

Welcome to NSF Day!



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Wednesday, April 19, 2017

NSF Mission

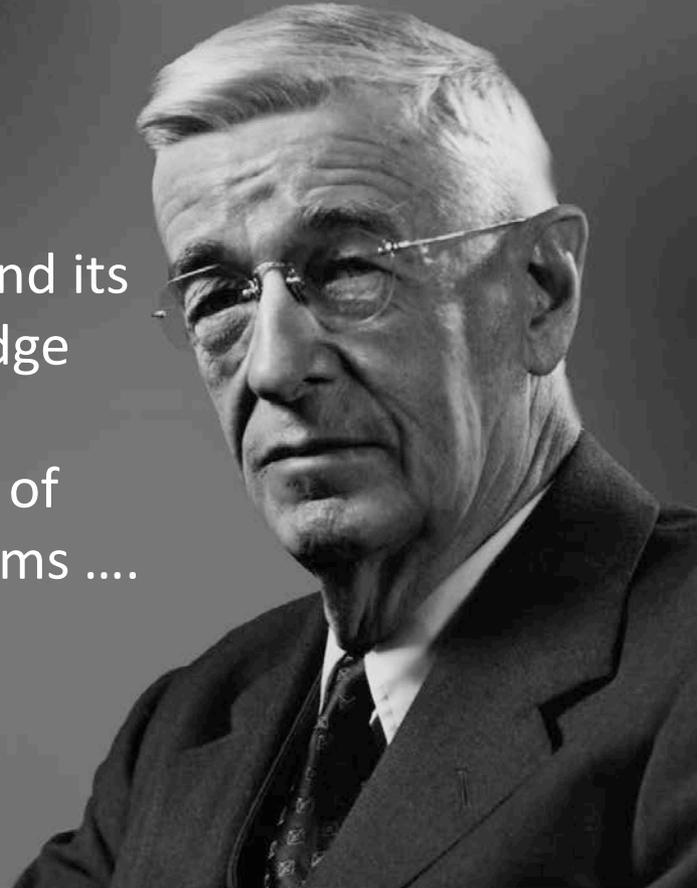
“To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...”

NATIONAL SCIENCE FOUNDATION

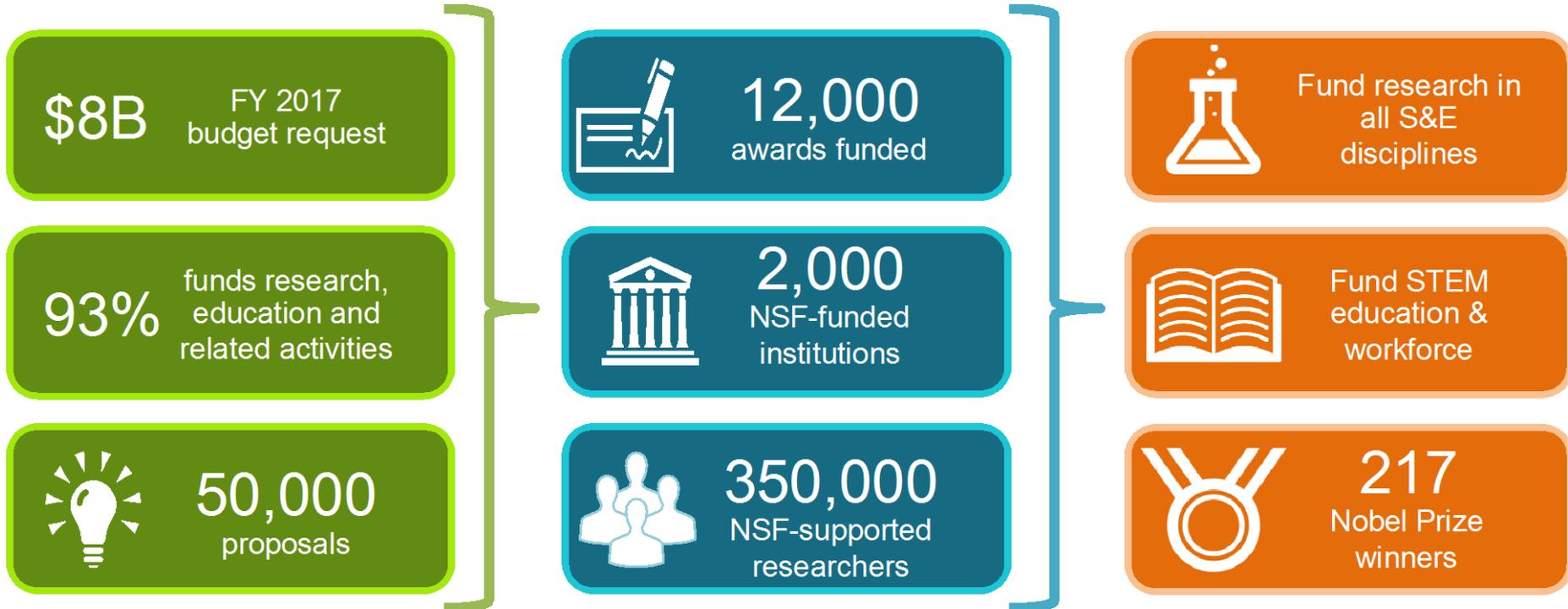


Basic research ... results in general knowledge and an understanding of nature and its laws. This general knowledge provides the means of answering a large number of important practical problems

- Vannevar Bush



NSF by the Numbers





UNITED STATES
NATIONAL
SCIENCE
FOUNDATION

FY **2017**
BUDGET
REQUEST TO
CONGRESS

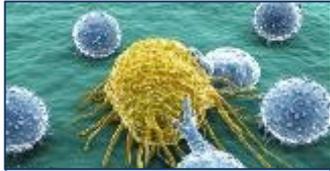
NSF FY 2017

Budget Request

Total: \$8 billion



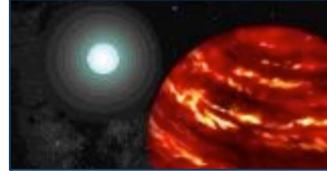
NSF Funds All Fields of S&E



**Biological
Sciences**



Engineering



**Mathematical &
Physical Sciences**



**Computer &
Information
Science &
Engineering**



**Geosciences
(including Polar
Programs)**



**Integrative
Activities**



**Education &
Human Resources**



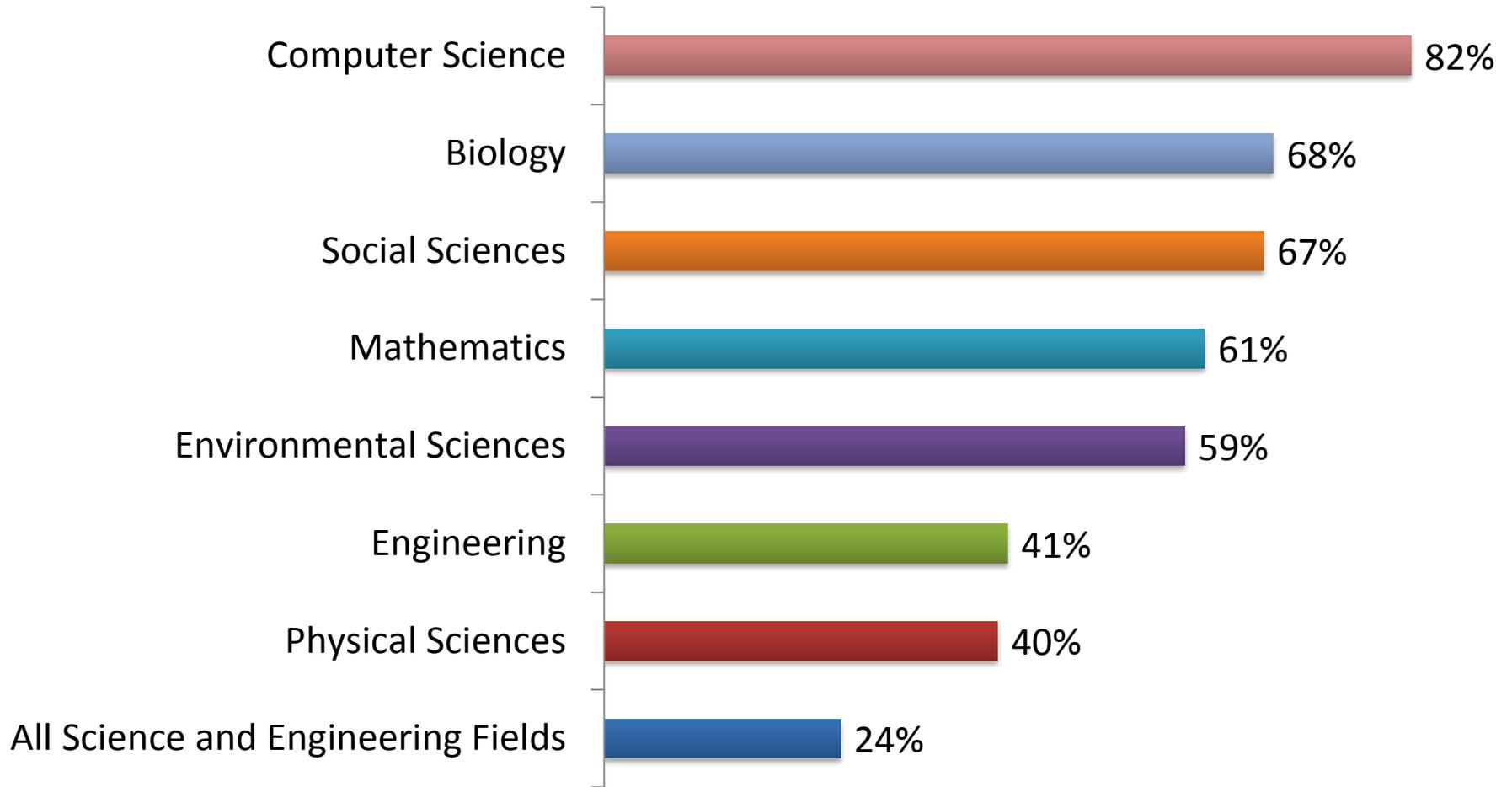
**Social, Behavioral
& Economic
Sciences**

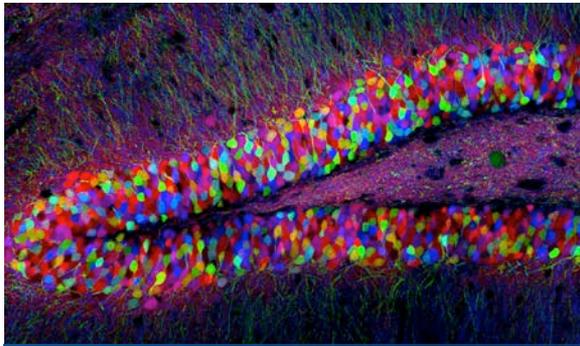


**International
Science and
Engineering**



NSF Support of Academic Basic Research in Selected Fields (as a percentage of total federal support)





Understanding the Brain



Food/Energy/Water



Risk and Resilience



Inclusion and Diversity



Clean Energy

Characteristics of NSF

Ubiquity

S&E advances are permeating the way we work, communicate, learn, and discover.

Urgency

Rapidly evolving and accelerating the pace of discovery and innovation, with profound societal and economic impact.

Engagement

The key strength and asset of NSF is the scientific community and the general public and their engagement.



1956
ASTRONOMY
TRANSFORMED



1981
FOUNDATION FOR
THE INTERNET LAID
BY CSNET*

1990
PLANT GENOMES
DECODED

2000
ROBOTS
SERVED
THE SICK

WHAT'S
NEXT



1957
SCIENTISTS FROM
AROUND THE
WORLD UNITED
BY IGY**

1985
SUPERCOMPUTING
CENTERS BOOTED UP

1995
DOPPLER
RADAR
WENT MOBILE

2005
THE AFRICAN
SUPERPLUME
SURVEYED



1950s

1960s

1970s

1980s

1990s

2000s

2010s

1953
RESEARCH
STATISTICS
COLLECTED



1965
AMERICAN SIGN
LANGUAGE
CATALOGED

1970s
BAR CODES
POPULARIZED



1986
OZONE HOLE LINKED
TO CFCs

1990s
IMPROVED
INTERNET SEARCH


1998
LIGHT SHONE
ON DARK
ENERGY



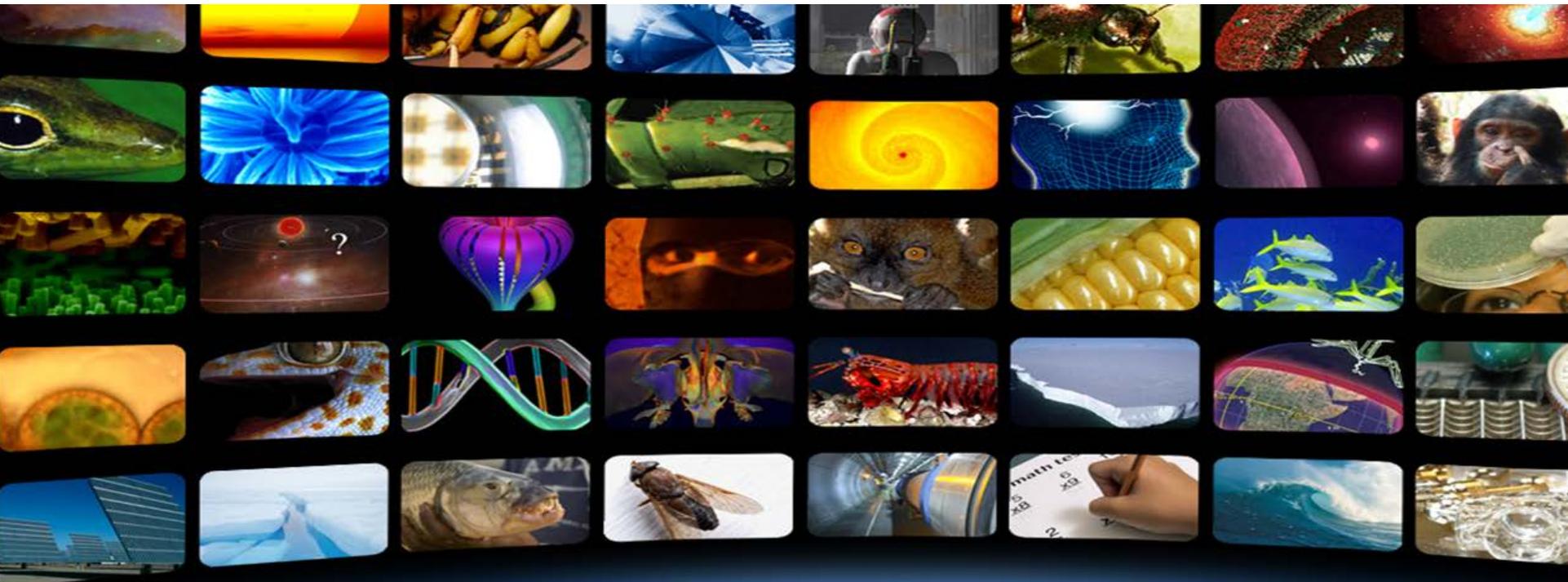
2009
CHANGES IN
OCEAN
CHEMISTRY
CONFIRMED

2010
ECONOMIC THEORY
MATCHED KIDNEY
TRANSPLANTS

2012
COMPUTERS
WENT
QUANTUM



Office of Legislative and Public Affairs (OLPA)



OLPA Mission

To advance awareness of NSF and its mission through strategic communications to external audiences



OLPA's Goals and Priorities

NSF engages the public
and
increases scientific literacy

OLPA strategically communicates the successes of NSF-funded research to broader audiences itself and by forging strategic partnerships.

- 1) Broaden awareness and understanding of NSF.
- 2) Communicate NSF's vital mission.
- 3) Highlight success stories.
- 4) Strengthen NSF's brand and image.
- 5) Leverage the expertise and credentials of NSF's leadership.



Congress Arc of Science

Showcased impacts of research on daily lives
and careers of Americans.



