Writing Your CAREER Proposal

2018 NSF/CMMI CAREER Proposal Writing Workshop

Charlotte, NC

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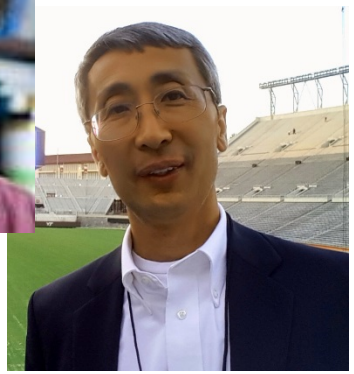

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Schedule

- Overview
- Your Strategic Plan
- Identifying a Research Topic
- Research Objective
- Finding a Home
- Writing the Project Summary
- Putting the Proposal Together
- Review Criteria
- Merit Review Process
- Summary

CAREER Program

- "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."

CAREER Program

- Solicitation: NSF 17-537
- Due date: ENG July 19, 2018
- Duration: 5 years
- Min amount: $500,000 in ENG
- Award amount in CMMI: $500,000

Eligibility

- Eligible PIs must:
  - Hold a PhD degree in a field supported by NSF
  - Be engaged in an area of research supported by NSF
  - Be employed in a tenure-track or equivalent position by October 1, 2018
  - Have not previously received a CAREER award
- Maximum of three tries
  - withdrawals and returns without review do not count
- Maximum of one CAREER proposal per year

CAREER Proposal Preparation

- Identify your submission by the solicitation number: NSF 17-537
  - Choose the correct disciplinary program for submission
  - Begin the title with "CAREER:"
- No Co-PIs allowed
  - Support for other senior personnel or consultants is permitted, but must be commensurate with their limited role in the project
- Project Description must not exceed 15 pages
- Your proposal must be compliant with all requirements of the current NSF Proposal and Award Policies & Procedures Guide (PAPPG 18-1)

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 Impacts** 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.

Success

- "Successful applicants will propose creative, effective research and education plans, along with strategies for assessing these components."
- Quality of the proposal is the key determinant of award or declination, not the
  - Funding rate
  - PI's home institution
  - PI's PhD institution or advisor
  - PI's geographic location
  - PI's gender, heritage, native language, height, etc.
  - Number of times a PI meets with the PD

It's All About You

You

- Who are you?
  - Your expertise/interests
  - Your career/life goals
  - Your position/resources
- Your proposal should fit into your life plan

What is your life plan?

Do you need to develop a strategic plan?

Your Strategic Plan

- A strategic plan has three parts:
  - Where are you today?
  - Where do you want to be in the future (5, 10, 20 years from now)?
  - How do you get from here to there?
- Questions: What do you want to leave as your career legacy? Do you need to work on important problems?

A strategic plan is a roadmap for your life

Your Proposal

- Should advance you toward your life goals
  - Should be a stepping stone to the next thing
- Should be compatible with your institution's goals
- Should represent a contribution to society at large

Test: If you accomplish your objectives, are you better off for the effort?

DO

- Have a strategic plan
- Build on your strengths
- Differentiate this proposal from your Ph.D. thesis work and other sponsored work
- Perform a thorough literature search (and in some cases exploratory research) before writing the proposal
  - Journal articles (update with personal contacts)
- Read the NSF PAPPG
- Establish and keep your contacts

DO NOT

- Rush
- Wait until last minute (1 month) to contact a program director
- Make the proposed work (research and education) too broad
- Make the proposed work too narrow
- Ask for too much (or too little) money
- Ignore rules (PAPPG)
- Try to submit your proposal late

Proposal Basics

- Write to the reviewers (not to PD and not to yourself)
- Your proposal will be judged 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?
- This is, basically, all the proposal needs to convey – but it needs to convey this

Identifying Your Research Topic

Be aware …

The CAREER award is not a research award.

The CAREER award is a career development award.

Your proposal must reflect this focus.

NSF Funds Fundamental Research

- NSF look for proposals that
  - Are innovative and push the frontiers of knowledge
  - Contribute to national needs and priorities
  - Go beyond marginalia
  - Integrate research and educational goals well
  - Actually involve research, not development
- NSF does not support (except as incidental to the goals of the award)
  - Developmental efforts
  - Computer programming
  - Design of an artifact
  - Commercialization of a product
  - Process optimization

The CAREER Research Topic

- The CAREER proposal is *not* a research proposal
- The CAREER proposal is a proposal detailing how you will spend $500,000 to enhance your career development
- Your career involves a research *path*, not a research project
- Determine your research path - your lifelong research goals - and then identify milestones toward your goals
- Detail the first one or two as the research projects for your CAREER proposal

Your CAREER Research Path

- Lifelong research goals
  - Don’t end with a single project
  - May never be fully achieved
  - Have broad application
- Examples:
  - To improve our ability to make engineering decisions under uncertainty and risk
  - To perform large-scale modeling of engineering systems thereby enabling better system optimization
  - To improve our understanding of material removal mechanisms enabling improvements in machining operations

The Selected Research Topic

- It must be research
- It must not have been done before
- It must be significant
- It must be feasible
- It must lend itself to a viable research plan – there must be a research methodology
- You must have access to the facilities to accomplish the research
- It should fit into your strategic plan

What is Research?

- Research is the *process* of finding out something that we (everyone) don't already know
- Scientific research builds upon the extant knowledge base and it is methodical, repeatable and verifiable
  - Methodical - you can specify in advance of the research a method to accomplish your objective
  - Repeatable - not a "strange" (random) event
  - Verifiable - tangible evidence

Question: Exactly what will your research contribute to the knowledge base?

What is Research?

If your proposal focuses on an artifact, it's probably development.

If it focuses on knowledge, it's likely to be research.

