

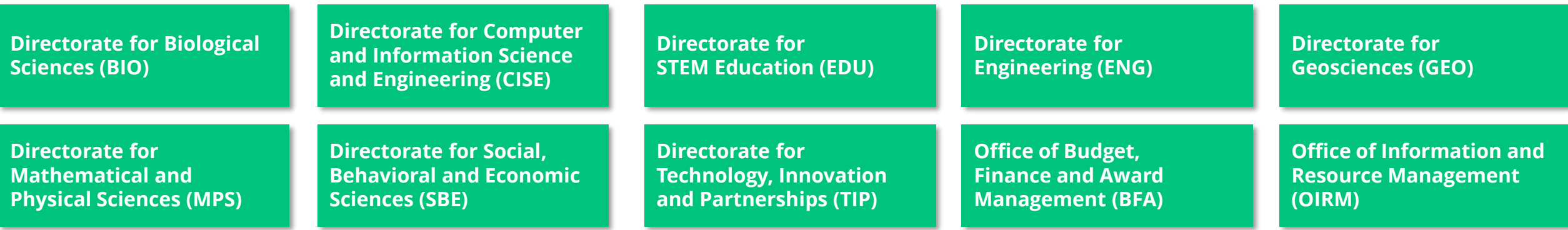
NSF Funding Opportunities

Jaroslaw (Jarek) Majewski, Ph. D.,
Program Director in Molecular and Cellular Biosciences Division, Directorate of Biology,
cluster leader in Molecular Biophysics.

Idaho, Aug. – Sept., 2023.

Quick NSF Overview





BIO Structure

Directorate for Biological Sciences (BIO)

Division of Environmental Biology (DEB)

- Ecosystem Sciences
- Evolutionary Processes
- Population and Community Ecology
- Systematics and Biodiversity Science

Division of Integrative Organismal Systems (IOS)

- Behavioral Systems
- Developmental Systems
- Neural Systems
- Physiological and Structural Systems
- Plant Genome Research Program

Division of Molecular and Cellular Biosciences (MCB)

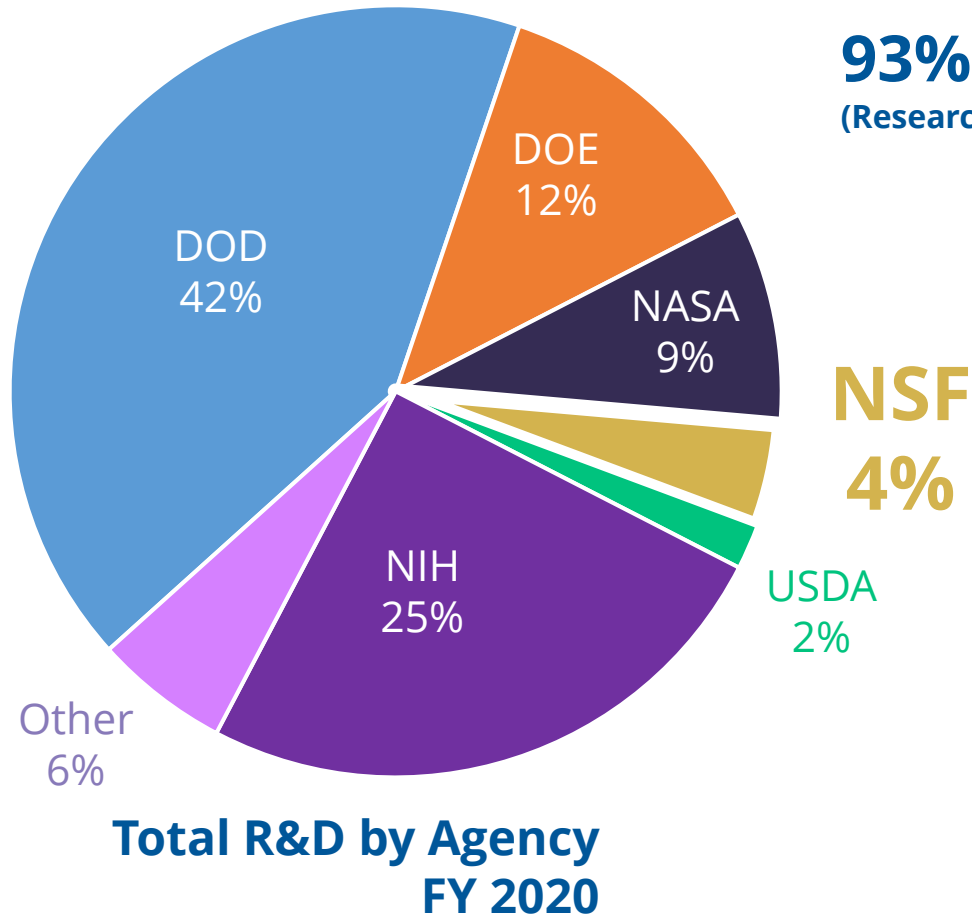
- Cellular Dynamics and Function
- Genetic Mechanisms
- Molecular Biophysics
- Systems and Synthetic Biology