General Public

New Mediums

Monthly photo galleries show off NSF-funded science

The screenshot shows the Discover magazine website interface. At the top, the 'Discover' logo is prominently displayed in red, with the tagline 'SCIENCE FOR THE CURIOUS' above it. To the right of the logo is a search bar with the text 'Search DiscoverMagazine.com' and a 'SEARCH' button. Further right, there is a 'CURRENT ISSUE' section with a small image of the magazine cover and a 'SUBSCRIBE' button. Below the logo, the main headline reads 'Revealing the Invisible Universe' in a bold, black font. Underneath this headline, the date 'Tuesday, February 21, 2017' is visible. A sub-headline states 'Radio astronomy reveals celestial wonders hidden from the human eye.' Below the sub-headline is a horizontal photo gallery with seven small thumbnail images of astronomical phenomena, including galaxies and nebulae. The first thumbnail is selected, and a '1 of 10' indicator is shown to its right. The main content area features a large photograph of the Karl G. Jansky Very Large Array (VLA) in New Mexico, showing several large radio telescope dishes under a dark, cloudy sky. To the right of this image is a text block titled 'What Lies Beyond?' which discusses the history of radio astronomy and the role of the NSF. The text mentions that the NSF has invested in state-of-the-art facilities to advance the field of radio astronomy, starting with the NRAO. It also notes that the NSF supports radio telescopes from West Virginia to the Chilean Andes. Below the text, there is a caption: 'Pictured: The Karl G. Jansky Very Large Array in New Mexico.' At the bottom right of the image, there is a small 'FULL SCREEN' icon and the credit 'Andrew Clegg, NSF'. The National Science Foundation logo is located at the bottom right of the page.

Discover
SCIENCE FOR THE CURIOUS

Revealing the Invisible Universe

Tuesday, February 21, 2017

Radio astronomy reveals celestial wonders hidden from the human eye.

1 of 10

What Lies Beyond?

Though many cosmic phenomena are visible to us, much of the universe is hidden from view, obscured by gas and dust. After the serendipitous discovery of radio waves coming from the Milky Way's center in the 1930s, scientists realized radio waves, which have a longer wavelength than visible light, could reveal many aspects of cosmic phenomena not visible in other wavelengths.

For more than 60 years, the National Science Foundation (NSF) has invested in state-of-the-art facilities to advance the field of radio astronomy, starting with the nation's first astronomical observatory—the National Radio Astronomy Observatory (NRAO). Today, NSF supports radio telescopes from West Virginia to the Chilean Andes.

The following images offer a virtual tour of some of those telescopes and their discoveries.

Pictured: The Karl G. Jansky Very Large Array in New Mexico.

Andrew Clegg, NSF

National Science Foundation



High profile events

USA Science and Engineering Festival

April 2016



April 7-8, 2018



High profile events

2017 Washington Auto Show 2018?

Keynote by NSF Director.

Exhibition of NSF's funded autonomous vehicle, highlighting AI research and new technologies.

Rush hour drives on Capitol Hill with reporters and Hill staff.



Robust Social Media

Facebook



+426K likes

Twitter



+1.02M
followers

Instagram



+2,480
followers

YouTube



+8.5M views

Pinterest



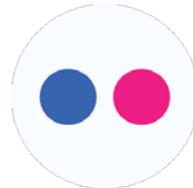
+31K views

LinkedIn



+45K
followers

Flickr



+528K views

Tumblr



+21K
followers

Medium



+18K views
36K followers

**Usage metrics since inception,
current as of March 2017**

www.nsf.gov/social



#NSFstories

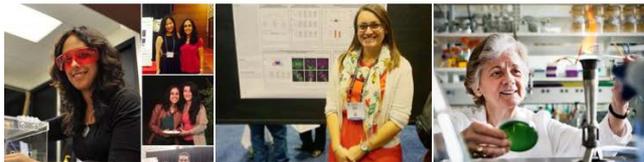


TOP POSTS



MOST RECENT

104 posts



108 likes

1w

nsgov #Repost from @bdrummond1018!

My lifelong passion for marine biology has taken me a lot of places. Three years ago I was bandaging penguin feet and cage diving with great white sharks in South Africa. Today I'm characterizing zebrafish embryos with genetic kidney problems that may provide insights to human breast cancer. My path has been far from linear, but what I do know for sure is that three years from today I'll still be a scientist. #NSFstories #nsgfrp #notredamescience #womeninSTEM

phenomenalphemale Thank you for sharing this! What a unique woman and cool #scientist

izm.I These features are so inspiring! Keep em coming!

getthepapersgetthepapers @dawnathenia

Add a comment...

bdrummond1018



Messaging Ten Big Ideas

RESEARCH IDEAS



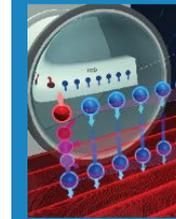
Harnessing Data for 21st Century Science and Engineering

Work at the Human-Technology Frontier: Shaping the Future



Navigating the New Arctic

Windows on the Universe: The Era of Multi-messenger Astrophysics



The Quantum Leap: Leading the Next Quantum Revolution

Understanding the Rules of Life: Predicting Phenotype



PROCESS IDEAS

Mid-scale Research Infrastructure



NSF 2050



Growing Convergent Research at NSF

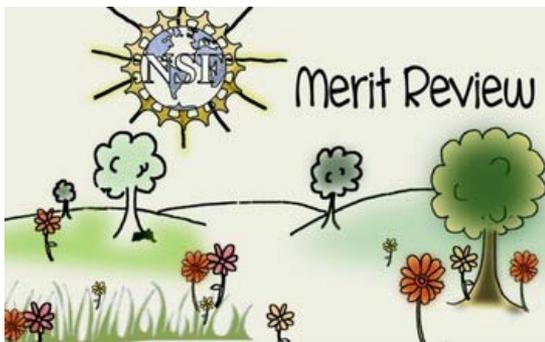
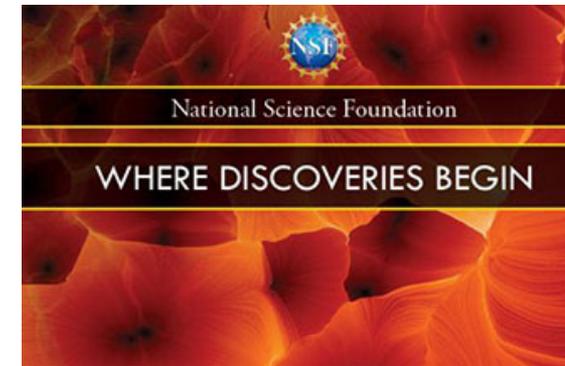
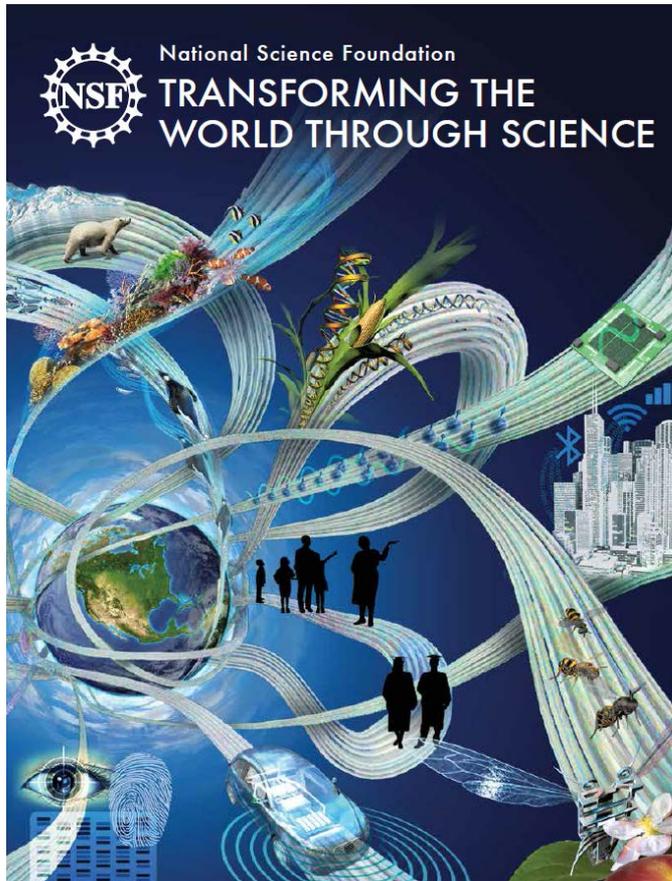


NSF INCLUDES: Enhancing STEM through Diversity and Inclusion





NSF Toolkit



<https://nsf.gov/about/congress/toolkit.jsp>



NSF's Organization



NSF Directorates and Offices

Biological Sciences (BIO)

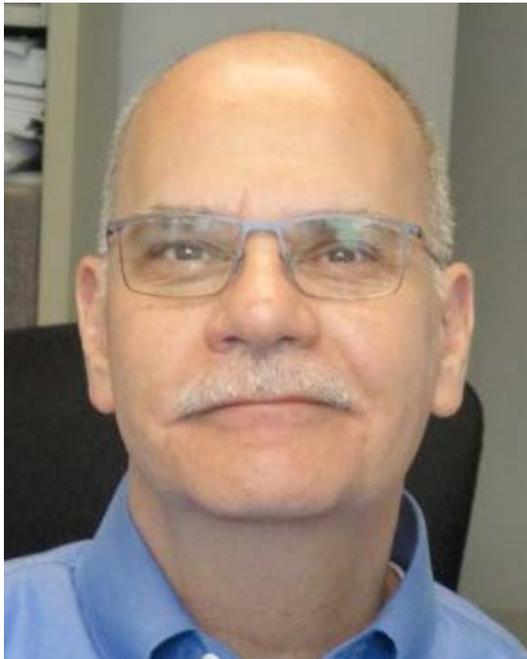


Biological Sciences (BIO)

Bill Zamer

Division of Integrative Organismal Systems (IOS)

wzamer@nsf.gov



IOS science advisor and program director in the Physiological and Structural Systems Cluster

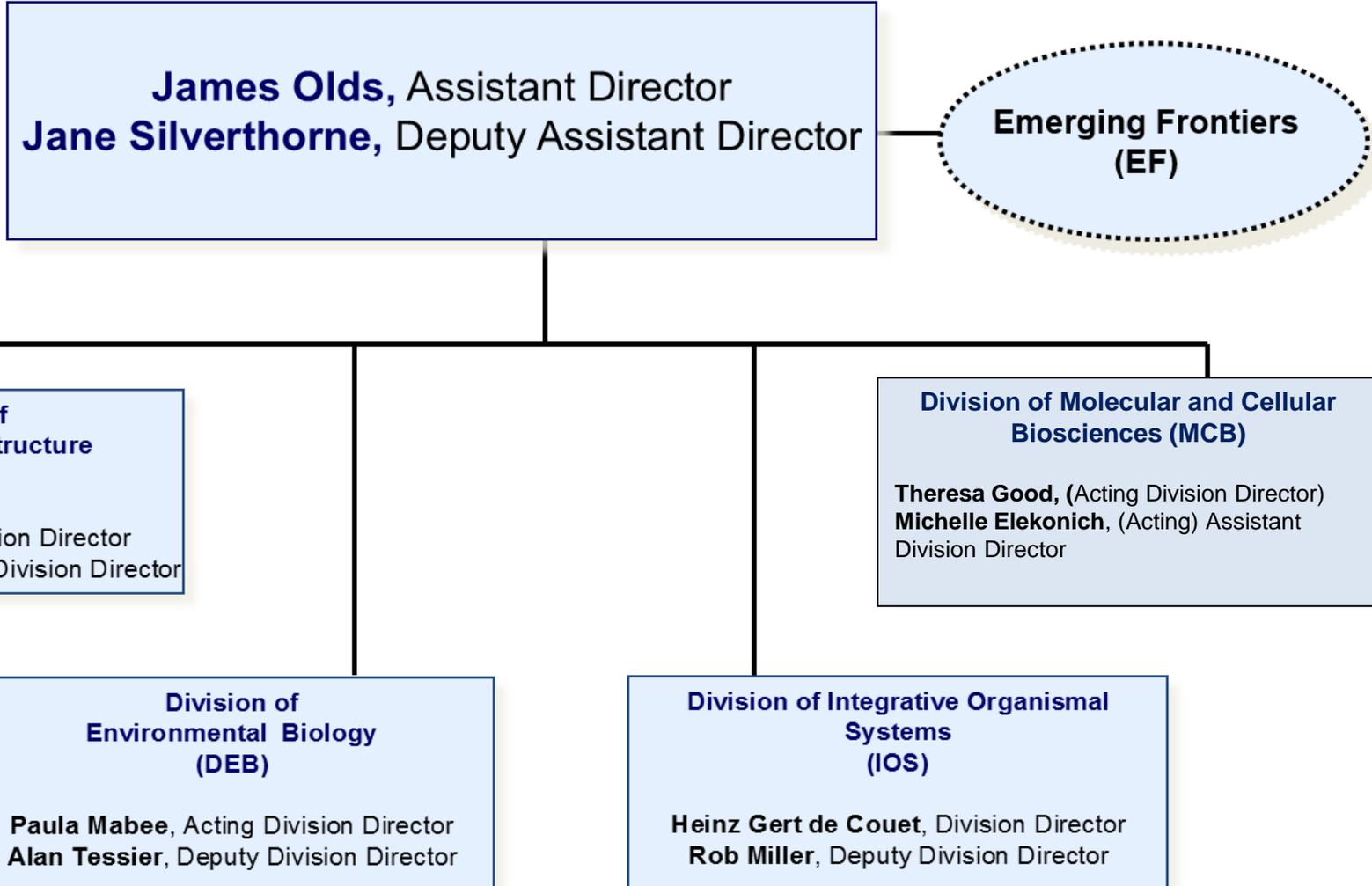
Chair, IOS Working Group managing Enabling Discovery through Genomic Tools (EDGE)

Co-Chair, Cross-Directorate Rules of Life Working Group, one of NSF's 10 Big Ideas

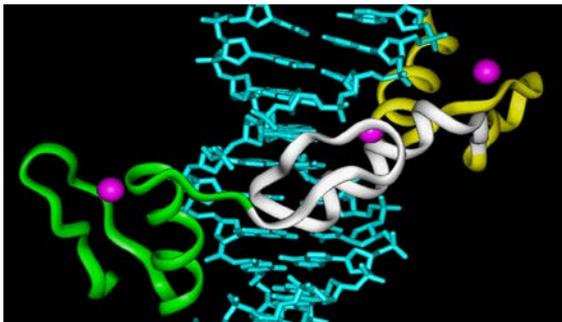
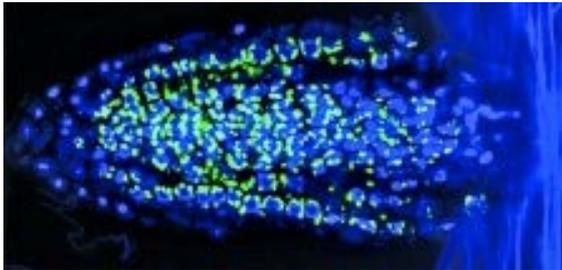
Washington Nationals fan



Biological Sciences (BIO)



Biological Sciences (BIO)



PRIORITIES

- Investigator-driven projects in all areas of biological research
- Brain Research through Advancing Innovative Neurotechnologies (BRAIN)
- Macrosystems Biology
- Plant Genome Research Program (PGRP)
- New: Enabling Discovery through Genomic Tools (EDGE)
- New: Understanding the Rules of Life, Predicting Phenotype
- New: U.S.-Israel Binational Science Foundation (BSF) Collaborative Proposals

NSF Directorates and Offices

Computer & Information Science & Engineering (CISE)



Computer & Information Science & Engineering (CISE)

Yan Solihin

Computer and Networked Systems (CNS)