Ref: Research 101 for Engineers

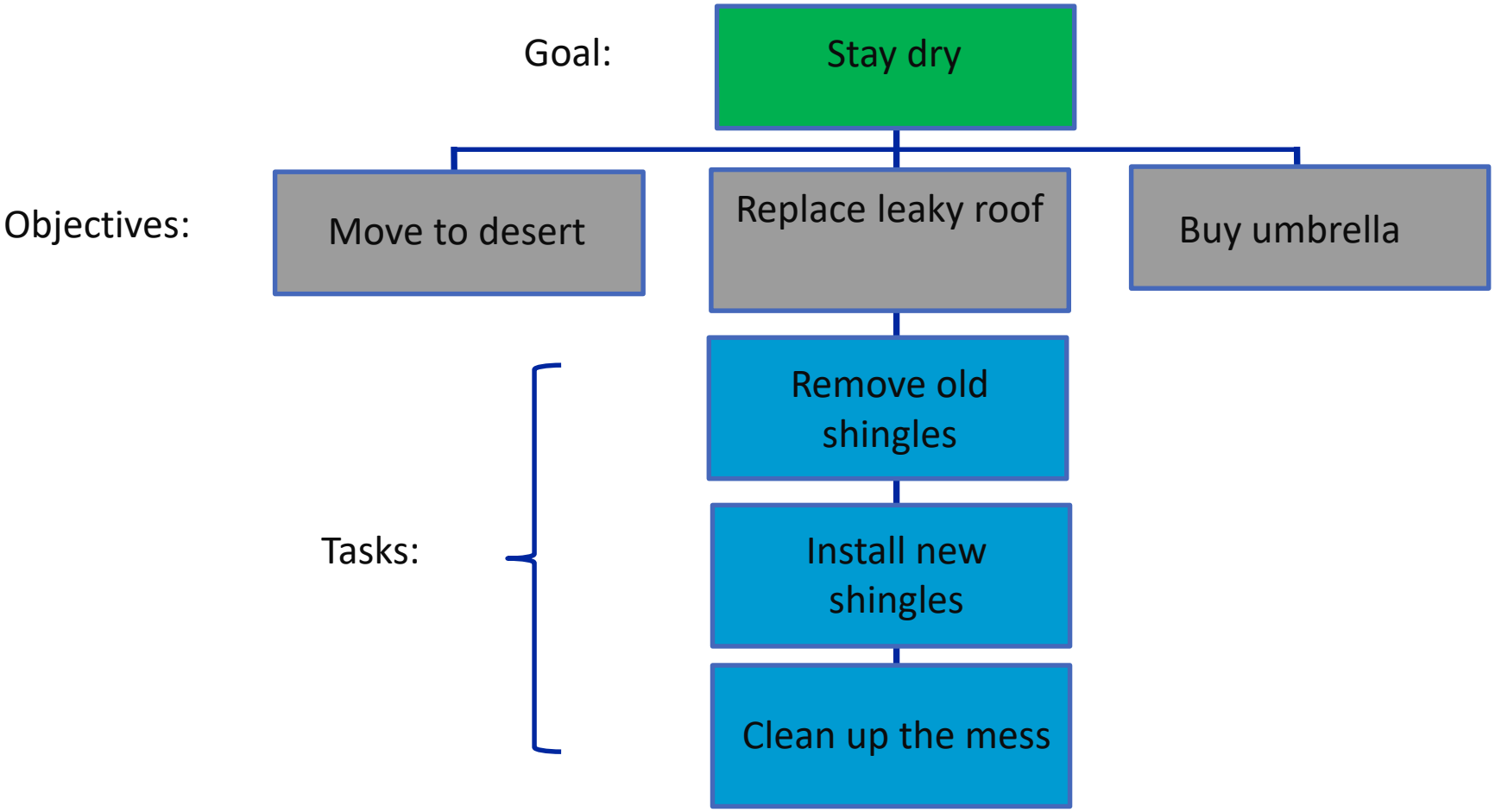
Groundwork

- Know your field:
  - What is the current state-of-the-art?
  - Who are the top ten researchers?
  - What are they doing right now?
  - Where do they get their funding?
  - What do they consider to be the key research issues?
  - Who would likely review your proposal?
  - What are your potential sources of funding?

Objective vs. Goal

- Goal: To stay dry
- Objective: Replace the leaky roof over your head
- The goal is what you want to achieve, the objective is how you intend to achieve it
- Goals motivate objectives
- Objectives frame tasks
  - Task 1—remove the old shingles
  - Task 2—install new shingles
  - Task 3—clean up the mess
- We pursue goals, we achieve objectives by accomplishing tasks
- There may be many ways to pursue a goal, but few ways to achieve an objective

Goals, Objectives, Tasks



The Research Objective

- Acceptable ways to do it right:
  - The research objective of this proposal is to test the hypothesis *H*.
  - The research objective of this proposal is to measure parameter *P* with accuracy *A.*
  - The research objective of this proposal is to prove conjecture *C.*
  - The research objective of this proposal is to apply method *M* from field *Q* to solve problem *X* in field *R.*

The Research Objective Leads One ….

A well-stated objective leads one directly to the approach that must be taken to accomplish the objective.

The Research Objective
Poorly Stated Examples

- This is probably the hardest part of the proposal!
- Poorly stated objectives:
  - The research objective of this project is to create novel new transformational knowledge in mechanics.
  - The objective of my research is to provide a quantum leap in the design of fracture-resistant composites.
  - The objective of this project is to develop an integrated modeling tool for the hardening process in light-weight alloys.
  - The goal of this project is to develop innovative advances to enhance multifunctional behavior in two-dimensional materials.
  - The aim of this project is develop a universal theoretical framework to describe the fracture behavior of ductile and brittle materials
  - The objective of this proposal is to design fast optimization algorithms for model predictive control of power electronic converters implemented in field-programmable gate arrays.

The Research Objective Better Examples

- How to do it right:
  - The research objective of this proposal is to test the hypothesis that deformation process x dominates the creep behavior at high temperatures in such-and-such types of alloys.
  - The research objective of this proposal is to test the hypothesis that physical phenomena x,y,z dominate the chip formation process in the machining of brittle materials.
  - The research objective of this project is to quantify the effect of uncertainty in fiber distribution and size on the delamination strength in carbon nanofiber reinforced composites.

A Side Note on Hypothesis Testing

- If you are going to do an hypothesis test, you need to learn to do it right
  - You must state a scientific hypothesis
  - You must state a testable hypothesis—one for which you can write a plan
  - Recognize that you can falsify the hypothesis or fail to prove it—generally a well stated hypothesis cannot be proven true
  - The test of the hypothesis needs to be well planned
  - Ref: Karl Popper

In Summary

- Frame your research: “My long-term research goal is…”
- Then: “As a step toward this goal, the research objective(s) of this CAREER proposal is(are)...”
- Limit: 25 words or less
- Be specific about your research objective
- Note - if you are specific, the research methodology will follow directly
- Be sure your statement is comprehensible
- Put it up front in your Project Summary
- Do not give a weather report or state-of-the-union address

Beyond the Research Objective

- Your proposal must address critical questions that reviewers will ask:
  - What is the proposal about?
    - » Be sure to include clear statements of both research and educational objectives
  - Will the proposed approach accomplish the stated objectives?
    - » Be sure the reviewers are evaluating your approach based on your objectives
  - Can the PI carry out the proposed approach?
    - » Preliminary results, previous work, experience, access to facilities etc. address this
  - Is it worth doing?
    - » Make the argument through the intellectual merit and broader impacts statements
  - Will the effort provide a firm foundation for your teacher-scholar career path?