Division of Biological Infrastructure (DBI)

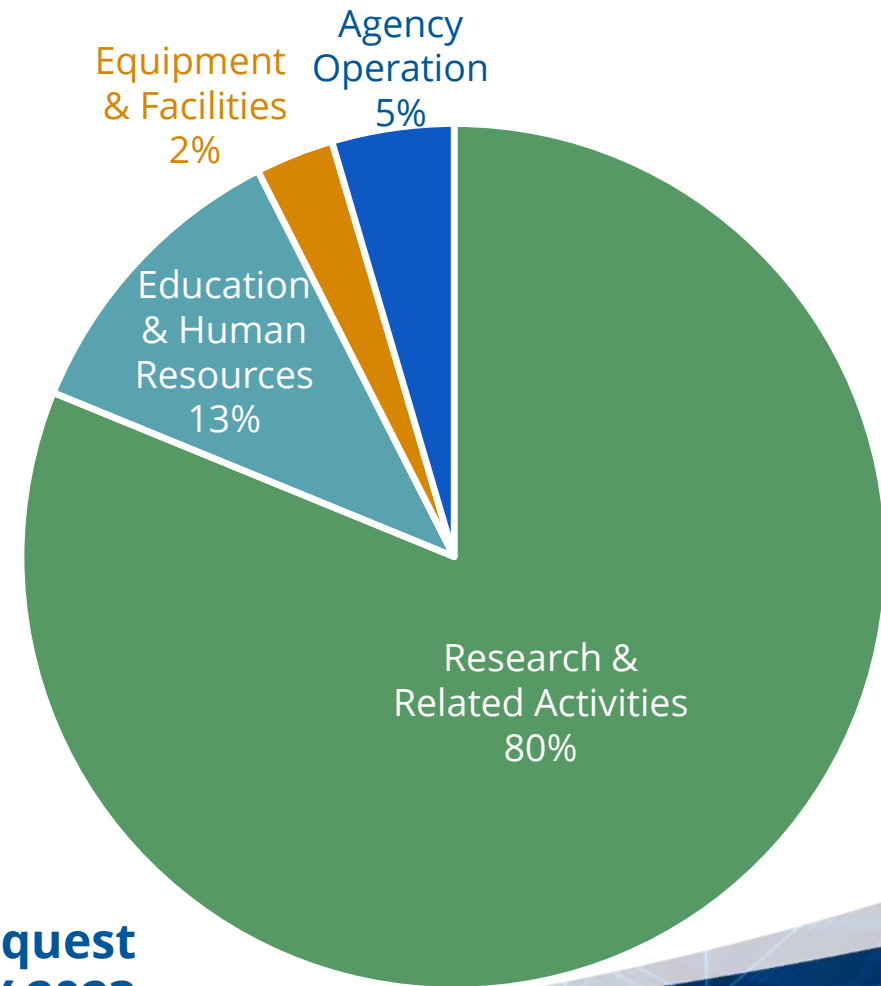
- Research Resources
- Human Resources
- Centers, Facilities, and Additional Research Infrastructure



NSF is a very small agency... ..with a **big impact!**



93% of our budget goes out the door as grants
(Research & Related Activities + Education & Human Resources + Equipment & Facilities)