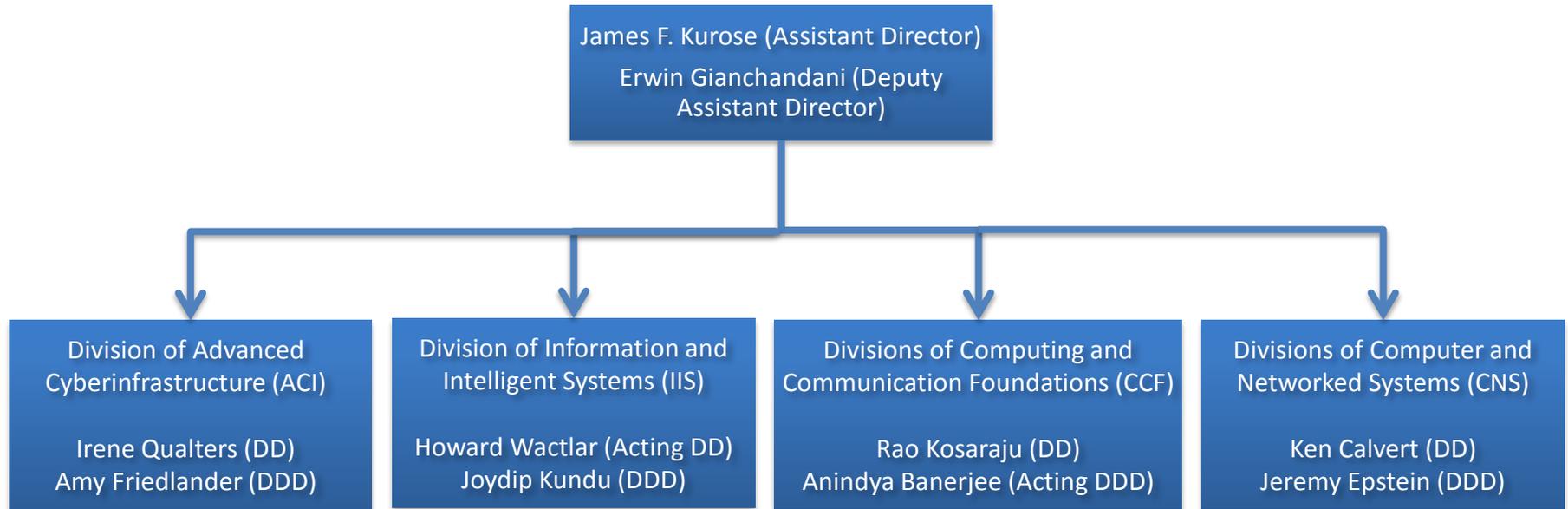
ysolihin@nsf.gov



- Rotating program director (IPA)
- Professor of ECE at NC State University
- Computer Systems Research (CSR)
- Secure and Trustworth Cyberspace (SaTC)
- Scalable Parallelism in the eXtreme (SPX)
 - BigData
 - Major Research Instrumentation (MRI)
 - Cyber Physical System (CPS)
 - Computing Research Infrastructure (CRI)



Computer & Information Science & Engineering (CISE)



Computer & Information Science & Engineering (CISE)



PRIORITIES

- Core research programs across computer science (CS)
- Cross-directorate and cross-NSF programs (e.g., BRAIN, Cyberlearning, Secure and Trustworthy Cyberspace, Cyber-Physical Systems, Software Infrastructure for Sustained Innovation, BIG DATA, Smart and Connected Health/Communities)
- CS education – STEM+C
- Building cyber infrastructure for science and engineering



NSF Directorates and Offices Education & Human Resources (EHR)



Education & Human Resources (EHR)

Kevin M. Lee

Program Director, Division of Undergraduate Education (DUE)

kelee@nsf.gov



IUSE:EHR (Improving Undergraduate STEM Education: Education and Human Resources Program)

-- Physics Discipline Lead

S-STEM (NSF Scholarships in Science, Technology, Engineering, and Mathematics Program)

-- Co-Lead

CFLT (Cyberlearning and Future Learning Technologies Program)

-- Working Group Member

On rotation from the **University of Nebraska – Lincoln, Department of Physics & Astronomy and Center for Science, Mathematics, & Computer Education**



Education & Human Resources (EHR)

William (Jim) Lewis, Assistant Director (Acting)

**Division of Graduate Education
(DGE)**

**Division of Human Resource Development
(HRD)**

**Division of Research on Learning in Formal and
Informal Settings (DRL)**

**Division of Undergraduate Education
(DUE)**



Education & Human Resources (EHR)



STEM Learning and Learning Environments

Cognitive and “non-cognitive” foundations of STEM

Creative uses of formal and informal STEM learning



Broadening Participation and Institutional Capacity Building in STEM

Access to and success in high-quality STEM education for underrepresented groups



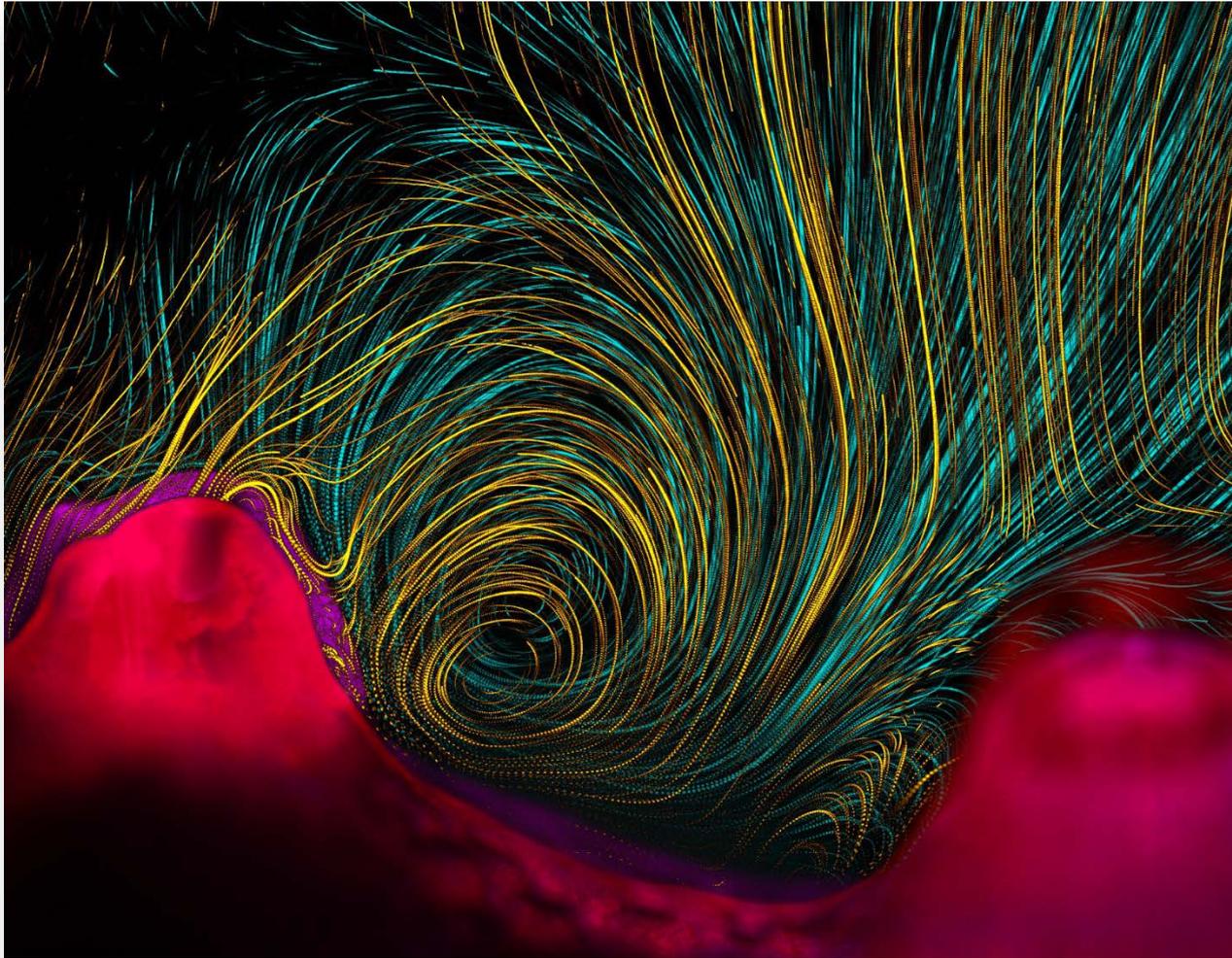
STEM Professional Workforce Development

Capitalize on scientific advances

Address not yet imagined global, social & econ challenges



Engineering (ENG)



Engineering (ENG)

T. J. (Lakis) Mountziaris

Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET)
tmountzi@nsf.gov



Program Director, Division of Chemical,
Bioengineering, Environmental and Transport
Systems (CBET)

Process Systems, Reaction Engineering,
and Molecular Thermodynamics

Professor of Chemical Engineering
University of Massachusetts-Amherst



NSF Directorate for Engineering

**Emerging Frontiers and
Multidisciplinary Activities
(EFMA)**

Sohi Rastegar

**Assistant Director (Acting)
Barry Johnson**

**Deputy Assistant Director
(Acting)
Clifford Gabriel**

**Program Director for
Evaluation and Assessment**
Alexandra Medina-Borja

**Senior Advisor for
Science and Engineering**
Mihail Roco

Operations Officer
Judy Hayden

**Engineering
Education and
Centers
(EEC)**

Division Director
(Acting)
Don Millard

**Chemical,
Bioengineering,
Environmental,
and Transport
Systems
(CBET)**

Division Director
JoAnn Lighty

**Civil,
Mechanical, and
Manufacturing
Innovation
(CMMI)**

Division Director
Deborah Goodings

**Electrical,
Communications,
and Cyber
Systems
(ECCS)**

Division Director
Filbert Bartoli

**Industrial
Innovation and
Partnerships
(IIP)**

Division Director
(Acting)
Graciela Narcho



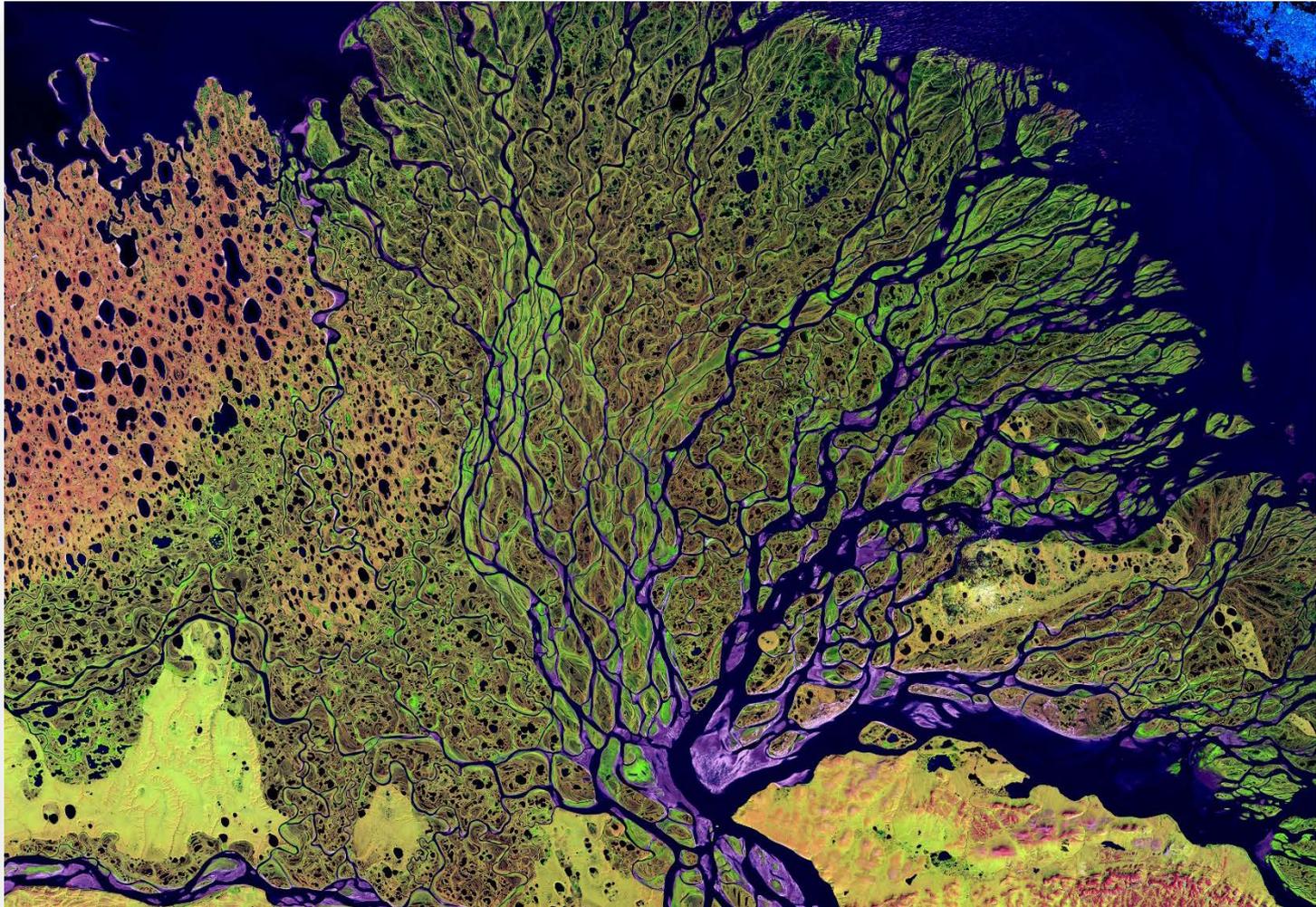
ENG Initiatives and Priorities

Address National Interests

- **INFEWS**
- **Risk and Resilience – Resilient Infrastructure Systems**
 - Urban Science
 - Smart and Connected Communities
- **Clean Energy Technology**
- **Cyber-Enabled Materials, Manufacturing, and Smart Systems**
 - Advanced Manufacturing
- **NNI**
- **ERCs**
- **Communications & Cyberinfrastructure**
- **Education and Broadening Participation**
 - NSF INCLUDES
 - IUUSE: RED
- **Understanding the Brain**
- **Optics and Photonics**
- **ICORPS**
- **GOALI**
- **IUCRC**
- **PFI**
- **SBIR/STTR**



Geosciences (GEO)



Directorate for Geosciences (GEO)

Enriqueta Barrera

Division of Earth Sciences (EAR)

ebarrera@nsf.gov



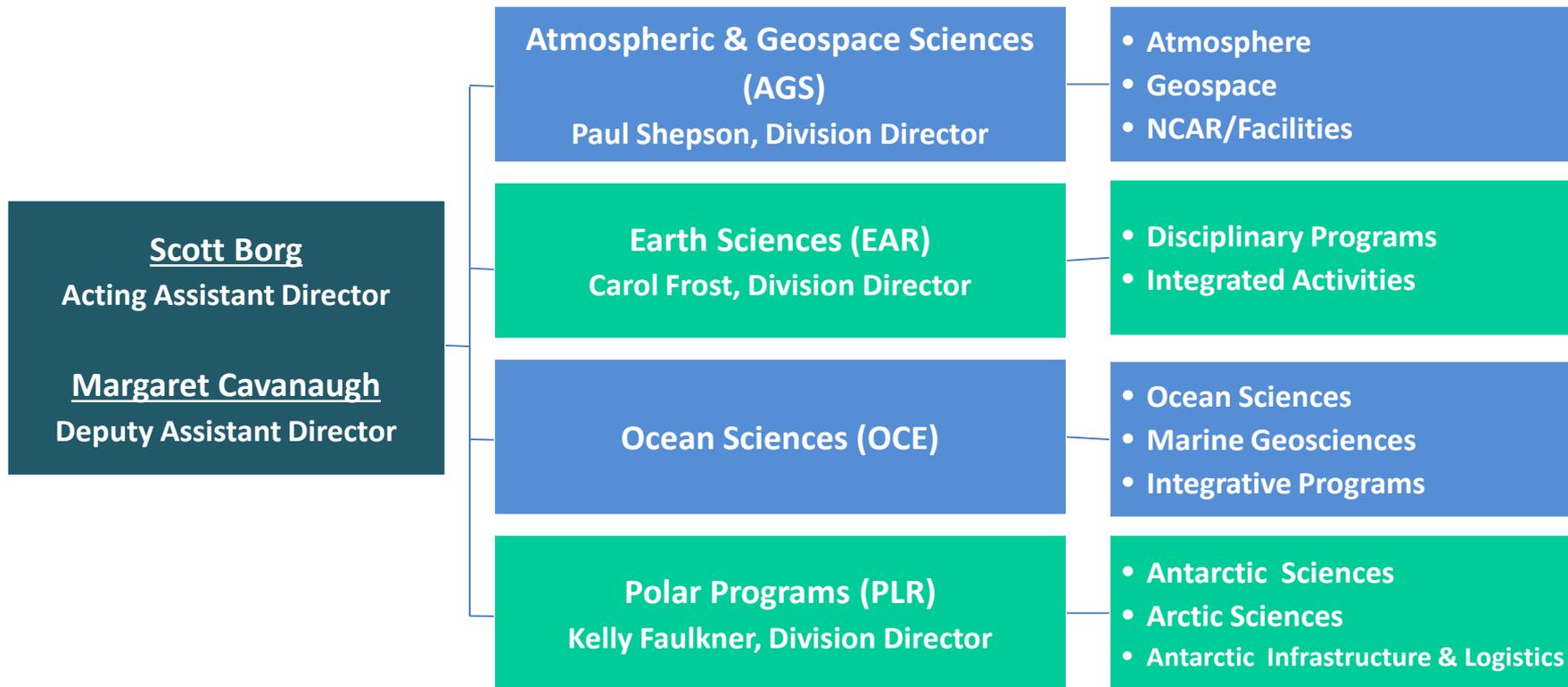
Program Director for Geobiology and Low-Temperature Geochemistry Program