Finding a Home

Questions

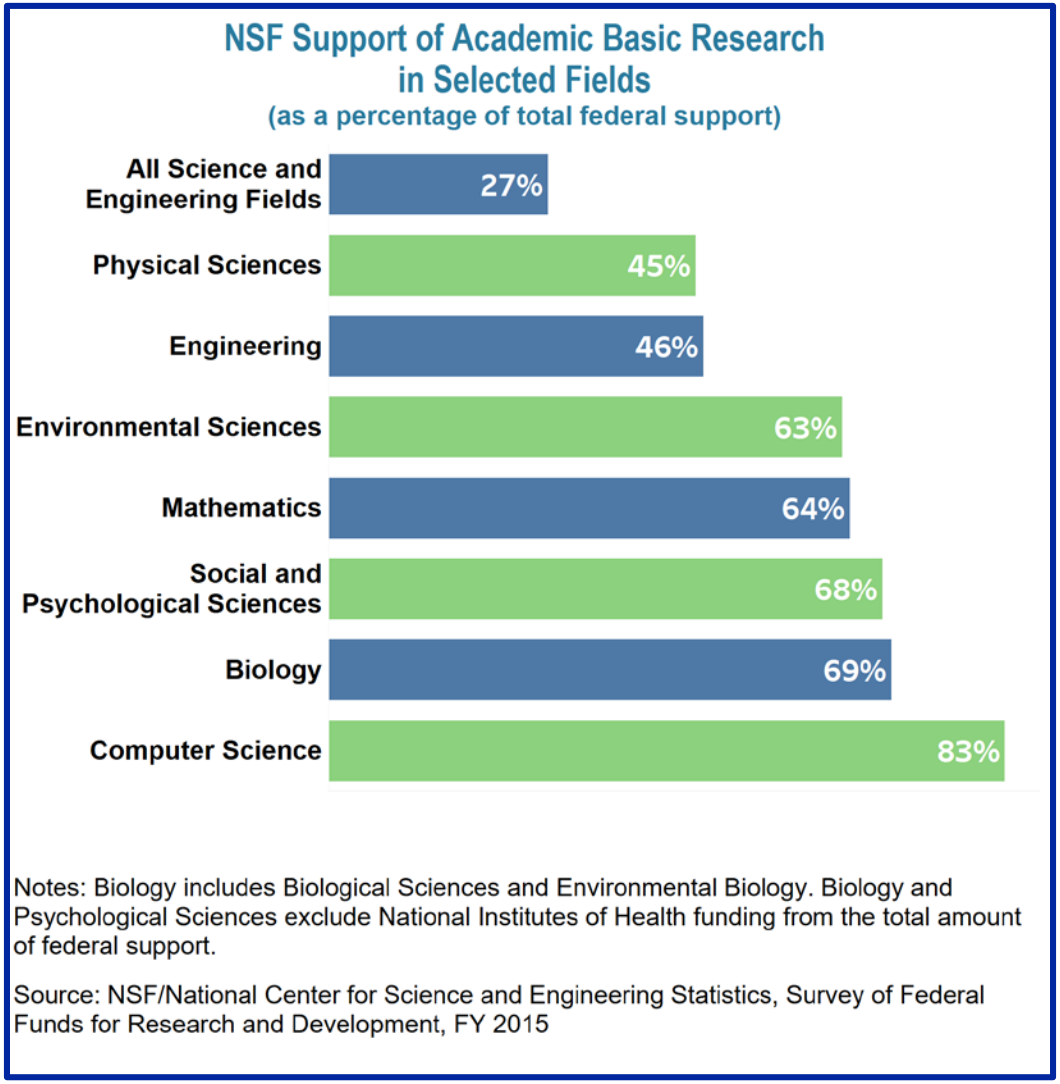
- Are you proposing scientific research?
- No?
  - Look for support from other sources
- Yes?
  - Your research objective determines the NSF program fit, not the application of your research results.
- Be prepared to answer the question: “What is your research objective?” in 25 words or less

Your Funding Base

- NSF will likely not be the sole source of funding for your area of research
  - University, center support
  - State support
  - Industry support
  - Other Federal agency support

List the potential funding sources for your research area.