NSF by the Numbers



\$8.8B FY 2022 Enacted



93% funds research, education, and related activities



\$1.5B for STEM education



\$181M to seed public/private partnerships*



253+ NSF-funded Nobel Prize winners



43K+ proposals evaluated



11K+ awards funded/year



2K funded institutions



318K people funded



Investigator-driven Science



Infrastructure



Centers and Institutes



Researchers



Trainees and Students



Industry and Others



Types of Proposals and Solicitations

- Solicited vs. unsolicited proposals
 - Solicitation describes a specific funding program, including some that are general in topic (i.e., BIO core programs)
 - Other proposals are submitted in response to the general NSF Proposal & Award Policies & Procedures Guide (PAPPG)
- Dear Colleague Letters (DCLs)
 - Usually announce a focus on an existing funding opportunity on a specific program emphasis
- Deadlines vs. Target Dates
 - Firm vs. flexible
 - No deadlines for some programs and some proposal types (small grants, workshops, supplements)



Merit Review Overview



Merit Review Process

1. No Deadline/Deadline/Target Date/



2. Ad hoc review and/or



3. Panel



4. Program Director makes recommendation

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION					
NSF 09-543 094671				FOR NSF USE ONLY	
FOR CONSIDERATION BY NSF ORGANIZATION (SPTS) (select by proposal title)				NSF PROPOSAL NUMBER	
EAR - PETROLOGY AND GEOCHEMISTRY				1119224	
DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNSF (Use internal numbering system)	FILE LOCATION
01/06/2011	3	0803000 EAR	1973	94011712	
EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)	IS THIS PROPOSAL A REPLY TO A PREVIOUS AWARD NO. IF YES IS IT A REPLY TO AN ACCOMPLISHMENT BASED FUNDING AGENCY? YES NO IS IT YES, LIST AGENCY(S)	IS THIS PROPOSAL, BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES NO IS IT YES, LIST AGENCY(S)			
481278531					
NAME OF ORGANIZATION TO WHICH AWARDS SHOULD BE MADE	ADDRESS OF AWARDING ORGANIZATION, INCLUDING 8-DIGIT ZIP CODE				
University of Oregon Eugene	University of Oregon Eugene 5219 University of Oregon Eugene, OR, 97403-1226				
AWARDING ORGANIZATION CODE, if exists					
003221900					
NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE	ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 8-DIGIT ZIP CODE				
PERFORMING ORGANIZATION CODE, if exists					
SEARCHING ORGANIZATION (Check All That Apply)	<input type="checkbox"/> SMALL BUSINESS	<input type="checkbox"/> SECURITY BUSINESS	<input type="checkbox"/> IF THIS IS A PRELIMINARY PROPOSAL, SEE SPS 10.2 FOR DEFINITION		
<input type="checkbox"/> FEDERAL ORGANIZATION	<input type="checkbox"/> FUTURE ORIENTED ORGANIZATION				
TITLE OF PROPOSED PROJECT: Testing models of magma generation in warm-slab subduction zones: A case study of volcanics in the Cascade arc					
REQUESTED AMOUNT \$	PROPOSED DURATION (in months)	REQUESTED STARTING DATE	IS THIS RELATIVE TO A PRELIMINARY PROPOSAL NO. IF APPLICABLE		
295,274	24	06/01/12			
CHECK APPROPRIATE BOXES IF THIS PROPOSAL INCLUDES ANY OF THE FOLLOWING:					
<input type="checkbox"/> DISCLOSURE OF EMPLOYMENT ACTIVITIES (SPS 10.1.4)		<input type="checkbox"/> HUMAN SUBJECTS (SPS 10.7) Human Subjects Assurance Number			
<input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION (SPS 10.1.4.1)		<input type="checkbox"/> NATIONAL COOPERATIVE ACTIVITIES: COLLABORATION INVOLVED (SPS 10.2.3)			
<input type="checkbox"/> HAZARDOUS MATERIALS (SPS 10.2.2)		<input type="checkbox"/> HIGH-RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (SPS 10.1.1)			
<input type="checkbox"/> VERTEBRATE ANIMALS (SPS 10.1.1.2) (SEE ALSO SPS 10.1.1)					
PI'S AREA VETERINARIAN ASSURANCE NUMBER					
PI'S DEPARTMENT Department of Geological Sciences		PI'S POSTAL ADDRESS Eugene, OR 97403 United States			
PI'S PHONE NUMBER 541-346-4892		High Degree	Yr of Degree	Telephone Number	Electronic Mail Address
PI'S NAME (TITLE) Paul Wallace		PhD	1991	541-346-0985	pwallace@uoregon.edu
CO-PI'S					
CO-PI'S					
CO-PI'S					
CO-PI'S					



Note that this varies across NSF

Merit Review Criteria

- **Intellectual Merit (IM):**
the potential to advance knowledge
- **Broader Impacts (BI):**
the potential to benefit society and contribute to the achievement of specific, desired societal outcomes



5 Review Elements

IM

BI

1. Will the work advance knowledge, and benefit society?
2. Is the work creative or potentially transformative?
3. Is the work plan sensible, and how will they know if they're successful?
4. Is the team qualified?
5. Do they have adequate staff support and facility resources?