Lead for Sustainable Chemistry, Engineering and Materials (SusChEM) initiative in EAR; Division lead for Research Coordination Networks (RCN)

Joined NSF in 2001; formerly at the University of Akron



Directorate for Geosciences (GEO)



Directorate for Geosciences (GEO)

PRIORITIES

- Support basic research in the Earth, ocean, and atmospheric sciences, from pole to equator, core to space
- Support research facilities and infrastructure (instrument pools, research vessels, NCAR, Antarctic base, and more)
- Promote education and diversity in the geosciences
- PREEVENTS: Prediction of and Resilience against Extreme EVENTS
- INFEWS: Innovations at the Nexus of Food, Energy and Water Systems

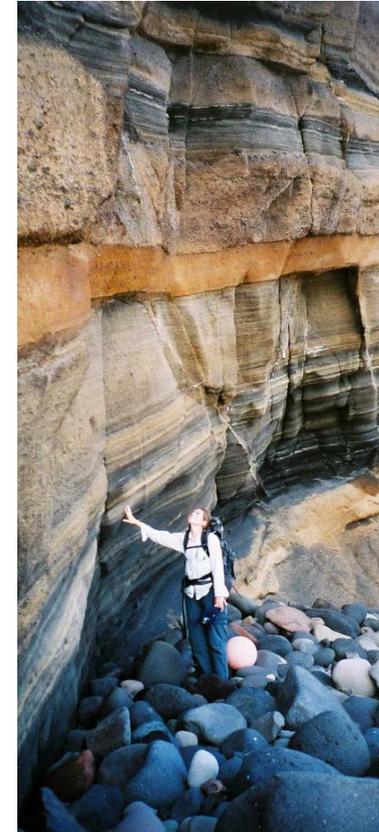
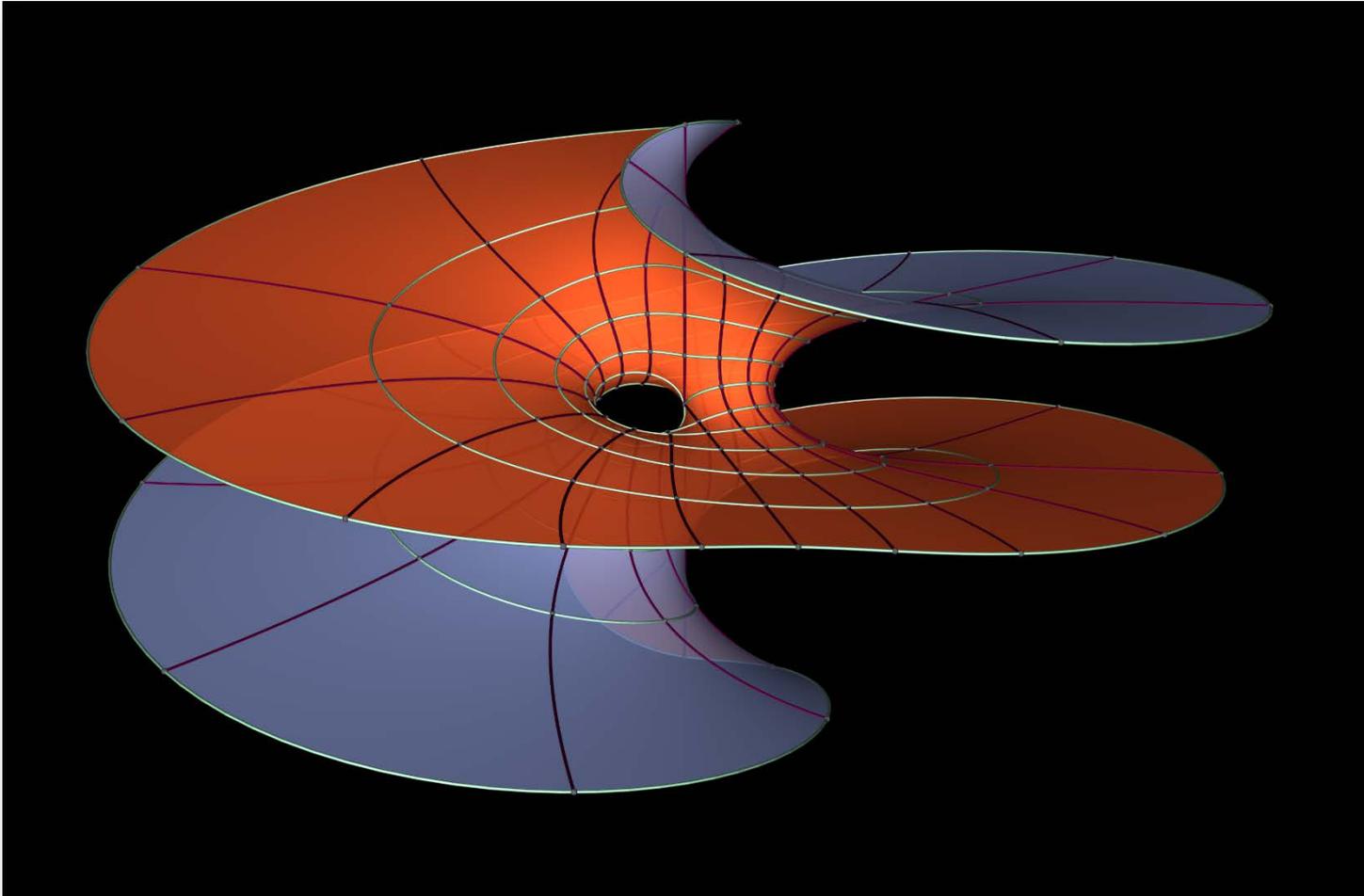


Photo credits: 1) Ben Edwards 2,4,5) Jennifer Wade 3) WiscSIMS



Mathematical & Physical Sciences (MPS)



Mathematical & Physical Sciences (MPS)

Michelle Bushey

Division of Chemistry (CHE)

mbushey@nsf.gov



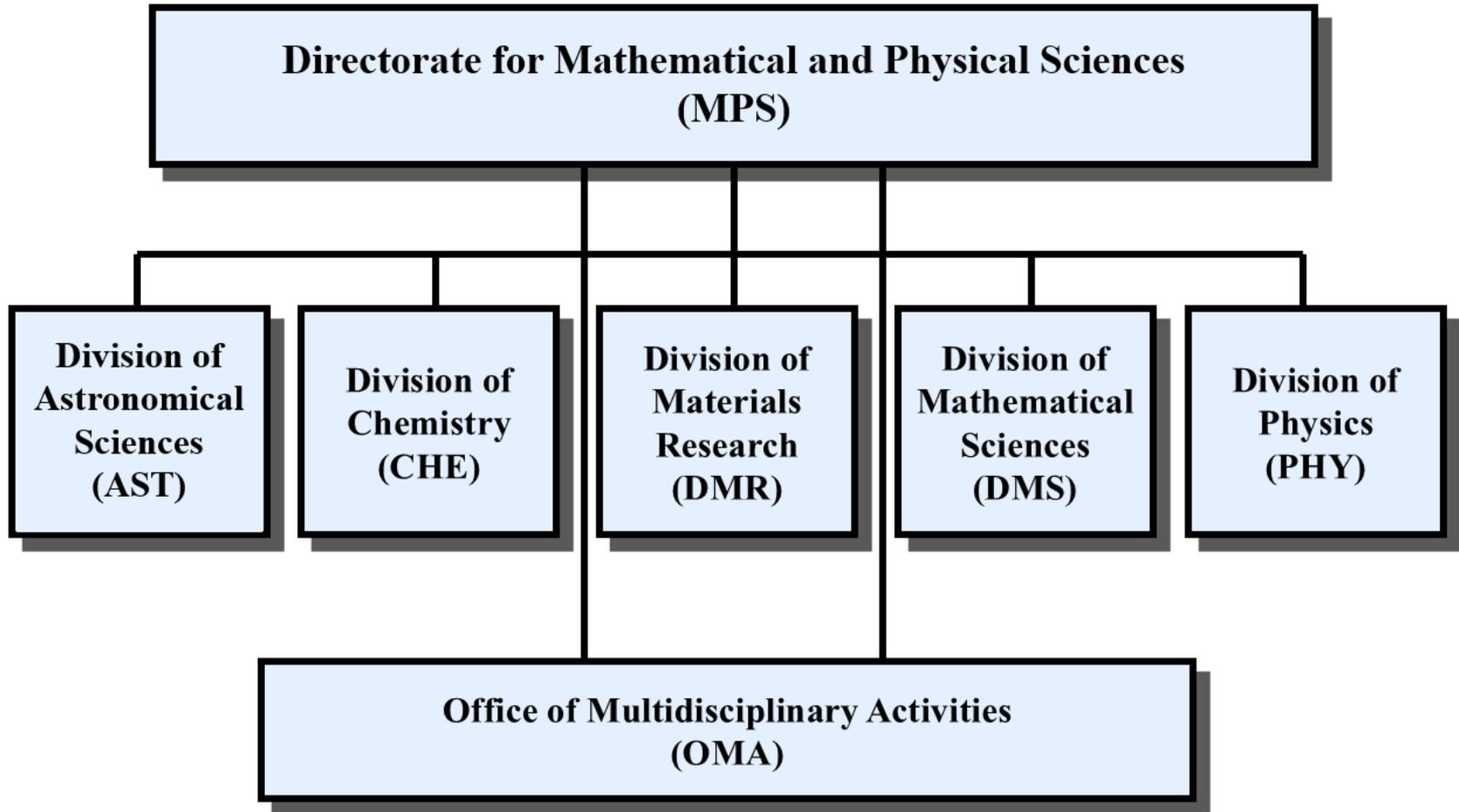
2 years at NSF

- Program Director:
Chemical Measurement and Imaging
Research Experiences for Undergraduates
Special Projects
- Participated in NSF outreach activities especially those directed to PUIs. MSP RUI point of contact. Managed GRFP and PAEMST Panels

Previously, 25 years at Trinity University in San Antonio, TX, Department of Chemistry



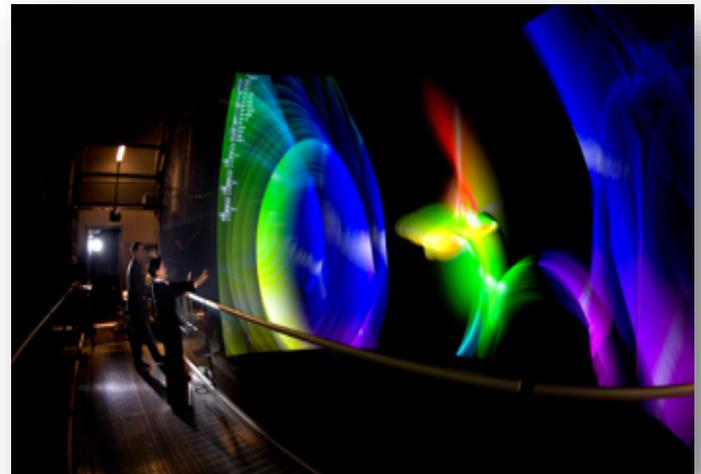
Mathematical & Physical Sciences (MPS)



Mathematical & Physical Sciences (MPS)

EMPHASIS AREAS

- Physical sciences at the nanoscale
- World-class, shared-use Facilities
- Advances in optics and photonics
- Materials by design
- Physics of the universe
- Broadening participation
- Quantum information science
- Data Driven Science, Big Data
- Complex systems (multi-scale, emergent phenomena)
- Innovations at the Nexus of Food, Energy, and Water Systems



Social, Behavioral, & Economic Science (SBE)



Social, Behavioral, & Economic Science (SBE)

Robert O'Connor (Bob)

Division of Social and Economic Sciences (SES)

roconnor@nsf.gov



Program Officer for Decision, Risk and Management Sciences

Management team member for inter-directorate competitions

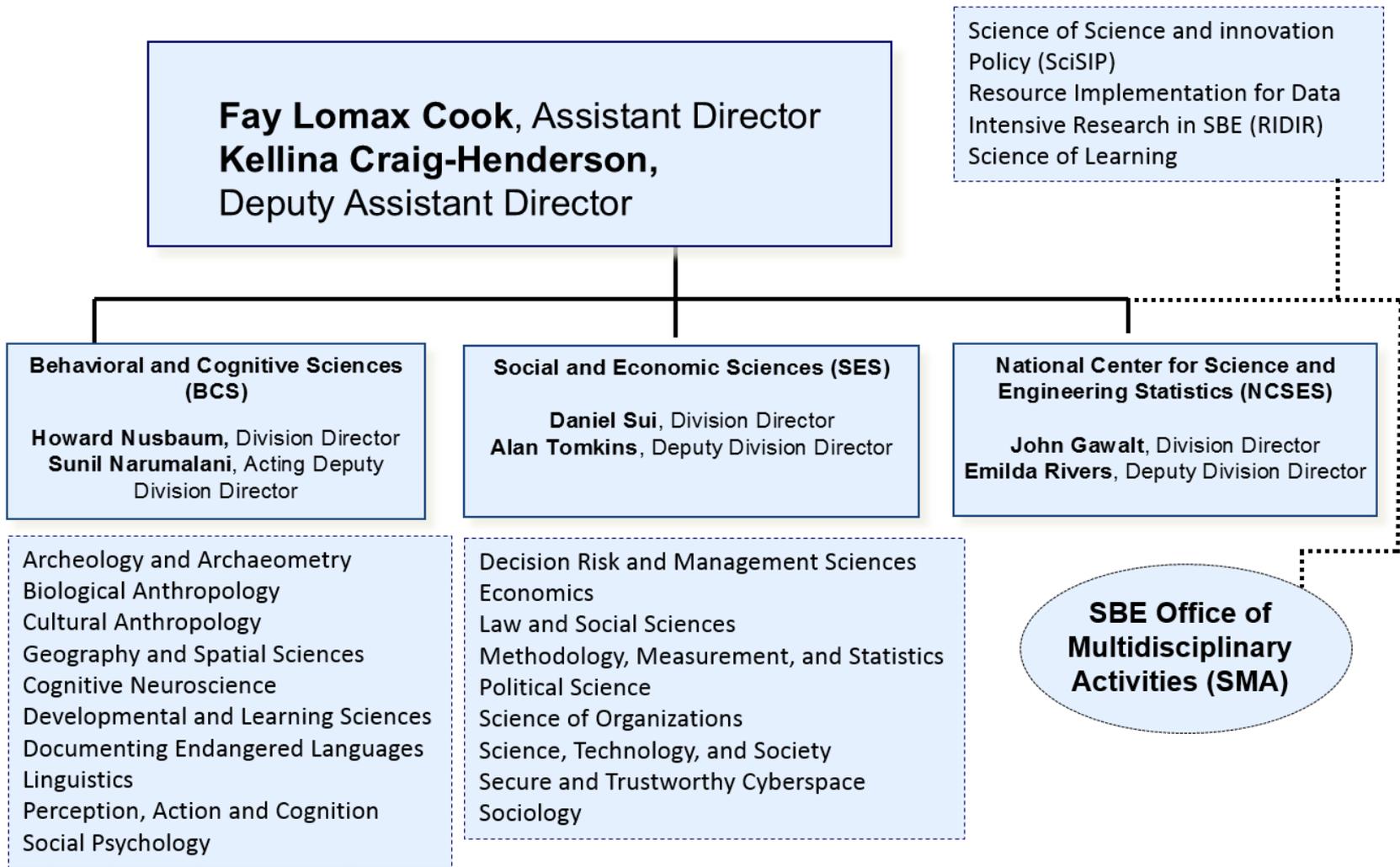
CRISP

INFEWS

PhD: University of North Carolina



Social, Behavioral, & Economic Science (SBE)



Social, Behavioral, & Economic Science (SBE)

Supports research on humans and their institutions across:

Scales (neurons to global organizations and the world)

Times (ancient civilizations to futuristic projections)

Spaces (small towns in America to cities on other continents)

Funds research through:

Award made by individual programs

Participation in inter-directorate
competitions

Supports scientific research:

Quantitative analyses

Qualitative work

Mixed methods studies



Office of International Science & Engineering



Office of International Science & Engineering

Joe Miller

Office of International Science & Engineering

jtmiller@nsf.gov



NSF Program Director since 2013

Spent three years in BIO

Manages SE Asia and Oceania portfolios

Helps BIO directorate with international activities

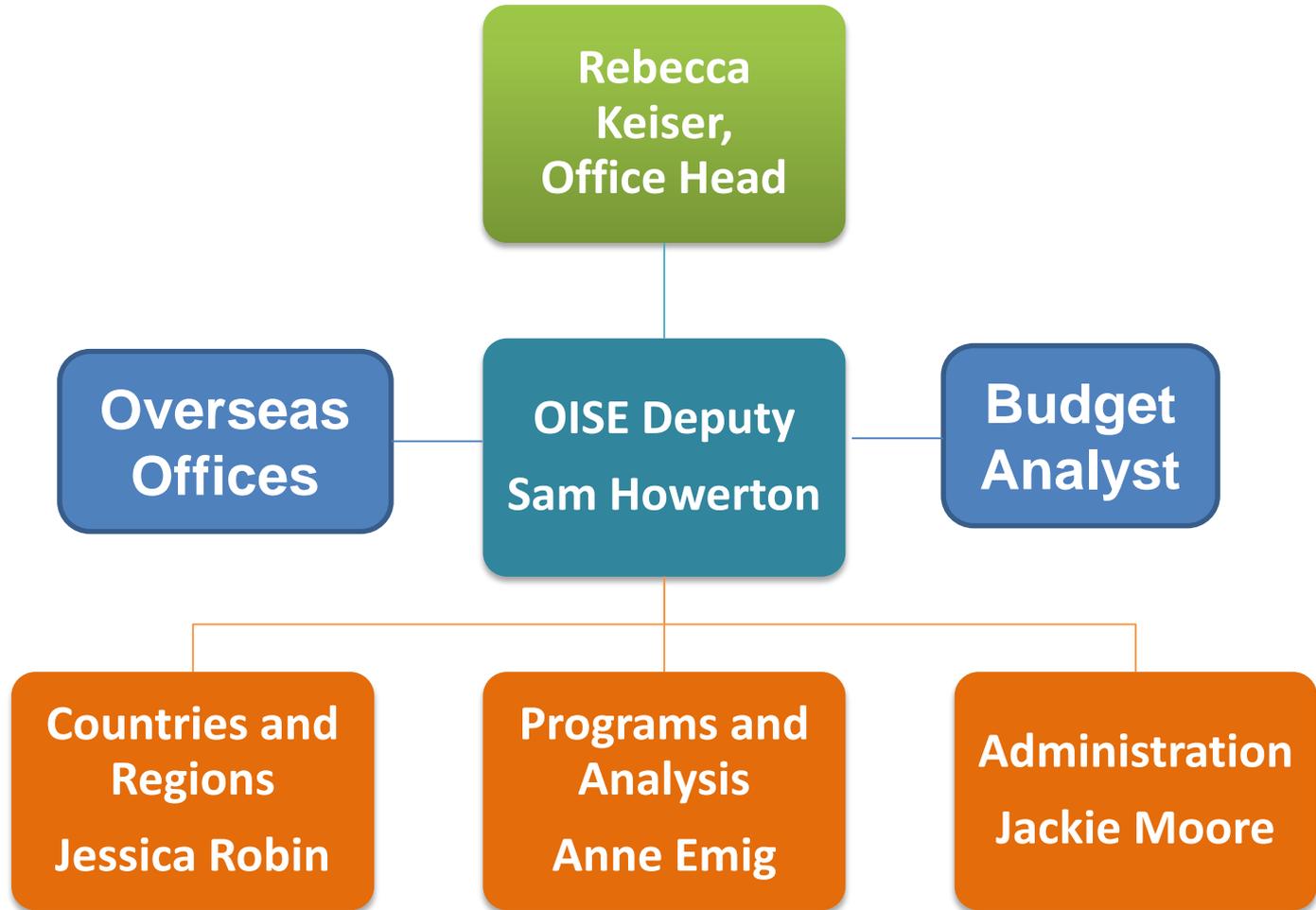
Career:

Plant systematist and biogeographer

Worked most of my career in Australia



Office of International Science and Engineering

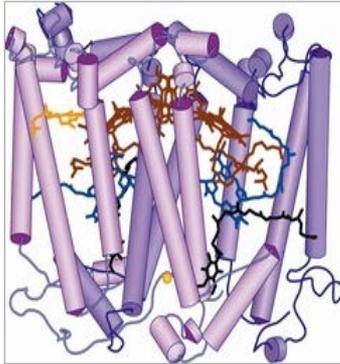


Office of International Science & Engineering



PRIORITIES

Advance the FRONTIERS of S&E via international collaboration



Prepare a GLOBALLY-ENGAGED U.S. S&E workforce

Develop GLOBAL KNOWLEDGE NETWORKS that link U.S. faculty and students to the world



Leverage RESOURCES, EXPERTISE, FACILITIES around the globe



Getting Started The Essentials



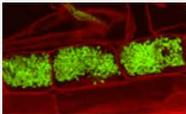


Advancing the Sciences

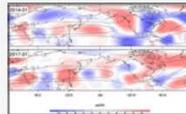
Funding & Supporting

Inspiring & Educating

- HIDE



Feeding fat to fungi: Evidence for lipid transfer in arbuscular mycorrhiza
April 6, 2017



Scientists link California droughts and floods to distinctive atmospheric waves
April 6, 2017



Harms of nighttime light exposure passed to offspring
March 31, 2017

FOLLOW

FOLLOW US



See all NSF social media

View post on Twitter

 National Science Fdn @NSF

NSF Funding & Research Community

SPECIAL NOTICES



Navigating: Funding at www.NSF.gov

The image is a screenshot of the National Science Foundation (NSF) website. At the top left is the NSF logo with the tagline "National Science Foundation WHERE DISCOVERIES BEGIN". To the right is a search bar and "Contact | Help" links. Below the header is a navigation bar with tabs for "NSB", "Research Areas", "Funding", "Awards", "Document Library", "News", and "About NSF". The "Funding" tab is selected and highlighted with a red oval. A dropdown menu is open under "Funding", listing various options: "About Funding", "Browse Funding Opportunities A-Z", "Due Dates", "Find Funding", "Merit Review", "Policies and Procedures", "Preparing Proposals", "Recent Opportunities", and "Transformative Research". To the right of the dropdown menu, there are two sections: "RELATED LINKS" with links to "Proposal and Award Policies and Procedures Guide (PAPPG)", "Research.gov", "FastLane", and "FUNDING OPPORTUNITIES FOR" with sub-links for "Graduate Students", "K-12 Educators", "Postdoctoral Fellows", "Undergraduate Students", and "Small Business". Below the navigation bar, there are several featured articles. One article is titled "Feeding fat to fungi: Evidence for lipid transfer in arbuscular mycorrhiza" dated April 6, 2017, with a thumbnail image of green fungi. Another article is titled "Scientists link California droughts and floods to distinctive atmospheric waves" dated April 6, 2017, with a thumbnail image of a map showing atmospheric waves. On the right side, there is a "FUNDED RESEARCH" section with a "FULL STORY" button and a "- HIDE" button.



Navigating: Awards at www.NSF.gov



National Science Foundation
WHERE DISCOVERIES BEGIN

Contact | Help

Search



NSB

Research Areas

Funding

Awards

Document Library

News

About NSF



[About Awards](#)

[Award Statistics \(Budget Internet Info System\)](#)

[Award Conditions](#)

[Managing](#) [No Title]

[Policies and Procedures](#)

[Presidential and Honorary Awards](#)

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RELATED LINKS

[Research.gov](#)

[FastLane](#)

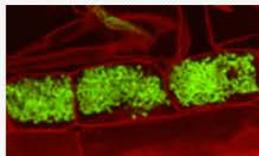
[NSF Public Access Repository \(NSF-PAR\)](#)

Advancing the Sciences

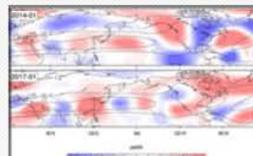
Funding & Supporting

Inspiring & Educating

- HIDE



Feeding fat to fungi: Evidence for lipid transfer in arbuscular mycorrhiza
April 6, 2017



Scientists link California droughts and floods to distinctive atmospheric waves
April 6, 2017



Navigating: Awards at www.NSF.gov

The screenshot shows the NSF.gov website's Awards Simple Search interface. At the top left is the NSF logo with the tagline "National Science Foundation WHERE DISCOVERIES BEGIN". A search bar with the word "SEARCH" and a magnifying glass icon is circled in red, with a red arrow pointing to it from the right. Below the logo is a navigation menu with links for RESEARCH AREAS, FUNDING, AWARDS, DOCUMENT LIBRARY, NEWS, and ABOUT NSF. Underneath this is a secondary menu with links for Simple Search, Advanced Search, Popular Searches, Download Awards, Send Comments, and Award Search Help. The main content area is titled "Awards Simple Search" and features a link for "Overview of Award Search Features". Below this is a search form with the text "Search award for:" followed by an input field and a "Search" button with a green arrow. A red arrow points from the left towards the search form. Below the input field is a note: "Use double quotes for exact search. For example 'water vapor'." There are two checkboxes: "Active Awards" (checked) and "Expired Awards" (unchecked). At the bottom of the page, there is a "Feedback" button, a "FOLLOW US" link, and a footer containing various policy links, the NSF logo, and contact information: "National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749". A "Text Only Version | View Mobile Site" link is also present.



Navigating www.NSF.gov

HOME FUNDING AWARDS DISCOVERIES NEWS PUBLICATIONS STATISTICS ABOUT NSF FASTLANE

Simple Search | Advanced Search | Popular Searches | Download Awards | Send Comments | Award Search Help

Awards Advanced Search

NEW [See What's New in the New Award Search](#)

Awardee Information

Principal Investigator First Name Organization

Principal Investigator Last Name State
 Include Co-Principal Investigator in name search
Zip Code

Country

Program Information

NSF Organization Element Code
 Any All

Reference Code
 Any All
Program
Program Officer

HINT: The "Program" box searches both program element and program reference names and codes.

Additional Information

Keyword
HINT: The Keyword field searches on the title and abstract only.
 Search Award Title Only

Award Number
From To

Award Amount
Award Instrument

HINT: Data prior to 1976 may be less complete.
 Active Awards Expired Awards

Original Award Date From To

Start Date From To

Expiration Date From To



Additional Information on Resources

Join Directorate
Specific Listserves!

Use Grants.gov's
search feature

HELP | MANAGE SUBSCRIPTIONS | REGISTER | LOGIN

SEARCH: Grant Opportunities ▾ Enter Keyword... **GO**

FIND. APPLY. SUCCEED.™

HOME | LEARN GRANTS ▾ | SEARCH GRANTS | APPLICANTS ▾ | GRANTORS ▾ | SYSTEM-TO-SYSTEM ▾ | FORMS ▾ | OUTREACH ▾ | SUPPORT

Apply for a Grant Online Now

Apply for grants by creating a workspace. This feature enables you and your colleagues to work on the grant application online together.

Apply for a Grant with Workspace »

SEARCH GRANTS | GET STARTED | GRANT POLICIES | GRANT-MAKING AGENCIES | PREVENT SCAMS | COMMUNITY BLOG | TWITTER FEED | YOUTUBE VIDEOS | ONLINE HELP | CONTACT CENTER

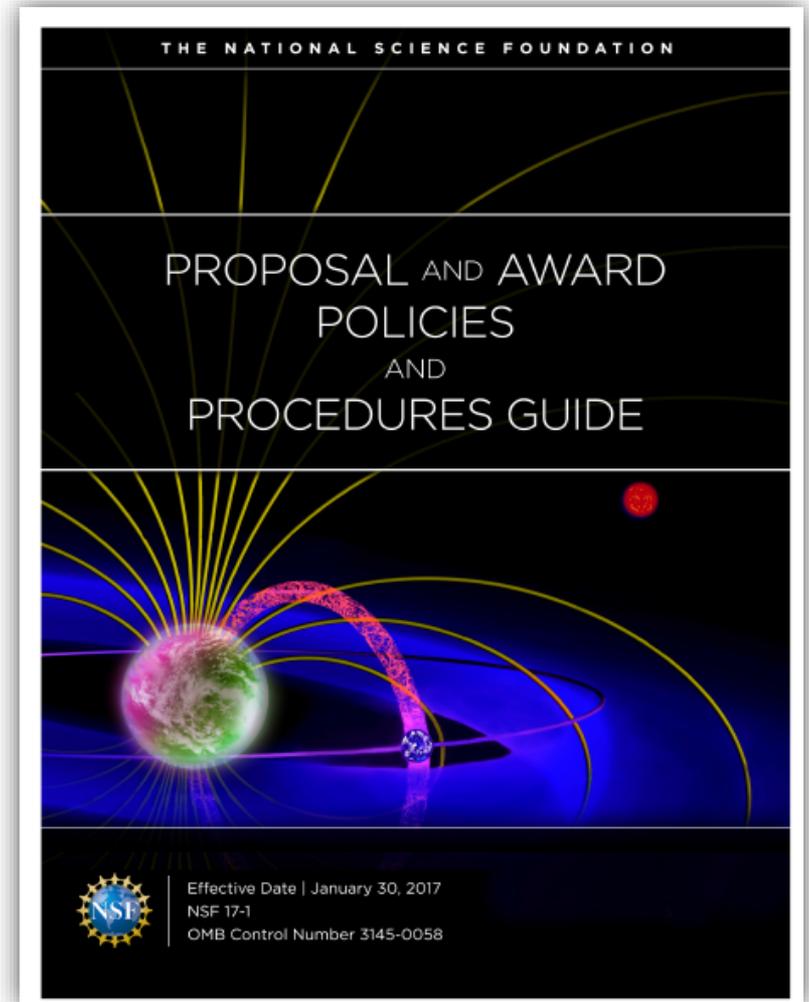


What is the Proposal & Award Policies & Procedures Guide?

The Proposal & Award Policies & Procedures Guide (PAPPG) contains documents relating to NSF's proposal and award process. It has been designed for use by both our customer community and NSF staff and consists of two parts.

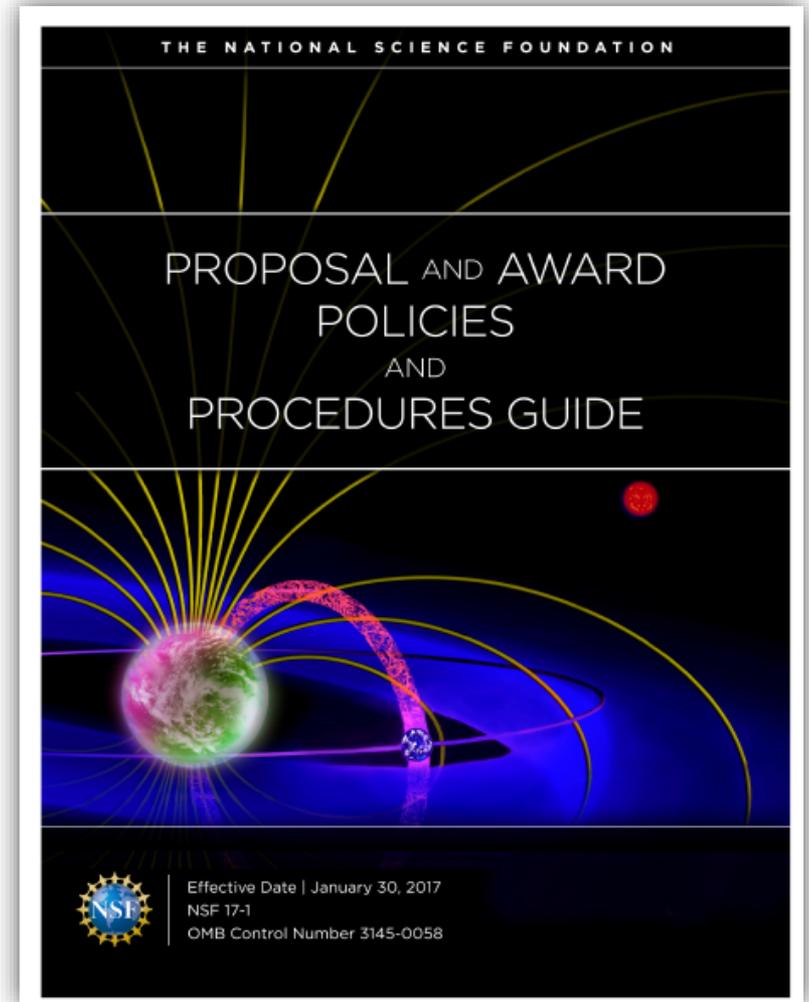
Part I is NSF's proposal preparation and submission guidelines

Part II is NSF's award and administration guidelines



What is the Proposal & Award Policies & Procedures Guide?

- Provides guidance for preparation and submission of proposals to NSF
- Describes process – and criteria – by which proposals will be reviewed
- Outlines reasons why a proposal may not be accepted or returned without review
- Describes process for withdrawals, returns, and declinations
- Includes policies to guide, manage, and monitor the award and administration of grants and cooperative agreements



Types of Funding Opportunities

Program Descriptions

Proposals for a **Program Description** must follow the instructions in the PAPPG.