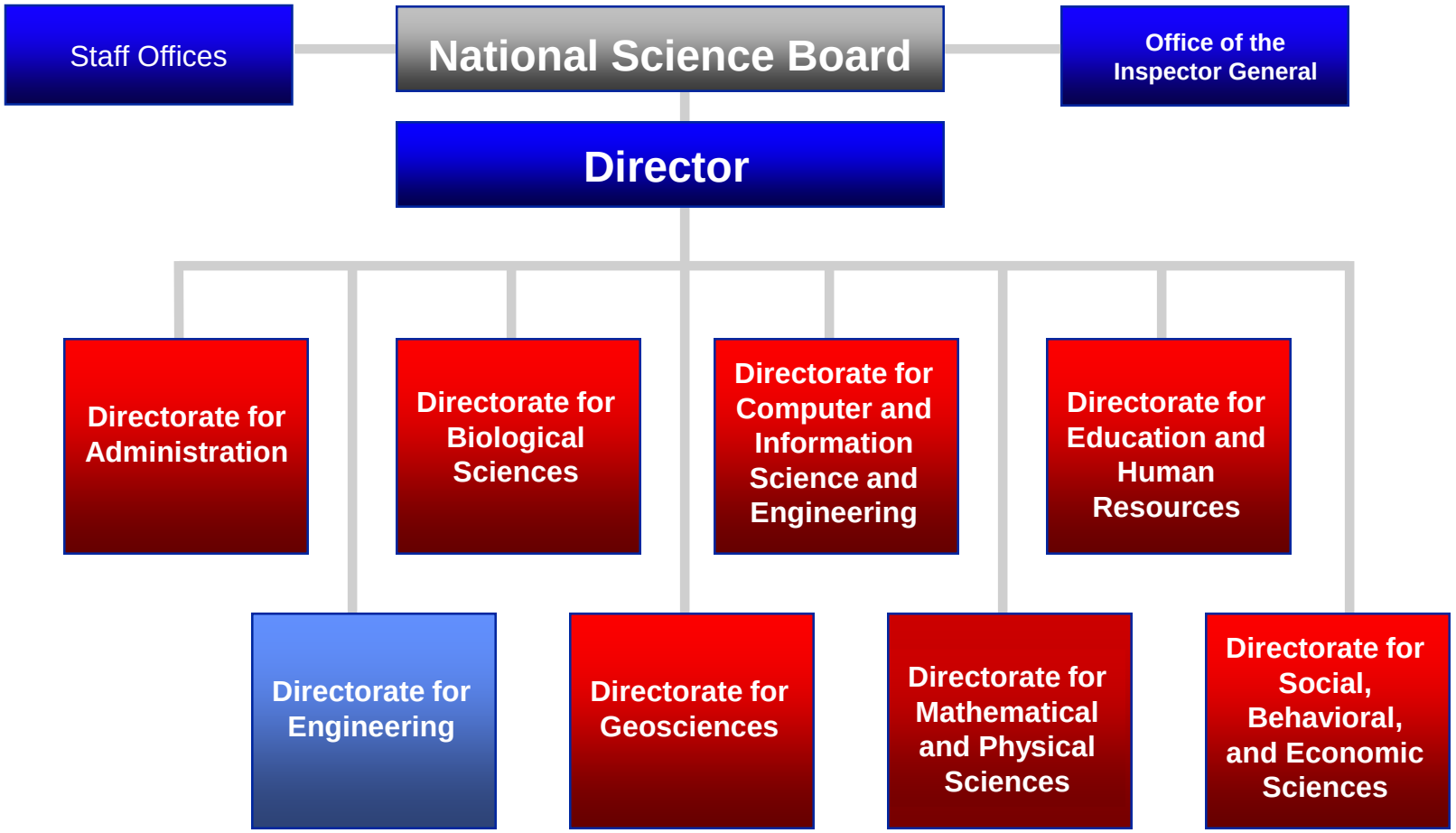
Federal Funding



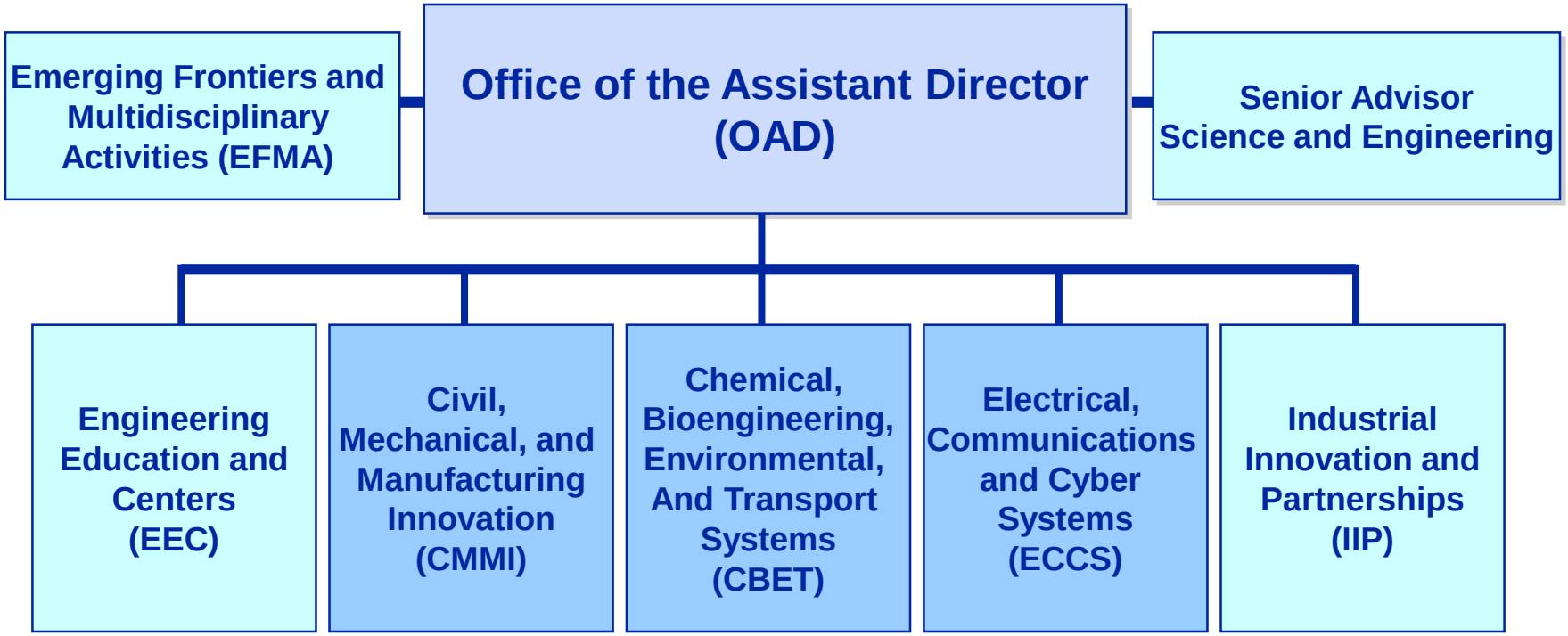
Notes: Biology includes Biological Sciences and Environmental Biology. Biology and Psychological Sciences exclude National Institutes of Health funding from the total amount of federal support.