Broader Impacts: Benefitting Society

**Teaching, training,
and learning
(undergrads +
grad students)**

**Broaden
participation of
underrepresented
groups**

**Build or enhance
partnerships
(internationally,
or with other
agencies)**

**Broad
dissemination to
enhance scientific
+ technological
understanding**

**Enhance
infrastructure
(labs, equipment,
+ work
in developing
countries)**

**Local impacts
(policies @ state +
local level)**



NSF Overview



*2415 Eisenhower Ave., Alexandria, VA 22314
On Yellow Metro Line, 15 min. on Metro from National Mall.*



NSF's 10 Big Ideas



- Future of Work at the Human-Technology Frontier
- Growing Convergence Research
- Harnessing the Data Revolution
- Mid-scale Research Infrastructure
- Navigating the New Arctic
- NSF 2026
- NSF INCLUDES
- Quantum Leap
- Understanding the Rules of Life
- Windows on the Universe





Funding

NSF National Science Foundation (US) | https://www.nsf.gov/funding/index.jsp

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Enter Your Search Term







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A-Z Index

Use the [A-Z Index](#) to find funding opportunities by title.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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-  [Computer and Information Science and Engineering](#)
-  [Integrative Activities](#)
-  [Crosscutting and NSF-wide](#)
-  [International Science and Engineering](#)



PLEASE READ BEFORE YOU START!!!

The screenshot shows the NSF website interface. At the top left is the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". A search bar is located at the top right. Below the header is a navigation menu with tabs for "Research Areas", "Funding", "Awards", "Document Library", "News", and "About NSF". The "Document Library" tab is selected, and a sidebar on the left lists options: "All Documents", "National Center for Science and Engineering Statistics (NCSES)", "Obtaining Documents", and "Search Documents". The main content area displays the title "Proposal & Award Policies & Procedures Guide (PAPPG), February 2019" with available formats (HTML | PDF), document type, and number (nsf19001). It also includes a public comment and document history. The footer contains links for "National Science Foundation", "Research.gov", "News", "Funding & Awards", "Document Library & About NSF", "About Services", and "NSF Award Highlights".

https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf19001



Types of funding mechanisms

- Research (see [GPG Chapter II](#)); response to general solicitation
- CAREER; for young investigators
- RAPID (see [GPG Chapter II.D.1](#)); In response to a severe urgency including quick-response research on natural or anthropogenic disasters and similar unanticipated events.
- EAGER (see [GPG Chapter II.D.2](#)); EARly-concept Grants for Exploratory Research Proposals- usually risky/high return-need to consult PD before applying
- Ideas Lab (see [GPG Chapter II.D.3](#)); specific solicitation
- Conference (see [GPG Chapter II.D.9](#));
- Equipment (see [GPG Chapter II.D.6](#));
- International Travel (see [GPG Chapter II.D.10](#));
- Facility/Center (see relevant funding opportunity); or
- Fellowship (see relevant funding opportunity).