Program Announcements

Proposals for a **Program Announcement** must follow the instructions in the PAPPG.

Program Solicitations

Proposals must follow the instructions in the **Program Solicitation**; the instructions in the PAPPG apply unless otherwise stated in the solicitation.

Dear Colleague Letters

Dear Colleague Letters are notifications of opportunities or special competitions for supplements to existing NSF awards.



Types of Proposals

- Research
- RAPID
- EAGER
- RAISE
- GOALI
- Ideas Lab
- FASED
- Conference
- Equipment
- Travel
- Facility/Center
- Fellowship



Navigating a Program Description

[Division of Mathematical Sciences](#)

Algebra and Number Theory

CONTACTS

Name	Email	Phone	Room
Tie Luo	tluo@nsf.gov	(703) 292-8448	1025 N
J. Matthew Douglass	mdouglas@nsf.gov	(703) 292-2467	1025 N
Andrew Pollington	adpollin@nsf.gov	(703) 292-4878	1025 N
Victoria Powers	vpowers@nsf.gov	(703) 292-2113	1025 N

PROGRAM GUIDELINES

Apply to PD 10-1264 as follows:

For full proposals submitted via FastLane: standard [Grant Proposal Guide](#) proposal preparation guidelines apply.
For full proposals submitted via Grants.gov: the *NSF Grants.gov Application Guide; A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines* applies. (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

Important Information for Proposers

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 15-1), is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and, implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200). Please be advised that the guidelines contained in NSF 15-1 apply to proposals submitted in response to this funding opportunity.

DUE DATES

Full Proposal Target Date: October 9, 2015
Second Friday of October
Second Friday in October, Annually Thereafter

Research proposals (as opposed to conference proposals) are expected to be submitted by the target date. An extension may be granted under unusual extenuating circumstances, provided that approval is obtained from the cognizant Program Director prior to the target date.

SYNOPSIS

The Algebra and Number Theory program supports research in algebra, algebraic and arithmetic geometry, number theory, and representation theory.

Conferences

Principal Investigators should carefully read the program solicitation "Conferences and Workshops in the Mathematical Sciences" (link below) to obtain important information regarding the substance of proposals for conferences, workshops, summer/winter schools, and similar activities.

For conference proposals with budgets not exceeding \$50,000, which in accordance with NSF policy can be reviewed internally at NSF, the following target dates are in effect: For an event that will take place at some time prior to October 1 during a given year, the proposal should be submitted in October of the previous year. For an event that will occur in the period October 1 through December 31 of a given year, the proposal should be submitted in May of that year. A conference proposal with a budget request exceeding \$50,000 should be submitted roughly seven months before the event is scheduled to take place, in order to allow time for external review.

RELATED PROGRAMS

[Focused Research Groups in the Mathematical Sciences](#)
[Research Training Groups in the Mathematical Sciences](#)
[Faculty Early Career Development Program](#)
[Mathematical Sciences Postdoctoral Research Fellowships](#)
[NSF Graduate Research Fellowship Program](#)

RELATED URLS

[Conferences and Workshops in the Mathematical Sciences](#)

THIS PROGRAM IS PART OF

Disciplinary Research Programs

[What Has Been Funded \(Recent Awards Made Through This Program, with Abstracts\)](#)

[Map of Recent Awards Made Through This Program](#)

[News](#)

Navigating a Program Solicitation

Enhancing Access to the Radio Spectrum (EARS)

PROGRAM SOLICITATION NSF 15-550

REPLACES DOCUMENT(S): NSF 14-529



National Science Foundation

Directorate for Mathematical & Physical Sciences
Division of Astronomical Sciences

Directorate for Engineering
Division of Electrical, Communications and Cyber Systems

Directorate for Computer & Information Science & Engineering
Division of Computer and Network Systems

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

June 02, 2015

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 15-1), which is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Enhancing Access to the Radio Spectrum (EARS)
Opportunities for interdisciplinary research that increases the efficiency of the radio spectrum, expanding the access to wireless-enabled services for all Americans.

Synopsis of Program:

The National Science Foundation's Directorates for Mathematical and Physical Sciences (MPS), Engineering (ENG), and Computer and Information Science and Engineering (CISE) are coordinating efforts to identify bold new concepts with the potential to

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 20 to 25

Each proposal may request up to \$750,000 in total funding over a period of up to three years.

Anticipated Funding Amount: \$15,000,000

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI:

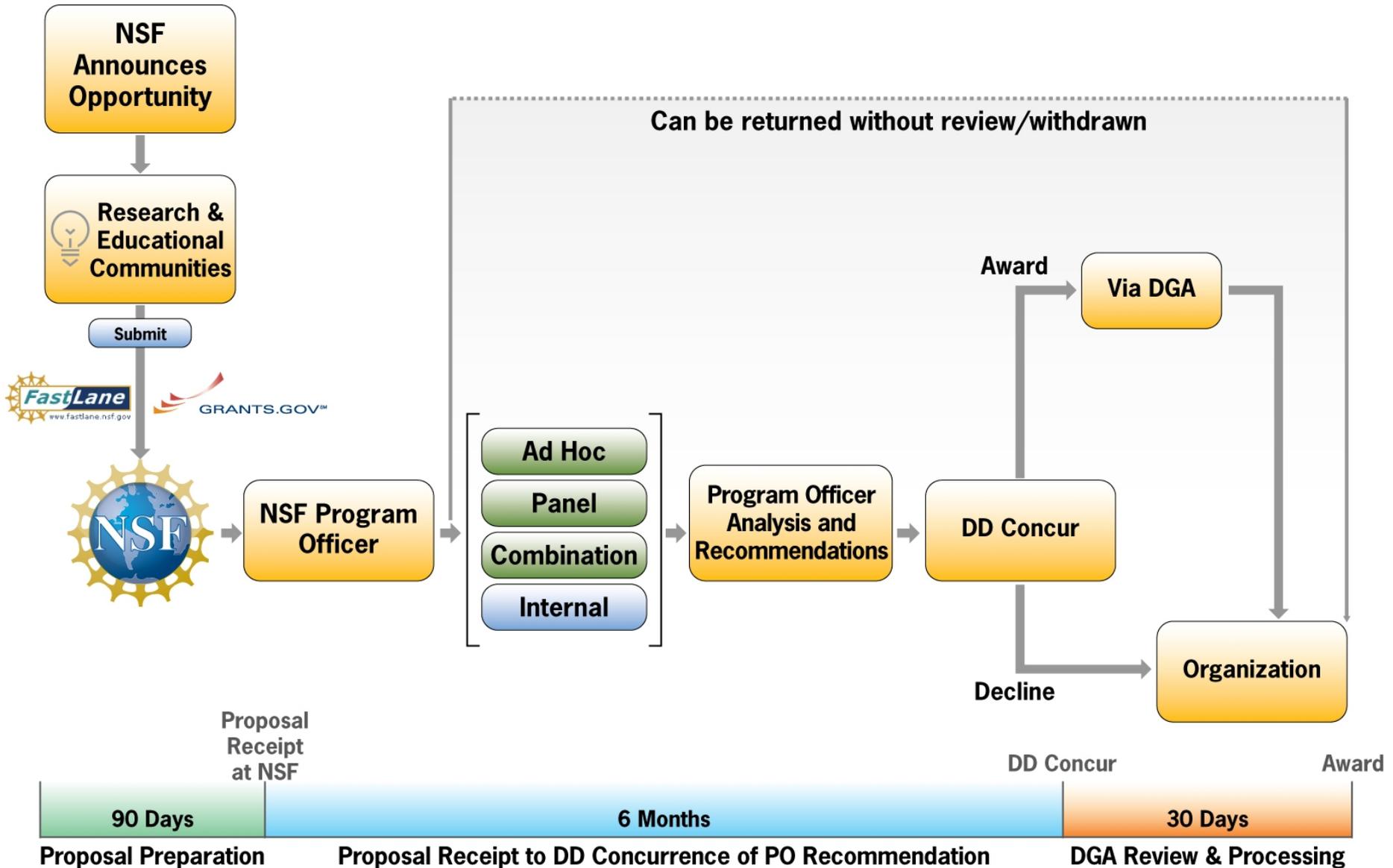
A proposer may be a Principal Investigator (PI) or co-PI on up to two proposals.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete

NSF Proposal & Award Process Timeline



Types of Proposal Submissions



Target Dates –
Talk to the Program Office
if you think you might miss
the date

F. When to Submit Proposals

Proposers should allow adequate time for NSF review and processing of proposals (see [GPG Chapter I.H](#) for further information). Many NSF programs accept proposals at any time. Other programs, however, establish due dates for submission of proposals. The following types of due dates are utilized by NSF:

1. **Target dates:** dates after which proposals will still be accepted, although they may miss a particular panel or committee meeting.
2. **Deadline dates:** dates after which proposals be returned without review by NSF. The deadline date will be waived only in extenuating circumstances. Such a deviation only may be authorized in accordance with [GPG Chapter II.A.](#)



Types of Proposal Submissions



Deadline Dates –
Proposals will not be accepted after this date and time (5 pm submitter's local time)

F. When to Submit Proposals

Proposers should allow adequate time for NSF review and processing of proposals (see [GPG Chapter I.H](#) for further information). Many NSF programs accept proposals at any time. Other programs, however, establish due dates for submission of proposals. The following types of due dates are utilized by NSF:

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Types of Proposal Submissions



Submission Windows –
Closing date converts to a
deadline date

3. Submission windows: designated periods of time during which proposals will be accepted for review by NSF. It is NSF's policy that the end date of a submission window converts to, and is subject to, the same policies as a deadline date.



Types of Proposal Submissions



Letters of Intent –
Enables better management of reviewers and panelists

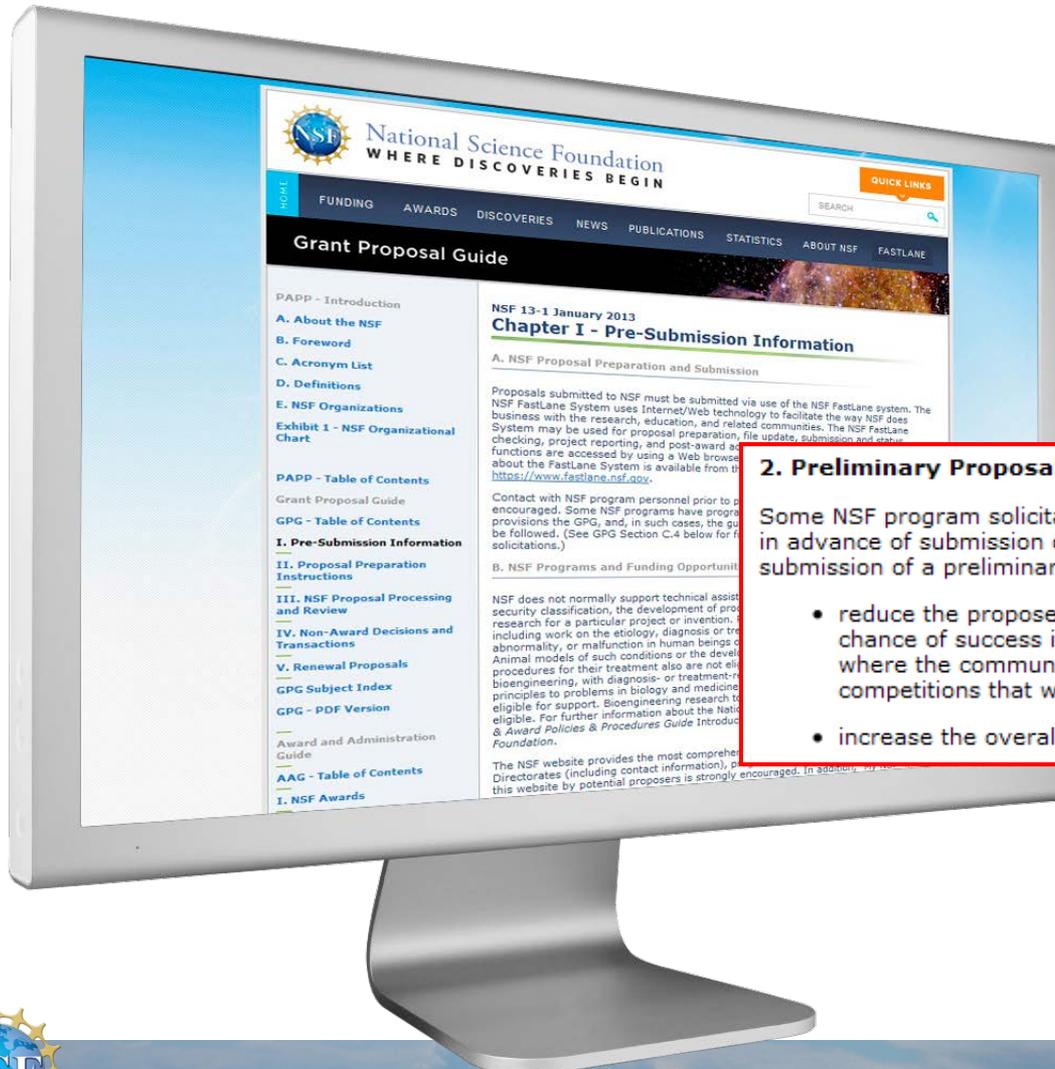
1. Letter of Intent

Some NSF program solicitations require or request submission of a letter of intent (LOI) in advance of submission of a full proposal. A LOI is not binding. The predominant reason for its use is to help NSF program staff to gauge the size and range of the competition, enabling earlier selection and better management of reviewers and panelists. In addition, the information contained in a LOI is used to help avoid potential conflicts of interest in the review process.

A LOI normally contains the PI's and co-PI's names, a proposed title, a list of possible participating organizations (if applicable), and a synopsis that describes the work in sufficient detail to permit an appropriate selection of reviewers. A LOI is not externally evaluated or used to decide on funding. The requirement to submit a LOI will be identified in the program solicitation, and such letters are submitted electronically via the NSF FastLane System.



Types of Proposal Submissions



Preliminary Proposals –
Sometimes required,
sometimes optional

2. Preliminary Proposal

Some NSF program solicitations require or request submission of a preliminary proposal in advance of submission of a full proposal. The two predominant reasons for requiring submission of a preliminary proposal are to:

- reduce the proposers' unnecessary effort in proposal preparation when the chance of success is very small. This is particularly true of exploratory initiatives where the community senses that a major new direction is being identified, or competitions that will result in a small number of actual awards; and
- increase the overall quality of the full submission.

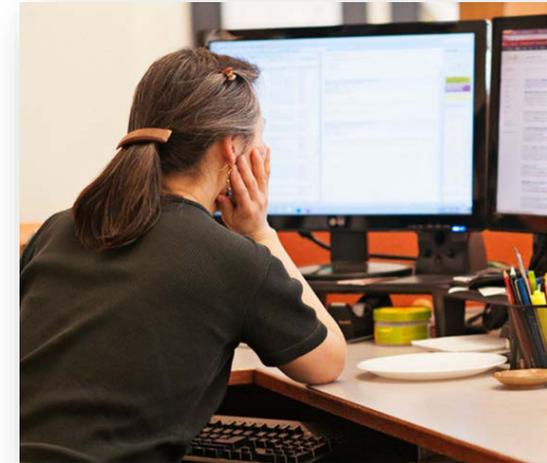


Questions on Funding Opportunities?



Contact your
NSF Program Officer

Work with your organization's
sponsored projects office



Ask Early, Ask Often
policy@nsf.gov



Things to Consider Before Applying...



Five Key Elements



1. Great idea
2. Fit with current research expertise and career development plans
3. Ability to devise a strategy including benchmarks, timelines, and metrics
4. Adequate resources to accomplish your project
5. Assessment Plan

Developing your Proposal

Key Questions for Prospective Investigators

- What has already been done?
- Develop hunch or hypotheses for forward progress
- Obtain preliminary data
- What do you intend to do?
- Why is the work important or unique?



Proposal Development Strategies:

What Do You Need Besides \$???

- Prepare to do the project
 - How are you going to do the work?
 - Realistically assess needs
 - Do you have the right team?
 - Determine available resources
 - Present to colleagues/mentors/students
- Determine possible funding sources
(NSF may not be the right or the only one)



Proposal Development Strategies:

What details should you glean from the solicitation?



- Overall scope and mission
- Instructions (deviations from the PAPPG)
- How your proposed project fits with the solicitation
- Review procedures and criteria
- Deadlines

Proposal Development Strategies:

Who Should You Talk To?