Source: NSF/National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FY 2015

NSF is Organized Around Research Topics



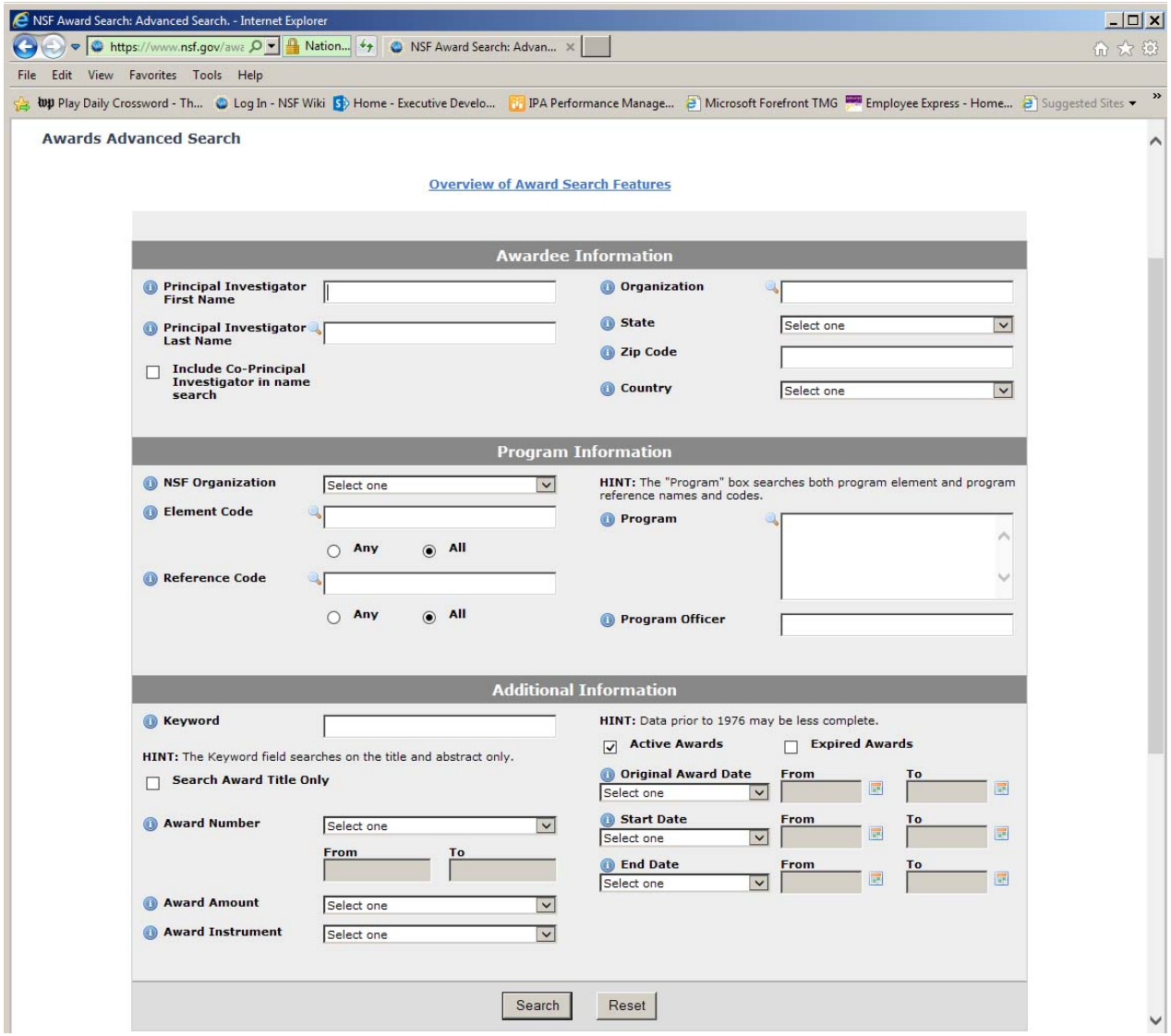
ENG Organization



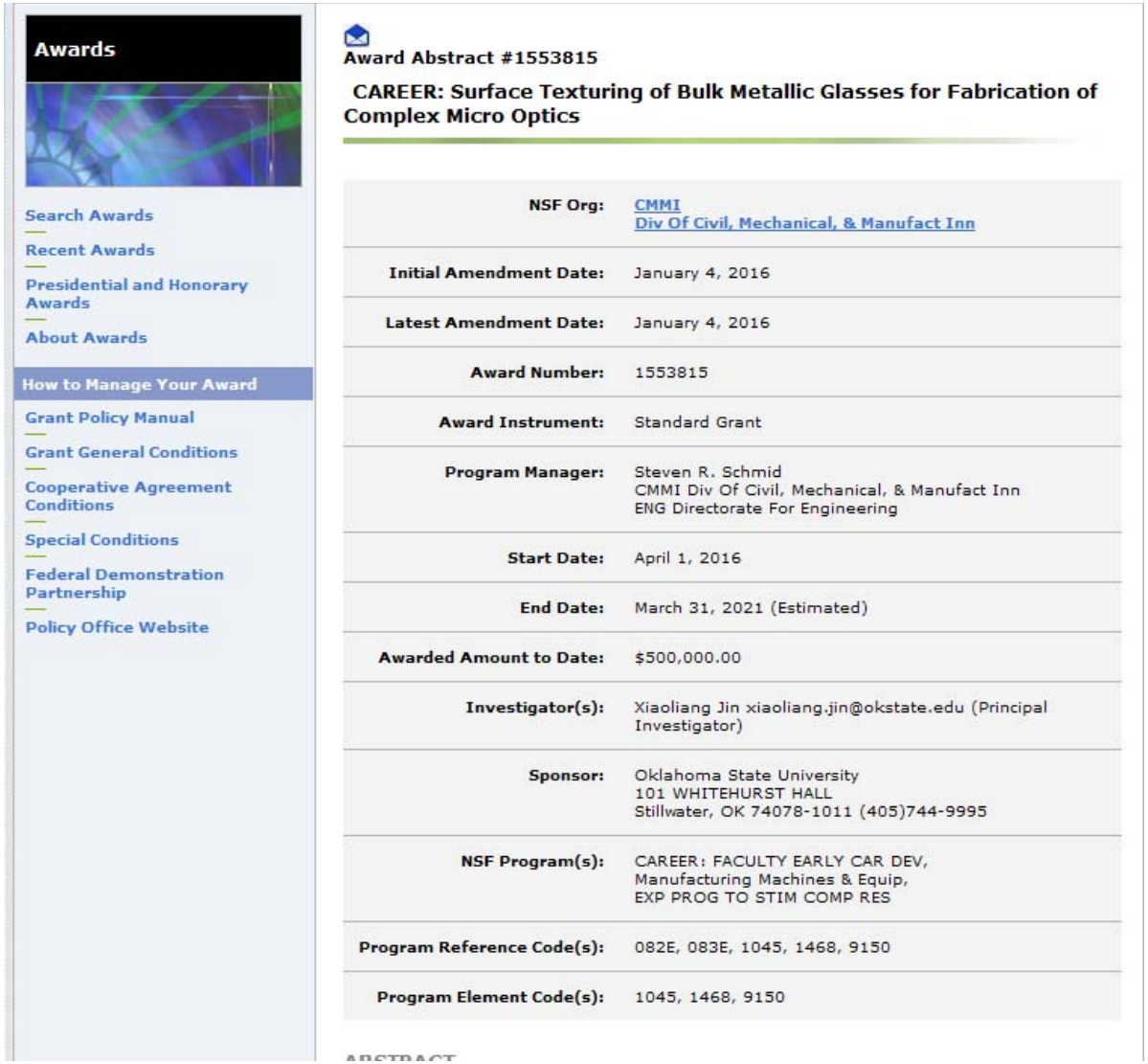
The Next Step

- Look at NSF's web site: www.nsf.gov
  - Check out research programs
  - Read what research topics they support
  - Abstracts for recent awards
  - Workshop reports
- Email the appropriate program officer(s) and ask if your research objective fits their program
  - One page summary (max)

Award Search Capabilities



Award Data



Awards

Search Awards
Recent Awards
Presidential and Honorary Awards
About Awards

How to Manage Your Award

Grant Policy Manual
Grant General Conditions
Cooperative Agreement Conditions
Special Conditions
Federal Demonstration Partnership
Policy Office Website

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

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

Should I Contact the Program Director?