Other types of funding mechanisms

Dear colleague letters; special opportunities - usually short time windows

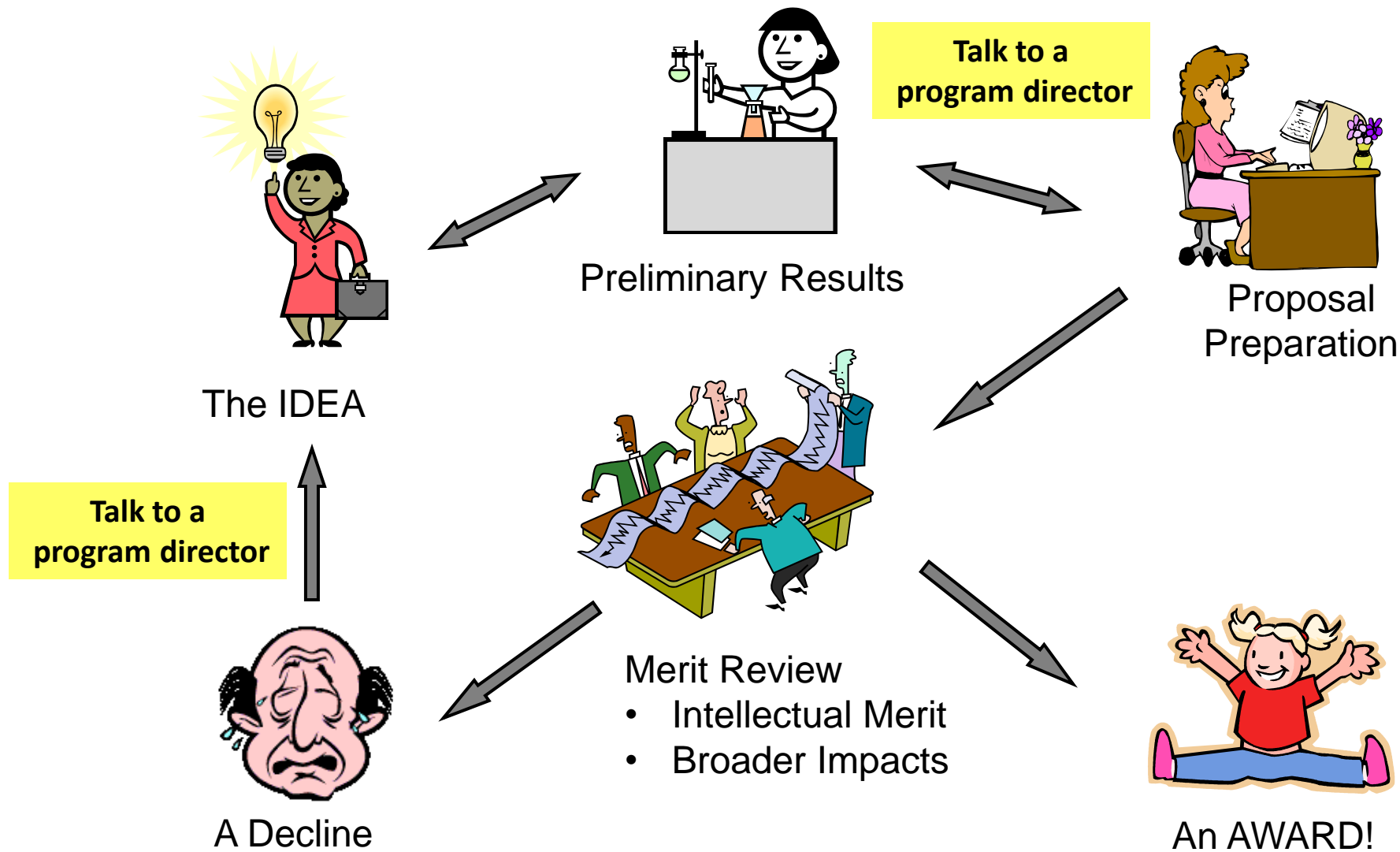
e.g. **NSF 19-058** Dear Colleague Letter: UKRI/BBSRC- NSF/BIO Lead Agency Opportunity in Bioinformatics, Microbiome, Quantum Biology and Synthetic Biology/Synthetic Cell

Specific solicitations; focused topic with additional requirements

e.g. Quantum leap challenge institutes (NSF 19-559)



The Proposal cycle





Merit Review

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?



Panel and ad-hoc review

Each proposal is reviewed at least by three reviewers

All reviewers are NOT experts in your field

Every proposal is first described by two-three panelist and then it is discussed by the whole panel and ranked by the panel

After all proposals are discussed, the rankings are re-discussed to ensure that relative ranking of the proposal are justified

Panel rankings are NOT funding recommendations, they are advisory to PDs who will make funding decisions.



Project Summary (very important)

- First page that program directors and reviewers will read
- **What:** Clearly state the research objectives first
- **Why:** Is this research needed? (Intellectual Merit)
- **How:** Describe the major research tasks and how broader impacts will be met
- Broader Impacts **MUST** be explicitly addressed in the Project Summary and the Project Description or your proposal will be disqualified and **returned without review**

This document should NOT be a simple summary of the proposed research activities.



How to develop a good research plan?

- **Ask yourself and convince reviewers**
 - What do you intend to do that others want to know?
 - Why is the work important, innovative and exciting?
 - What has already been done and why is your way better?
 - How are you going to do the work to answer the question uniquely?
- **Prepare yourself and demonstrate knowledge**
 - Literature survey and discussions with others
 - Get preliminary data for research and education components
 - If you do not have access to the best facilities, who will you collaborate/partner with?