NSF Program Officer

Your proposed project

Clarifications on specific program requirements/limitations

Current program patterns

Your Organization's Sponsored Projects Office

- University guidelines for applications
- Institutional Review Board “IRB” Approvals
 - e.g. institutional Animal Care and Use Committee (IACUC) approvals



**So you want to
write a proposal . . .**



NSF PROPOSAL INGREDIENTS



- Cover Page
- Project Summary (1 page)
- Table of Contents (auto-generated)
- Project Description (15 pages)
- References Cited
- Biographical Sketches (for all senior personnel)
- Budget
- Current and Pending Support
- Facilities, Equipment, and Other Resources
- Post-doctoral mentoring plan (if applicable)
- Data management plan
- Supplementary Documentation (if applicable)



Parts of an NSF Proposal

Cover Sheet

Many of the boxes on the cover sheet are electronically prefilled as part of the FastLane login process.

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE (if not in response to a program announcement/solicitation enter NSF 14-1)					FOR NSF USE ONLY	
NSF 14-1					NSF PROPOSAL NUMBER	
FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (indicate the most specific unit known, i.e. program, division, etc.)					1509402	
PHY - ASTROPHYSICS & COSMOLOGY THEOR						
DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION	
11/03/2014	1	03010000 PHY	1288	084184116521	11/03/2014 8:29pm	
EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)		SHOW PREVIOUS AWARD NO. IF THIS IS <input type="checkbox"/> A RENEWAL <input type="checkbox"/> AN ACCOMPLISHMENT-BASED RENEWAL		IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, LIST ACRONYM(S)		
NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE NSF			ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE Arlington, VA 222000000			
AWARDEE ORGANIZATION CODE (IF KNOWN) 4102852000			US			
NAME OF PRIMARY PLACE OF PERF			ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE			
IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)		<input type="checkbox"/> SMALL BUSINESS	<input type="checkbox"/> MINORITY BUSINESS	<input type="checkbox"/> IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE		
		<input type="checkbox"/> FOR-PROFIT ORGANIZATION	<input type="checkbox"/> WOMAN-OWNED BUSINESS			
TITLE OF PROPOSED PROJECT International Conference Cosmical Magnetic Fields						
REQUESTED AMOUNT \$ 30,000	PROPOSED DURATION (1-60 MONTHS) 0 months	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE			
THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW						
<input type="checkbox"/> BEGINNING INVESTIGATOR (GPG I.G.2)			<input type="checkbox"/> HUMAN SUBJECTS (GPG II.D.7) Human Subjects Assurance Number _____ Exemption Subsection _____ or IRB App. Date _____			
<input type="checkbox"/> DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)			<input type="checkbox"/> INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.i)			
<input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D., II.C.1.d)						
<input type="checkbox"/> HISTORIC PLACES (GPG II.C.2.j)						
<input type="checkbox"/> VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____ PHS Animal Welfare Assurance Number _____			<input checked="" type="checkbox"/> COLLABORATIVE STATUS Not a collaborative proposal			
<input checked="" type="checkbox"/> FUNDING MECHANISM Conference, Symposium, Workshop						
PI/PD DEPARTMENT Physics		PI/PD POSTAL ADDRESS 4201 WILSON BLVD				
PI/PD FAX NUMBER		ARLINGTON, VA 222300000 United States				
NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address		
PI/PD NAME Terry Demo	DSc	1999	703-292-9000	td@nsf.gov		
CO-PI/PD						
CO-PI/PD						
CO-PI/PD						
CO-PI/PD						



Parts of an NSF Proposal

Project Summary Requirements:

Overview

Statement on Intellectual Merit

Statement of Broader Impacts

Special characters (e.g., formulas) may be uploaded as a PDF

Project Description Addresses:

What you want to do

Why you want to do it

How you plan to do it

How you measure success

What are the benefits

Results from prior NSF support



Parts of an NSF Proposal

A separate section,
Broader Impacts of the Proposal Work,
must be completed



Budgetary Guidelines

Amounts should be:

- **Realistic and reasonable**
- **Well-justified and should establish need**
- **Consistent w/program guidelines in solicitation and Proposal & Award Policies & Procedures Guide (PAPPG)**

Eligible costs consist of:

- **Personnel**
- **Equipment**
- **Travel**
- **Participant support**
- **Other** (e.g., subawards, consultant and computer services, publications costs)
- **Indirect costs** (as appropriate)



NSF Cost Sharing Policy

Inclusion of *voluntary committed* cost sharing is prohibited in the budget of solicited & unsolicited proposals.

Organizations may, at their own discretion, continue to contribute *voluntary uncommitted* cost sharing to NSF-sponsored projects as part of the section for Facilities, Equipment, and Other Resources.



Sections of an NSF Proposal

Facilities, Equipment, and Other Resources

Used to assess the adequacy of the organizational resources available to perform the effort proposed. Should not contain quantifiable financial information.

Current and Pending Support

This section of the proposal requires reporting on all current and pending support for ongoing projects and proposals from any funding source.



Special Information and Supplementary Documentation

Letters of collaboration (no letters of support)

Postdoctoral mentoring plans

Data management plans

You should alert NSF officials to unusual circumstances that require special handling (i.e. proprietary information)

Solicitations may specify what is and is not allowed to be submitted



Mentoring for Postdoctoral Researchers

- Explicit description of the mentoring activities
- Must include a mentoring plan as a supplementary document (maximum one-page)
- For collaborative proposals, lead organization must submit a single mentoring plan for all postdoctoral researchers supported under the entire project.



Data Management Plan Requirements

Requirements by Directorate, Office, Division, Program, or other NSF Unit

Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units, are provided below. If guidance specific to the program is not provided, then the requirements established in the PAPPG Chapter II.C. 2. J. apply

Please note that if a specific program solicitation provides guidance on preparation of data management plans, such guidance must be followed.

- Engineering Directorate (ENG)
 - [Directorate-wide Guidance](#)
- Geological Sciences Directorate (GEO)
 - [Division of Earth Sciences](#)
 - [Integrated Ocean Drilling Program](#)
 - [Division of Ocean Sciences](#)
- Mathematical and Physical Sciences Directorate (MPS)
 - [Division of Astronomical Sciences](#)
 - [Division of Chemistry](#)
 - [Division of Materials Research](#)
 - [Division of Mathematical Sciences](#)
 - [Division of Physics](#)
- Social, Behavioral and Economic Sciences Directorate (SBE)
 - [Directorate-wide Guidance](#)

[Data Management & Sharing Frequently Asked Questions \(FAQs\)](#)

**Requirements
may vary by
Directorate or
Office**

nsf.gov/bfa/dias/policy/dmp.jsp



Questions?



The Merit Review Process



NSF's Proposal & Award Process Timeline

Black Box?



Merit Review Criteria

Intellectual Merit:

the potential to advance knowledge

Broader Impacts:

the potential to benefit society and contribute to the achievement of specific, desired societal outcomes



When Preparing Proposals

- Read the funding opportunity; ask a Program Officer for clarifications if needed
- Address all the proposal review criteria
- Understand the NSF merit review process
- Avoid omissions and mistakes
- Check your proposal to verify that it is complete!
- Double Check that the proposal NSF receives is the one you intended to send



Merit Review Guiding Principles & Criteria

The Proposal & Award Policies & Procedures Guide (PAPPG) contains a description of the Merit Review Criteria



A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.



Review Format in FastLane

- Reviewers provide feedback to NSF based on the Review Criteria and the Review Elements
- Review Criteria and Elements are available as reviewers provide feedback

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

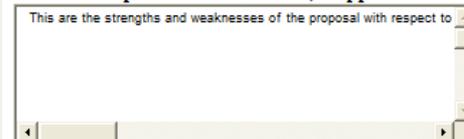
In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

A large, empty rectangular text box with a light beige background and a thin border. It has a scroll bar on the right side, indicating it is a multi-line text area.

In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

A large, empty rectangular text box with a light beige background and a thin border. It has a scroll bar on the right side, indicating it is a multi-line text area.

Please evaluate the strengths and weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if applicable.

A large, empty rectangular text box with a light beige background and a thin border. It has a scroll bar on the right side, indicating it is a multi-line text area.

Over 2,000 proposals were RWR in FY 2014

6 most common reasons why

1. Not responsive to the GPG or program announcement/solicitation (960)
2. Does not meet an announced proposal deadline date and time (171)
3. It is inappropriate for NSF funding (74)
4. Duplicative or substantially similar to a proposal already under consideration (66)
5. Not substantively revised from a proposal that was previously reviewed and declined (37)
6. Duplicates another proposal that was already awarded (24)



Types of Reviews

- Ad Hoc
 - Proposals are sent out for review
- Panel
 - Face-to-Face sessions conducted with reviewers. Held at NSF, or virtually via assistive technologies such as WebEx or BlueJeans
- Combination
 - Some proposals may undergo supplemental ad hoc reviews before or after a panel review
- Internal
 - Reviewed by NSF Program Officers



How are Reviewers Selected?

- **Three or more external reviewers per proposal are selected**
- **Types of Reviewers Recruited**
 - Specific content expertise
 - General science or education expertise
- **Sources of Reviewers**
 - Former reviewers
 - Program Officer's knowledge of the research area
 - References listed in proposal
 - Recent professional society programs
 - S&E journal articles related to the proposal
 - Reviewer recommendations included in proposal



What is the Role of the Reviewer?

- **Review all proposal material and consider**
 - The two NSF merit review criteria and any program specific criteria
 - Adequacy of the proposed project plan- including the budget, resources, and timeline
 - Priorities of the scientific field and of the NSF program
 - Potential risks and benefits of the project
- **Make independent written comments on the quality of the proposal content and assign a rating: E,V,G,F,P**



What is the Role of the Review Panel?

- Discuss the merits of the proposal with the other panelists
- Write a summary based on that discussion
- Provide some indication of the relative merits of different proposals considered



Why Serve on an NSF Panel?

- Gain first-hand knowledge of the merit review process
- Learn about common problems with proposals
- Discover proposal writing strategies
- Meet colleagues and NSF Program Officers managing the programs related to your research



How Do I Become a Reviewer?

Contact the NSF Program Officer(s) of the program(s) that fit your expertise

- Introduce yourself as a strong potential reviewer based on your research experience
- Offer to send a 2-page CV with current contact information
- Stay in touch if you don't hear back right away



Conflicts of Interest (COI)



What is a COI?

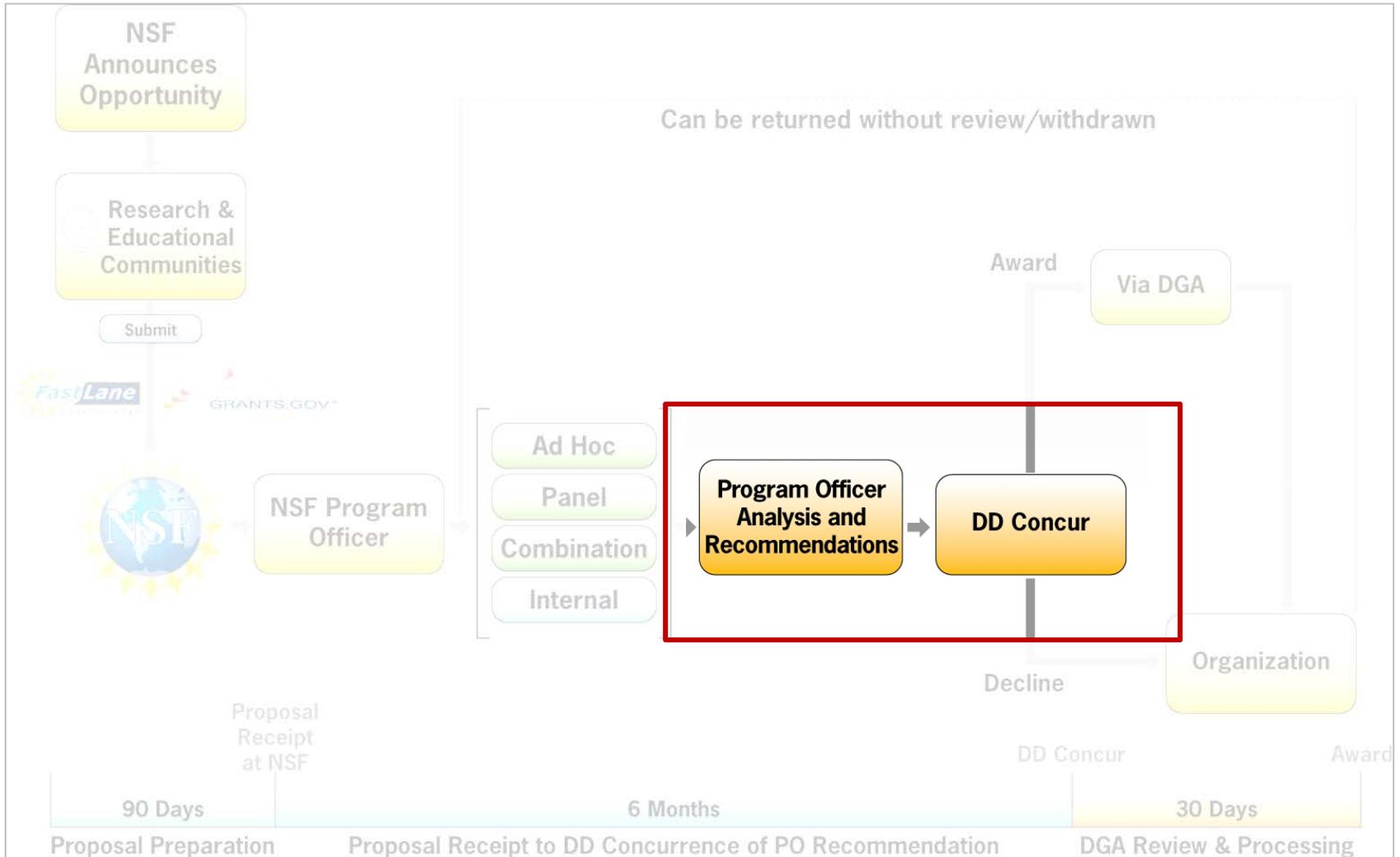
How we address conflict of interest

NSF checks and avoids COIs in the review process

Institutional COIs

Personal COIs

Proposal Review and Processing



Funding Decisions

Reviews are Advisory to NSF

- **The merit review process provides:**
 - Review of the proposal and a recommendation on funding.
 - Feedback (strengths and weaknesses) to the proposers.
- **NSF Program Officers make funding recommendations guided by program goals and portfolio considerations.**
- **NSF Division Directors either concur or reject the Program Officers' funding recommendations.**



Feedback from Merit Review

- Reviewer ratings (such as: E, V, G, F, P)
- Analysis of how well proposal addresses both review criteria: Intellectual Merit and Broader Impacts
- Proposal strengths and weaknesses
- Reasons for decline (if applicable)
- If you have any questions, contact cognizant Program Officer.



Examples of Reasons for Declines

- Not considered competitive based on merit review criteria and program office concurrence
- Flaws or issues identified by the Program Officer
- Funds were not adequate to fund all competitive proposals



Revisions and Resubmissions

- Do the reviewers and the NSF Program Officer identify significant strengths in your proposal?
- Can you address the identified weaknesses?
- Can the proposal be **significantly** revised?
- Are there other ways your colleagues or you think a resubmission can be strengthened?



Questions?

Contact your cognizant Program Officer!

