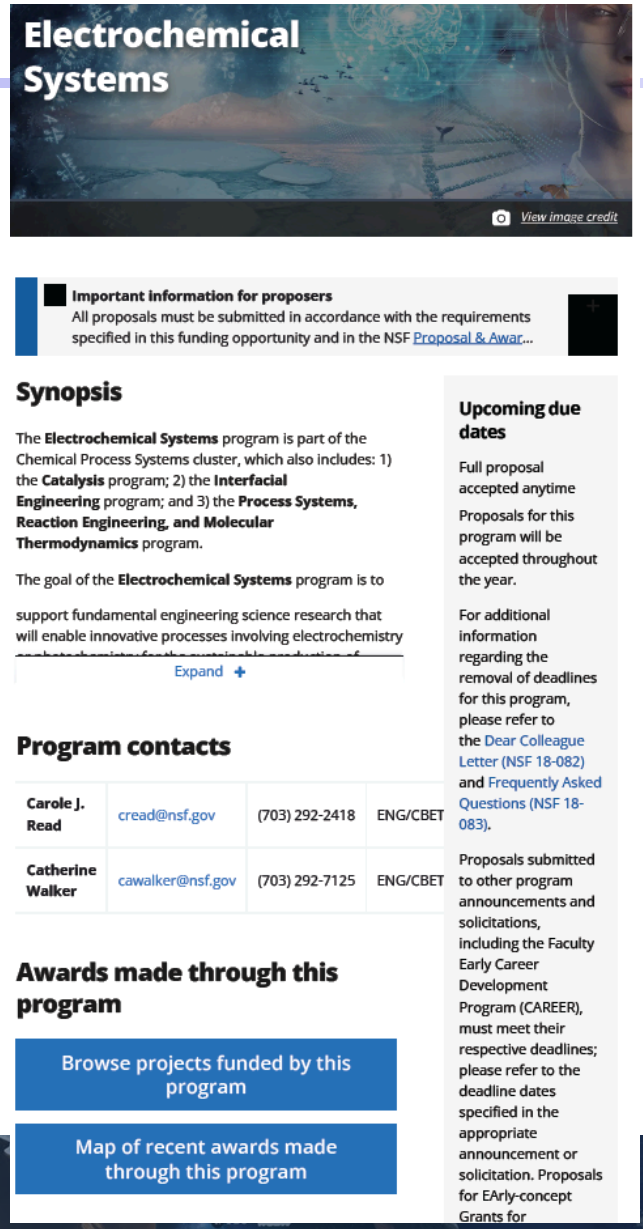
ABSTRACT

This Faculty Early Career Development (CAREER) grant will provide fundamental understanding of a novel technique to fabricate complex micro optics through generating surface textures on bulk metallic glasses. Micro optics with surface textures play a significant role in broad applications, such as automotive illumination systems, high-resolution display panels, diffraction gratings for laser systems, and reflective mirrors for traffic safety. Bulk metallic glasses have been increasingly used in fabricating micro optics due to high hardness, high corrosion resistance and no surface defects. However, micro optics produced with existing techniques using bulk metallic glasses usually have high fabrication cost, limited geometric accuracy and surface quality due to thermal deformations of the material. This Faculty Early Career Development (CAREER) award supports fundamental research of a novel technique to fabricate complex micro optics through generating surface textures on bulk metallic glasses by diamond machining with applied vibrations. The new technique will significantly reduce production cost, and improve component quality (both geometric accuracy and surface roughness). The award also supports activities to integrate research results into education, expose the public to precision manufacturing and optics engineering, and prepare next-generation engineers in advanced manufacturing areas.

In the new technique, the planar vibration of the workpiece causes intermittent tool-workpiece contact, resulting in high-frequency variations of temperature and stress in material removal region. The first research

Program Descriptions

- Program descriptions describe the topics and types of research questions addressed by a particular core/discipline program
- You can see the program contacts—Best to email
- Also you can see recent awards and a map of awards made

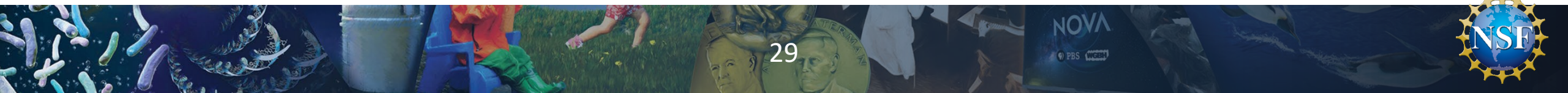


What if my project spans more than 1 program?

- Relook at project scope. Can it be tuned/scaled back so key innovation lies within one program description?
- Sequentially, send to program officer(s) for program fit feedback
- Listen and reflect on program officer feedback-That is what reviewers are looking for in that program
- Revise proposal to align to the final single program for optimal program alignment
- You can indicate a secondary program; but can only submit to one program for CAREER.

CAREER Proposal Ingredients

- An integrated plan for research and education, ambitious but feasible in the 5-year project
- Compelling argument that project will achieve effective integration of or synergy between research and education activities
- Departmental Letter confirming eligibility and demonstrating commitment to the career development of the investigator
- Letters of Collaboration (not of support or endorsement) when appropriate
- A budget that is consistent with the scope of the research and education activities



Take home: Proposal Basics

- Your proposal will be evaluated by the reviewers
- Reviewers need to know just a few things:
  - What is it about (the research objective)?
  - How will you do it (the technical approach)?
  - Can you do it (you and your facilities)?
  - Is it worth doing (intellectual merit and broader impacts)?
  - Will the effort provide a firm foundation for your career plans (integration of education and research)?
- This is, basically, all the proposal needs to convey – but it needs to convey this

We encourage you to contact Program Directors

- Email the appropriate program director(s) and ask if your research project fits their program
  - One-page summary (preferred)
- Your program director can:
  - Confirm program fit
  - Give advice on common proposal preparation errors
  - Help you understand the review of a previous proposal
  - Point you to resources you can use to help write a better proposal next time
  - Give general guidance on good proposal writing

Volunteer to Be a Reviewer

- Proposal review is an important service to your community
- There's no better way to see how the system works
- There's no better way to understand what makes a proposal compelling

- Email the program officer of the program your expertise aligns with and include a 2-page NSF biosketch and keywords on your expertise for interest in reviewing

Questions?

Carole Read, cread@nsf.gov

Submission logistics webinar, June 7, 2024, from 2:00 to 3:30 PM Eastern time
Submit logistics questions to careerproposalprep@nsf.gov
Webinar registration link on Research.gov homepage on Monday, May 13