Strengths of highly competitive proposals

- Novel idea/research question
- Well balanced feasibility and boldness
- Research plan addresses the question(s)
- Well justified
- Well written
- The PI is qualified
- Meaningful collaborations are in place (if needed)
- Facilities are available (at the institution or through collaboration)



Most common scientific mistakes

- Work is too close to what has been done before - i.e., Incremental advance
- Project has too large a scope or is too narrowly focused to be exciting
- Proposed methods/resolution/research plan are not likely to yield results that will address the stated goals of the project
- The experiment/theoretical/analytical design is flawed or alternative interpretation/analysis of data is ignored
- Resources not available or PI does not have demonstrated expertise in it



Comments you don't want to see in reviews

- This is a solid but not particularly original study that stomps on old ground (**incremental**)
- The results of this study will have **limited impact** in the field
- The PI has **not been very productive** either during or since his/her Ph.D.
- This proposal is **naive/overly ambitious**
- The PI has **not demonstrated expertise** in this methodology
- Experimental design will not address the question
- Potential **pitfalls and alternate strategies** are not described
- Alternate interpretation of data is ignored



Educational component- critical for success

- Leverage activities at your institution that have relevance to your research
- Demonstration of previous results with successful education activities is a plus
- Who will benefit from the proposed activities?
- How will you know if these activities are having impact?
(Assessment plan)



Most common mistakes

Education component is generic and what is already expected of any PI in your field, e.g. one more student is not enough

Unrealistic goals- "this work will reshape K-12 education in the state of X"

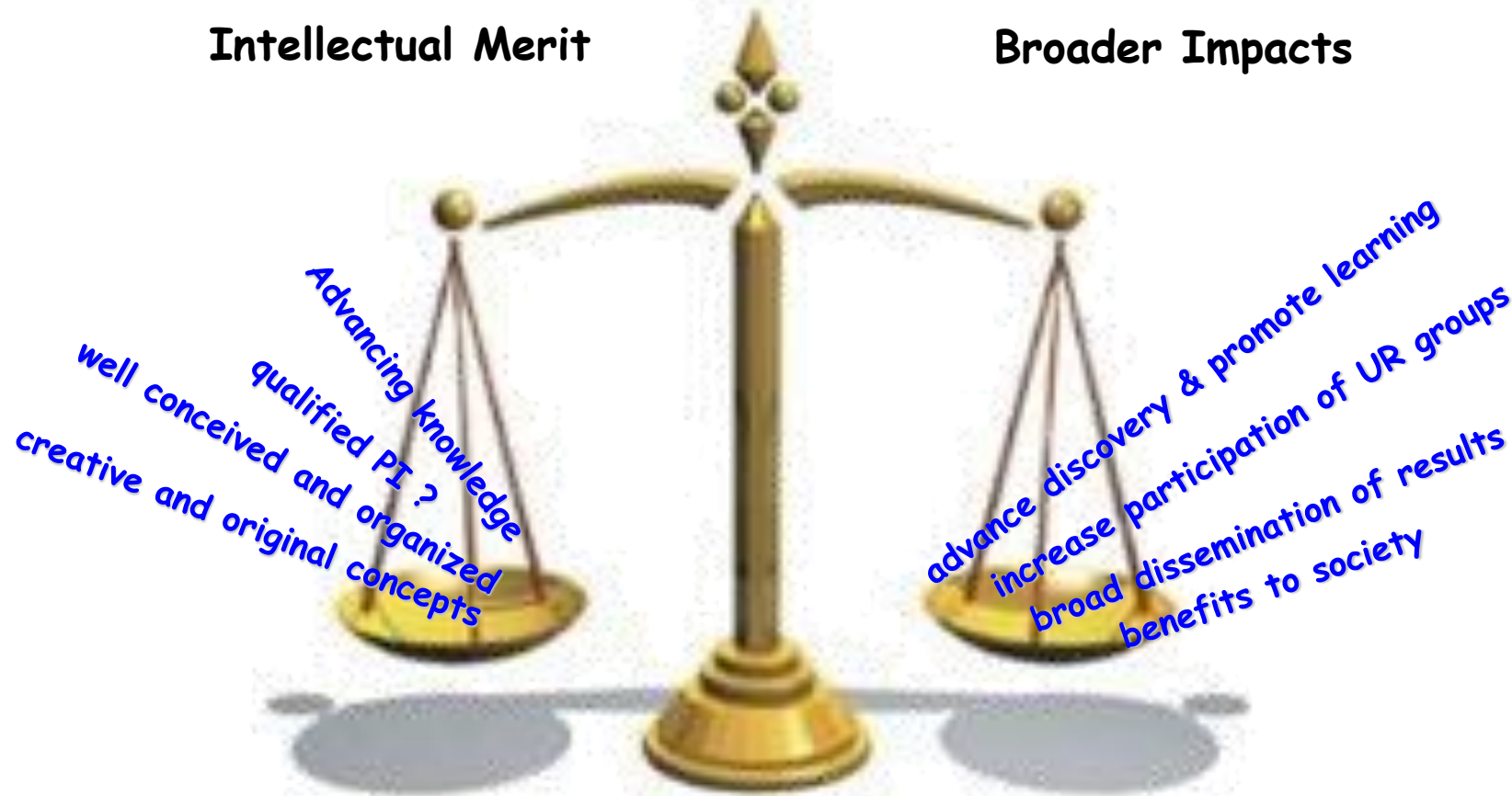
Reinventing the wheel, one more blog, another website