- Yes!
  - Email your draft project summary to check whether your research objective fits within the program scope
    - » Very soon after you decide on your topic
    - » Many months (a year?) before the submission deadline
  - Discuss the CAREER proposal review process
    - » Expected range of topics/expertise on a panel

Questions You Shouldn't Ask a Program Director

- Will you fund my research?
- Is NSF interested in my topic?
- What hypothesis should I use?
- What research topic do you think I should work on?
- What is your program's funding rate?
- If I send a copy of my proposal to you, will you help me edit it?
- This is my last chance, what can I do?

Catch 22

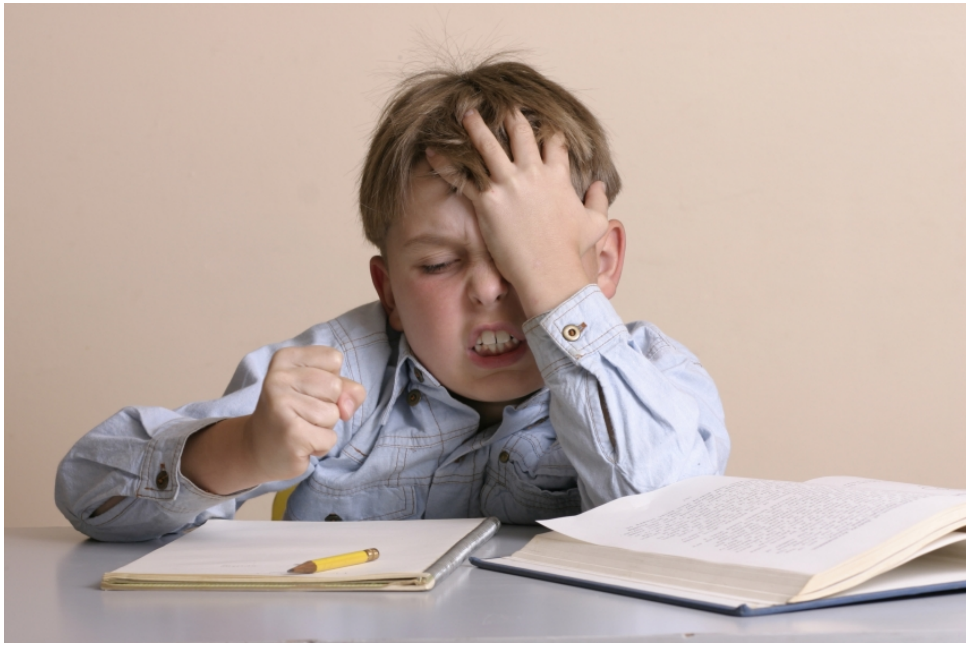
- My research doesn't fit in any single NSF program, how about joint submission/review?
  - Did you formulate a clear research objective?
  - Is your research objective too broad?
  - Do you want to consider focusing your scope?
- Suppose my research really does span multiple programs?
  - Contact all relevant program directors to ask about possible review scenarios

How Could Checking with the PD Help?

- 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

Program directors look forward to constructive meetings with PIs. Don't be afraid to reach out.

Writing the Project Summary



Project Summary

- The most important page in your proposal
  - PD uses it to group proposals for panel
  - Reviewers read it to judge their comfort reviewing the proposal
  - Reviewers first impression, which will I read first?

The Project Summary

- The most important statement is the statement of your proposed objectives
  - It should be at the very beginning
  - Do not begin with a weather report: “The sky is falling. Tools are breaking. Designs are failing…”
  - Do not begin with a state-of-the-union address: “The U.S. lags in the development of a strong manufacturing base…”
- Your Intellectual Merit and Broader Impact statements and the integration of your research and education activities are all important

The Summary Page – Three sections

- Overview
  - My long-term research goal is…
  - In pursuit of this goal, the research objective of this CAREER proposal is…
  - The research approach is…
  - My long-term educational goal is…
  - In pursuit of this goal, the educational objective of this CAREER proposal is…
  - The educational approach is…
- Intellectual Merit
  - New knowledge
- Broader Impacts
  - Societal, educational

Summary Template

Overview - My long-term research goal is… In pursuit of this goal, the research objective of this CAREER proposal is to test the hypothesis that the propensity of a tree to break is directly proportional to how many monkeys are in the tree. The approach will be to take a sample of ten trees and load them with monkeys until they break…

My educational goal is… In pursuit of this goal, the education objectives of this CAREER proposal are… The approach to accomplishing these objectives will be…

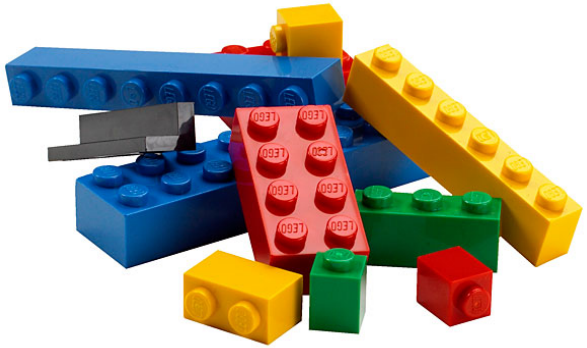
Intellectual Merit – It is important that we know how many monkeys can climb a tree before it breaks because this affects our perceptions of monkey procreation and… The Snerd Theory holds that tree size limits monkey procreation. This study challenges that theory with the notion that… If the objective hypothesis is correct therefore, it will transform our approach to…

Broader Impacts – Monkeys are used in medical research. By knowing how many monkeys can fit in a tree, we will be able to provide more monkeys for such research thereby advancing medical science more quickly and improving the quality of life. Also, by watching the monkeys get hurt when the tree breaks, graduate students will be less likely to climb trees, thereby increasing their probability of graduating.

Important Concept

The reviewers read your proposal, not your mind

Putting It All Together



Key Components

- Project Summary (1 page)
  - Overview
  - Intellectual Merit
  - Broader Impacts

- Project Description (15 pages)
  - Intellectual Merit
  - Broader Impacts
  - Integration of Research and Education
  - Results from Prior Support

What Else is Required?