Lack of understanding what is effective in education -literature search helps



Intellectual Merit

Broader Impacts





Personnel and budgets

- Request for support of other senior personnel, consultants, or sub-awards is allowed, their roles must be described in the project description
- Co-PIs are allowed (except some special programs such as CAREER) - **subject to change!**
- Programs may support buy-out of academic year time for teaching-intensive institutions (**check with your Program Director**)
- Some Programs may prefer to make awards with budget close to the anticipated *minimum size* (check with your Program Officer)
- Budget must commensurate with the scope of the proposed work (asking too little **will not** improve funding chances!)



- **Project Description or Facilities, Equipment, and Other Resources** must document the nature of all project collaborations, such as:
 - Intellectual contributions to the project
 - Permission to access a site, use instrumentation or facility
 - Offer to furnish samples / materials for research
 - Logistical support / evaluation services
 - Mentoring of U.S. students at a foreign site, if applicable
- Letter should consist of a single-sentence statement of collaboration:
 - "If the proposal submitted by Dr. [name of the PI] entitled [proposal title] is selected for funding by the NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description."
 - **Must NOT recommend or endorse PI or project**



Proposal appearance

- This is a proposal and not a manuscript - Know the difference
- All parts of the proposal have a role to play in communicating your ideas to the reviewers and PDs
- Do not compress the font or squeeze the margins (**RWR**) - use your 15 page Project Description wisely
- Embed the figures correctly and make it look good on the page
- Demonstrate that the care you took with this proposal will translate in the way you perform your research and manage your education program
- If you cannot write well - Take a class!



Decision

- **Peer Review**
 - **Content** of the review is **more important** than rating
 - Program Director analyzes: Fairness and substance of the reviews; any technical issues raised (can they be resolved swiftly and easily); reviewer's enthusiasm for the project; any additional feedback from reviewers/panels or other program officers; sometimes also clarification from the PI if needed
- **Portfolio Balance**
 - Research and education topics and their integration; potential for transformative impact in both; priority or timeliness of the area of research and systems; demographics of the PI population and diversity of institution types; stage of the career development of the PI; geographic diversity; gender balance; international partnerships



Declination is a fact of academic life

DO NOT !!!

- **Stay Calm and Do NOT Get Discouraged!**
 - Breathe deeply and read the reviews more than once
 - Ask others to interpret the reviews for you
 - Contact the PO **only after you have had time to digest** the feedback (Reviews, Panel Summary, PO Comment, Context Statement) and reflect on your next move
- **Resubmit only after addressing significant weaknesses**
 - Do you need more preliminary data?
 - What were the common themes in the reviews?
 - Is one component better than another?
 - Did anyone identify a significant strength that you could build upon for resubmission?
- **Avoid your Program Director**
- **Be timid**
- **Give up!**



Faculty early career development (CAREER) program

Next Deadlines:

- App. last week of July, 2024 (check the updates)
- Future Years: Fourth Monday in July
- check for updates and changes

IMPORTANT INFORMATION AND REVISION NOTES

- Eligibility requirements have been revised to clarify the required early-career status of applicants.
- Support for senior personnel other than the PI that is commensurate with a limited collaborative role in the project is now allowed in the budget of the proposal or of a sub recipient.