- Budget
- Budget Justification
- Collaborators and Other Affiliations
- Department Letter
- Letters of Collaboration
- Data Management Plan
- Post Doc Mentoring Plan

Data Management Plan

- Proposals must include a supplementary document of no more than two pages labeled “Data Management Plan,” which may include:
  - the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
  - the standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
  - policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
  - policies and provisions for re-use, re-distribution, and the production of derivatives; and
  - plans for archiving data, samples, and other research products, and for preservation of access to them.

Mentoring for Postdoctoral Researcher

- If you propose funding to support a postdoctoral researcher, your proposal must include as a supplementary document a 1-page description of the mentoring activities that will be provided for such individuals.
- Proposed mentoring activities will be evaluated as part of the merit review process under the Foundation's broader impacts merit review criterion.
- Mentoring activities may include:
  - Career counseling;
  - Training in preparation of grant 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.

Follow the NSF Guidelines

- Proposal & Award Policies & Procedures Guide (PAPPG 18-1)
- Program Solicitation
  - NSF 17-537
- Budget guidelines
  - $500,000

PAPPG

- Provides guidance for preparation and submission of a CAREER (or any) proposal to NSF;
  - Allowable fonts, margins, page limits, bio format, etc.
  - Process and criteria by which proposals will be reviewed
  - Reasons why a proposal may be returned without review
  - Reconsideration process
  - Process for withdrawals, returns & declinations
  - Award process and procedures for requesting continued support
  - Budget line item definitions

Tips on Proposal Writing
Project Description

- Use approved fonts and line spacing
- Do not use figures or tables as filler - everything should contribute
- Everything should be legible - do not use 2-point font on figures or tables
- Be sure to explain exactly what is your contribution to the knowledge base
- Use only the required format
- Be sure to include a discussion of the intellectual merit and the broader impacts of the proposed work under the headings, "Intellectual Merit" and "Broader Impacts"—now required (PAPPG 18-1)

Tips on Proposal Writing

- Letters of collaboration must be in the specific one-sentence form noted in the solicitation
- Letters of recommendation are not permitted
- Departmental letter is required, 2 pages maximum
- Don’t cut and paste together your new proposal from old declined proposals
- Submit your proposal early, download it, proofread it and correct it if necessary before the deadline

Submitting Your Proposal

- Proposal submission may be via Fastlane or Grants.gov
- Fastlane submission is highly preferred because of automatic compliance checking for *some* requirements
  - » Hard Stops
    - late, missing components, page length
  - » Warnings
  - » Post submission verification

Review Criteria

Review Considerations for CAREER Proposals

- Review Criteria
  - Intellectual Merit
  - Broader Impact
- Add'l consideration
  - Integration of Research and Education

Intellectual Merit and Broader Impacts

- Both sections are required in the Project Description
  - In Project Summary too!
- Your proposal will be rated based on them
- But:
  - What are they?
  - What should you include?
  - How should they shape your proposal?

Intellectual Merit

- The Intellectual Merit is the potential that your research has to advance the knowledge base of the field of science or engineering
- Questions:
  - What is already known?
  - What is new?
  - What will your research add?
  - What will this do to enhance or enable research in your or other fields?
- Why is your research important for the advancement of your field?

Broader Impacts

- The Broader Impacts focuses on the potential benefits of the research and the educational outcomes to society and achievement of desired societal outcomes
- 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?

Five Key Review Elements for IM/BI

1. What is the potential for the proposed activity to:
   - advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   - 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?

Education and Outreach

- Undergraduate
  - Curriculum
  - Projects (REUs)
- Graduate
  - Curriculum
  - Conferences
  - Involvement with industry, national labs
- Networks, partnerships
- K-12 outreach (RETs)
- Museum projects
- Should not be a boiler plate, pick and choose

Integration of Education and Research

- Describe an integrated path that will lead to a successful career as an outstanding researcher and educator.
- No single approach
  - think creatively about the reciprocal relationship between the proposed research and education activities and how they may inform each other
- Reflect your own interests and goals
  - as well as the needs and context of your organization.
- A wide range of research/education activities may be appropriate
- You may wish to pursue an additional activity
  - Such as entrepreneurship, industry partnerships, or policy that enhances your research and education plans

Assessment and Evaluation

- PIs are strongly encouraged to describe how the impact of the educational activities will be assessed or evaluated
  - Helpful document: NSF publication 02-057, *The 2002 User Friendly Handbook for Project Evaluation*

Caution

Your goals, objectives and approach should drive the proposal, not the need for Intellectual Merit and Broader Impact statements.

The NSF Merit Review Process

Proposal Processing Timeline

Merit Review Process

- Process: ad hoc only, panel only, combination
- Reviews obtained from non-conflicted experts—at least three required, more is typical
- Ad hoc only: Program Director (PD) makes funding recommendation to Division Director (DD)
- Panel: Panel makes recommendation to PD who makes funding recommendation to DD
- DD concurs on recommendation—end of process for declinations
- Division of Grants and Agreements makes an award

CAREER Proposal Review Process
ENG

- Usually a panel
- Typically 4 reviews submitted before the panel
  - All reviews and Panel Summary will be released to PI
- Panelists are senior academic researchers
- No quotas for # awards for a given program
- No threshold in terms of mean rating

Panel Summary

- Summarize the discussion
  - Should not be a merger of individual reviews
- Address strengths and weaknesses for all Review Criteria
- Aim to address causes rather than symptoms for weaknesses

Declined?

- Arrange a telephone meeting with PD
  - Wait at least a few weeks
- Discuss reviews
- Get advice for next steps
  - Revise and resubmit?
  - Different program?
- PD can often share insight about the panel discussion that may not be apparent in the written feedback
  - E.g., research objective not clear

Ethics

Conflicts of Interest

- All panelists required to inform PD of any proposals with which they are conflicted
  - Must sign NSF Form 1230P
    - » Potential conflicts
    - » No use of “insider” information
    - » Confidentiality
- PDs manage COIs
  - Avoid inviting collaborators, from same institution, …
  - No access to the proposal(s)
  - Leave the room during discussion
- Avoid bias

Confidentiality

- Hallmark of the NSF review process
- The Program Director does not share the identity of the reviewers to the PI or anyone not associated with the panel
- Reviewers are required to honor the code of confidentiality as well

Breach of Confidentiality

- Never divulge confidential information (NSF Form 1230P)
  - Ideas conveyed in proposals
  - Names of panelists
  - Names of PIs
  - Never use information that you received in confidence

Plagiarism is bad. Plagiarism from a proposal you reviewed is a breach of confidence—much worse!

Major Forms of Misconduct

- Plagiarism—uncited reproduction of the work of others
- Falsification—intentional misrepresentation of data or results (progress reports)
- Fabrication—making up data
- Double charges—billing the government twice for the same work, e.g., accepting funding from two different Federal agencies for the same work

Research Ethics

- Persons submitting proposals to the Federal government are held to high standards of conduct
- Misbehavior can be dealt with quite severely
  - PI may be barred from submission to NSF for 1-5 years
  - May be barred from proposal review
  - At least two cases of jail time (Grimes case, 41 months in Federal prison)
  - Maximum $250,000 fine, 5 years in prison

Multiple Proposal Submissions

- It is permissible to submit multiple proposals to do the same thing to different Federal agencies
  - But it is not permissible to submit the same proposal to multiple NSF units
- It is not acceptable to accept funding from more than one federal source for the same work

Getting Involved

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 winning proposal

How to Volunteer

- E-mail a brief (1-page) bio to the program director
- Indicate your areas of expertise, link to home page
- Unusual for early career faculty to serve on a CAREER panel
- Many PIs volunteer, not able to accommodate all

In Summary


Why am I taking this course?
What am I supposed to do with all of this information?
How can I prove I know it?

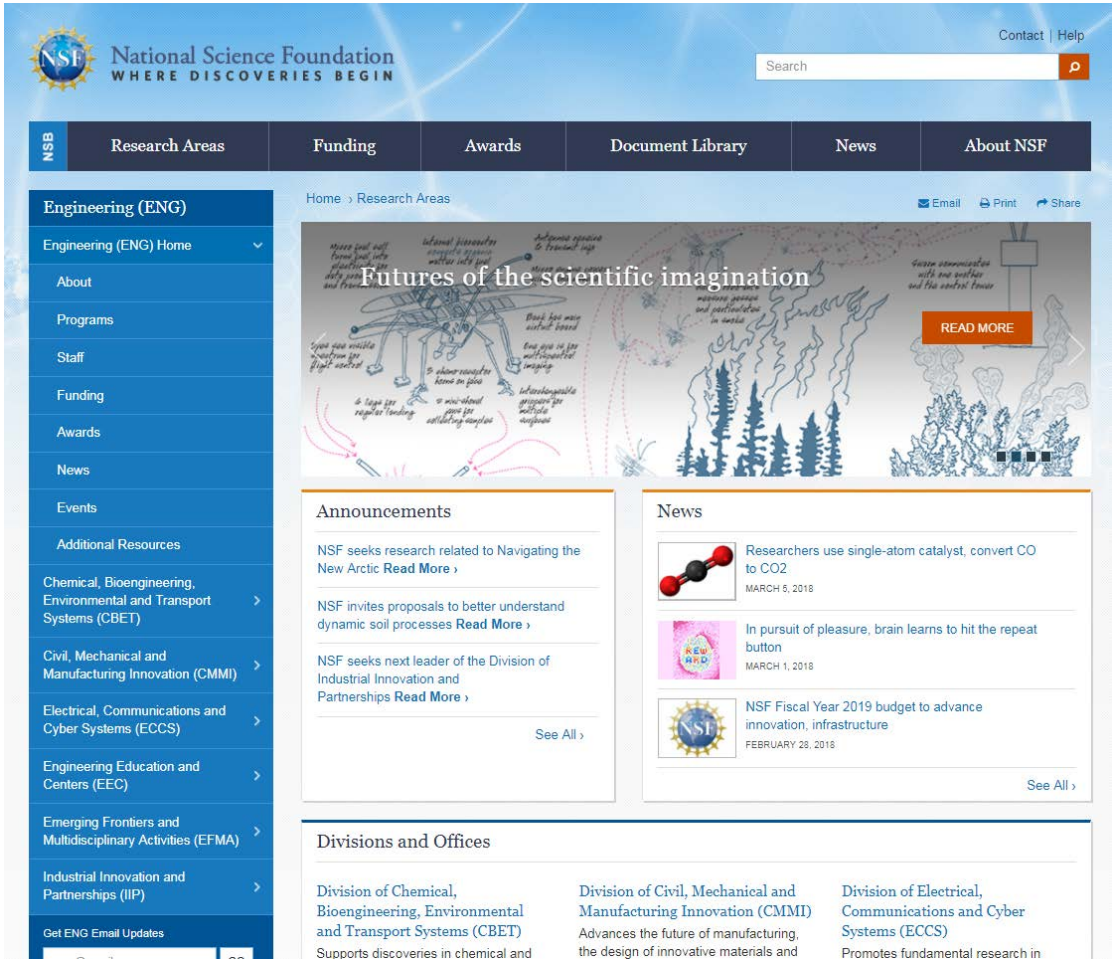
12 Steps to a Better Proposal

1. Know yourself - strengths/weaknesses
2. Know the program from which you seek support
3. Read the program announcement and PAPPG
4. Formulate clear and appropriate research and education objectives
5. Develop a viable plan to accomplish your stated objectives
6. State your objectives up front in your proposal

12 Steps to a Better Proposal (cont'd)

7. Frame your project around the work of others
8. Grammar and spelling count
9. Format and brevity are important
10. Know the review process
11. Proof read the proposal before you submit it
12. Submit your proposal early and proofread it after you submit it

Questions?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Division of Electrical, Communications and Cyber Systems (ECCS)
Promotes fundamental research in

Mock Panels

- PD will facilitate each group of 8 – 10 panelists
  - Panel # on your badge
- Discuss each proposal
  - 6 proposals/3.5 hours
- Place each proposal in one of three bins
  - Primary Consideration
  - Secondary Consideration
  - Do Not Consider
- Write Panel Summary
- Ask PDs questions

Assignments

	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6
Panelist 1	R_L			R_S		
Panelist 2			R_S			R
Panelist 3	R				R_L	
Panelist 4		R_L		R		
Panelist 5	R_S				R	
Panelist 6		R		R_L		
Panelist 7			R_L		R_S	
Panelist 8		R_S				R_L
Panelist 9			R			R_S

R_L	Reviewer, Lead	Reviewer (reads proposal, submits review) who leads the discussion the day of the panel.
R	Reviewer	Reads proposal and submits written review before panel convenes.
R_S	Reviewer, Scribe	Reviewer (reads proposal, submits review) who writes panel summary the day of the panel.