- The (CAREER) program is one of many NSF funding opportunities for **new investigators**
- All NSF programs support new investigators as part of regular (“core”) research competitions
- Approximately 20% of the research proposals from new investigators are submitted to the CAREER Program
- **It provides stable support** at a sufficient level and duration to enable awardees to develop careers not only as outstanding researchers but also as effective, committed educators
- Encourage faculty and academic institutions to **value and support the integration of research and education** in which the process of discovery stimulates learning and assures that research findings are quickly and effectively communicated in a broader context and to a large audience



PI eligibility

- Hold a doctoral degree by proposal deadline
- Be untenured and employed in at least 50% **tenure-track (or tenure-track-equivalent)** assistant professor position at an eligible institution as of October 1st following 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



Tenure track equivalency

Must meet all of the following requirements: (1) the employee has a continuing appointment that is expected to last the five years of a CAREER grant; (2) the appointment has substantial research and educational responsibilities; and (3) the proposed project relates to the employee's career goals and job responsibilities as well as to the mission of the department or organization.

The **Departmental Letter must affirm** that the investigator's appointment is at an early-career level equivalent to pre-tenure status, and **must clearly and convincingly demonstrate how the faculty member's appointment satisfies all the above requirements of tenure-track equivalency.**

Faculty members who are Associate Professors or in equivalent appointments, with or without tenure, are not eligible for the CAREER program. Faculty members who hold Adjunct Faculty or equivalent appointments are not eligible for the CAREER program.



Departmental letter

- Commitment to the PI's proposed CAREER research and education activities
- Description of how the PI's career goals and responsibilities mesh with that of the organization and department
- 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
- Statement indicating the PI's eligibility for the CAREER program



CAREER Educational/outreach

- 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



Overview: Submitting your CAREER Proposal

- 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 (BIO \$500k and up)
- Talk to Division contact(s) for more information (<https://www.nsf.gov/crssprgm/career/contacts.jsp>)
- For interdisciplinary proposals, contact all relevant Program Directors or Division contacts



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 letter of support from the Department Chair.
- The CAREER program's **aims are lofty** - CAREER awards are a lot of work.
- Have you demonstrated commitment to both research and education?



NSF Blogs

Many Divisions and Directorates have Blogs.
Useful way to find out what's new.



MCB ANNOUNCES A FUNDING OPPORTUNITY FOR BUILDING SYNTHETIC MICROBIAL COMMUNITIES FOR BIOLOGY

In recent years, researchers have assembled synthetic microbial communities that have novel compositions, genetics, and phenotypes, and they have used these communities to address both fundamental biological questions and a range of societal problems. To support such research efforts, NSF has released the [Building Synthetic Microbial Communities for Biology, Mitigating Climate Change, Sustainability and Biotechnology \(Synthetic Communities\) solicitation \(NSF 22-607\)](#).

The goal of this solicitation is to support research that addresses one or more of the three themes:

1. Define the underlying mechanisms or rules that drive the formation, maintenance, or evolution of synthetic microbial communities
2. Use synthetic microbial communities to address fundamental biological questions, including questions in molecular biology, cellular/organismal biology, ecology, and evolution
3. Build synthetic communities with biotechnology, bioeconomy, or environmental engineering applications

Full Proposal Deadlines: October 03, 2022 (due by 5 p.m. submitter's local time)

Anticipated Funding Amount: \$9,500,000



NSF.GOV

[BIO Home Page](#)

[MCB Home Page](#)

NSF BIO BLOGS

[BIO BUZZ](#)

[IOS in Focus](#)

[DEBrief](#)

[DBInfo - Blog of the Division of Biological Infrastructure](#)

[MCB Blog](#)





QUESTIONS?



Postdoctoral Research Fellowships in Biology

21-604

- Eligibility
 - U.S. citizen or permanent resident
 - You must not have served in postdoctoral capacity for more than 15 months prior to the application deadline
- Current areas
 1. Broadening Participation of Groups Under-represented in Biology
 2. Interactions of Genomes, and Environment and Phenotype
 3. Plant Genome Research Program
- Support provided for 2-3 years: \$69,000 plus \$15,000 allowance
- Deadline: See Solicitation (typically Nov or Dec)