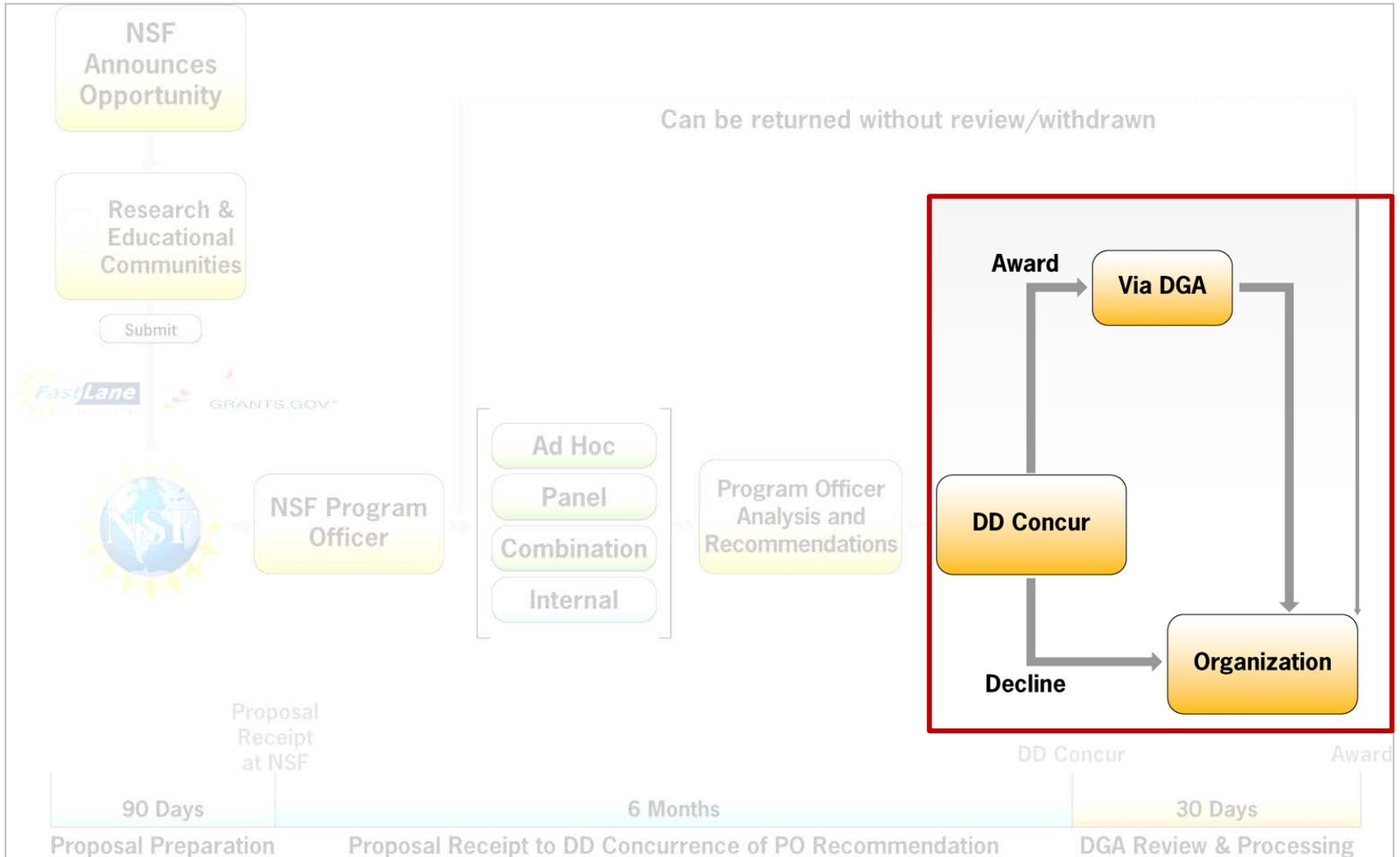


Possible Considerations for Funding a Competitive Proposal

- Addresses all review criteria
- Likely high impact
- Broadening participation
- Educational impact
- Impact on institution/state
- Special programmatic considerations (e.g. CAREER/RUI/EPSCoR)
- Other support for PI
- “Launching” versus “Maintaining”
- Portfolio balance



Proposal Review and Processing



For More Information

Go to NSF's Home Page (www.nsf.gov)

Merit Review

NOTICE: Effective January 14, 2013, the National Science Foundation implemented revised merit review criteria based on the National Science Board (NSB) report, National Science Foundation's Merit Review Criteria: Review and Revisions. While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Revisions based on the NSB report have been incorporated into the Foundation's policies and procedures manuals, websites, and systems. Proposers should familiarize themselves with the Merit Review Principles and Criteria described in [GPG Chapter III.A](#). For comprehensive outreach and training materials visit the [Revised Merit Review Criteria Resource site](#).

Through its merit review process, the National Science Foundation (NSF) ensures that proposals submitted are reviewed in a fair, competitive, transparent, and in-depth manner. The merit review process is described in detail in Part I of the NSF [Proposal & Award Policies & Procedures Guide \(PAPPG\)](#); the [Grant Proposal Guide \(GPG\)](#). The GPG provides guidance for the preparation and submission of proposals to NSF.

The goal of this Merit Review website is to help you better understand the NSF merit review process as well as identify resources for additional information (including applicable chapters in the GPG). Sections of this website include:

- [Phase I: Proposal Preparation and Submission](#)
- [Phase II: Proposal Review and Processing](#)
- [Phase III: Award Processing](#)
- [Non-Award Decisions and Transactions](#)
- [Merit Review Facts](#)
- [Why You Should Volunteer to Serve As An NSF Reviewer](#)
- [Merit Review FAQs](#)
- [Additional Resources](#)
- [Contact Us](#)



Ask Early, Ask Often!

Contact the cognizant Program Officer



Questions?



Faculty Early Career Development Program “CAREER”



www.nsf.gov/career

CAREER Awards



New Solicitation – 17-537

Cross-disciplinary perspectives

Due Dates: Next Deadlines:

- July 19, 2017 – BIO, CISE, EHR
- July 20, 2017 – ENG
- July 21, 2017 – GEO, MPS, SBE

Future Years - Third Wed, Thursday, Friday of July

www.nsf.gov/career



CAREER Awards

Foundation wide

Supports junior faculty



Research and education integration

PECASE (Presidential Early Career Award for Scientists and Engineers) eligibility



CAREER Awards



Stable support for 5 years

NSF wide: 500+/year

> \$400K

An eligible institution must be:

An academic institution in the U.S., its territories or possessions, and the Commonwealth of Puerto Rico that award degrees in fields supported by NSF.



An eligible institution may also be:

Non-profit, non-degree-granting (e.g. a museum, observatory or lab) if the eligibility requirements of the PI are satisfied.

NSF encourages proposals from different institutional types, including minority serving and undergraduate institutions



CAREER varies across NSF

- Number of submitted CAREER proposals
- Review and Funding methods
- Other Proposals with which CAREERs compete



NSF CAREER Coordinating Committee
Sets NSF-wide goals

CAREER Proposals

Contact program manager liaison* and ask about:

- Expectations for scope of research and education
- Assessment of 2-page departmental letter
- Funding rate trend for regular proposals in the program of interest

* see <http://www.nsf.gov/crssprgm/career/contacts.jsp>



Are CAREER awards right for you?



Yes, if:

Your proposed research is innovative, ambitious and within NSF's the purview of research and education supported

You have support from your department/
organization, mentors.

You are at the right stage of your career.

CAREER Personnel and Budgets

Senior Personnel
(Consultants,
subawards,
collaborators)

Academic year
buyouts for teaching
intensive institutions



CAREER Departmental 2 Page Letter

- Statement of PI CAREER program eligibility
- Support for PI's proposed research and education activities
- Description of how the PIs career goals and responsibilities mesh with that of the organization and department
- Commitment to support professional development and mentoring of the PI
- NOT a letter of recommendation or endorsement of the PI or the research project



CAREER Awards Urban Myths

“You cannot apply because you have another NSF award. . .”

“It is an entry program, so you must first apply to CAREER. . .”

“I need to see a successful proposal to write a successful proposal. . .”

“You have no chance, if you are not from a research intensive institution.. .”

“CAREER proposals are more portable than other NSF funding.”

“The education component does not matter. . .”

“I read on the web that to succeed, I have to....”



Traits of a Successful CAREER Proposal



High quality -- This is a highly competitive program!

Matches disciplinary program expectations

Includes an appropriate scope of activities for a 5-year plan, not one's whole life!

Goes outside the education box of regular research proposals in the field

Strikes a balance between doable research activities and more risky pursuits

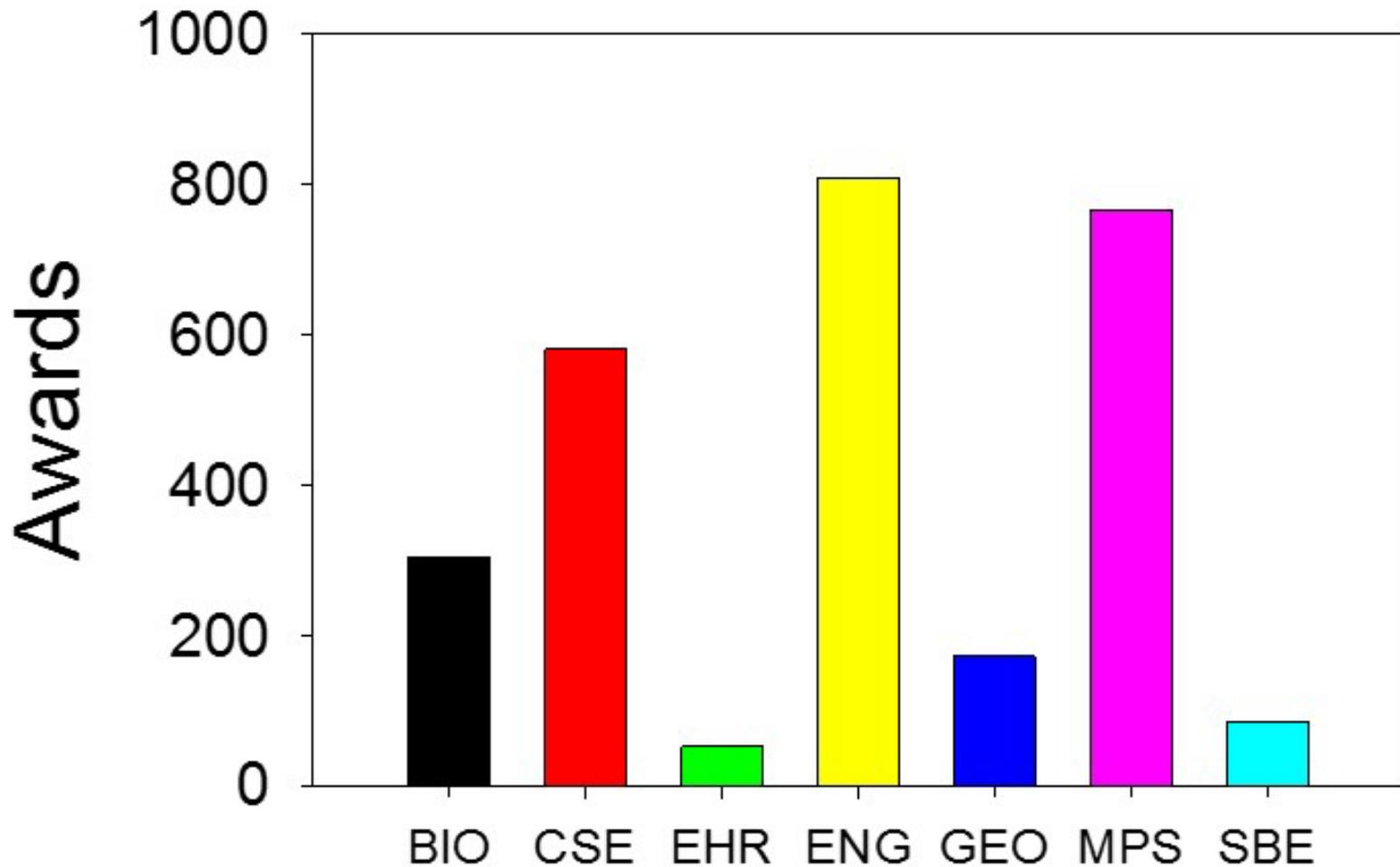


PECASE: Presidential Early Career Awards for Science and Engineering



CAREER AWARDS BY DIRECTORATE

2011 to 2016



CAREER Awards Resources

www.nsf.gov/CAREER

Program Solicitation - Dec. 2016

Frequently Asked Questions - Dec. 2016

CAREER Directorate/Division Contacts

Links to recent CAREER and PECASE awards



Questions?



Lunch Panel

LESSONS LEARNED FROM SUCCESSFUL PRINCIPAL INVESTIGATORS

Laurie E. McNeil, Professor, Department of Physics and Astronomy, UNCCH

Sheila Patek, Associate Professor, Department of Biology, Duke University

Kelly Ryoo, Assistant Professor Learning Sciences, School of Education, UNCCH

Anvar Vengosh, Professor of Geochemistry and Water Quality, Duke University

Lisa-Joy Zgorski, NSF, Office of Legislative and Public Affairs (moderator)



Crosscutting & NSF-wide Opportunities



What Is meant by crosscutting?

Sponsored by >1 NSF unit....

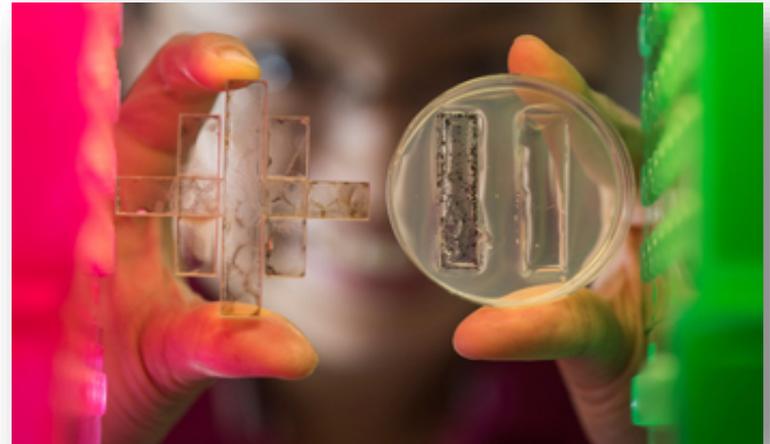
Cuts across NSF in different ways...

Collaborative with other
U.S. government agencies...



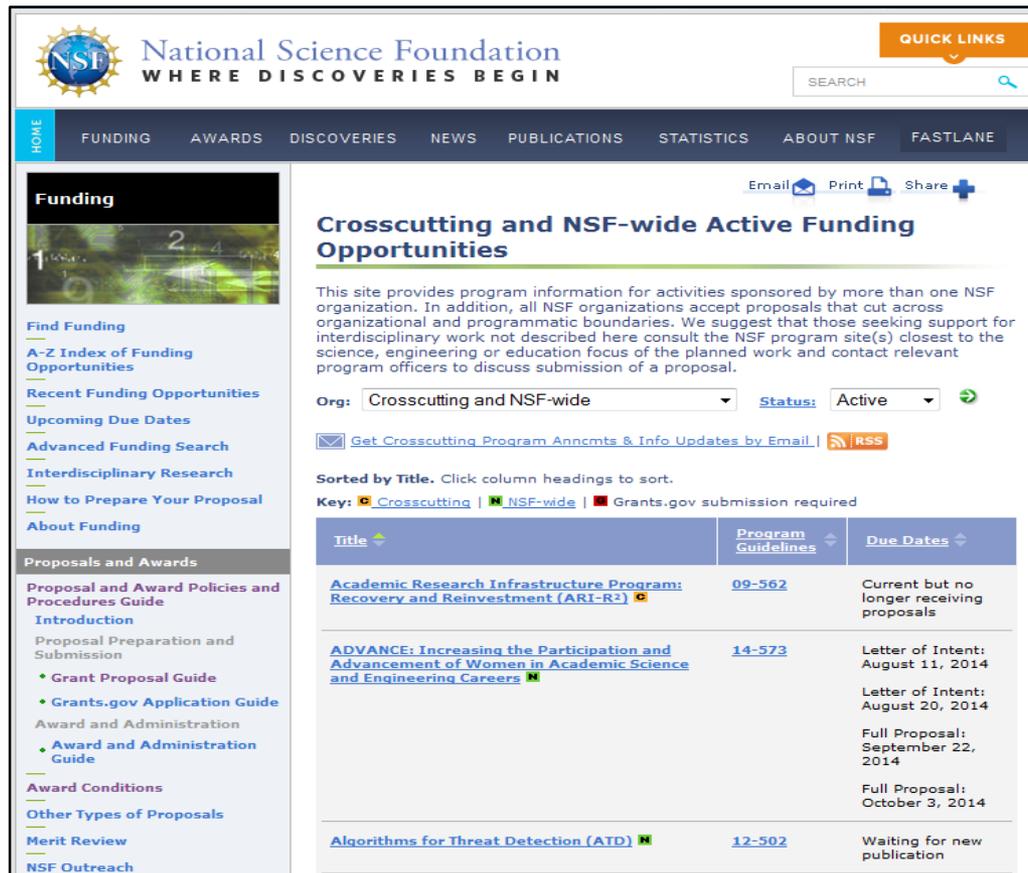
Types of Crosscutting Activities

- International
- Interdisciplinary research – theme-based (e.g., Designing Materials, Hazards and Disasters)
- People-oriented (e.g., ADVANCE, CAREER, REU, Work-Life Balance)
- Infrastructure (e.g., MRI)
- Translational (ICorps, SBIR)
- Institutional, Centers (e.g., IUCRC, STC)



Find Funding for NSF-wide and Crosscutting Opportunities

Go to: https://www.nsf.gov/funding/pgm_list.jsp?type=xcut



The screenshot shows the NSF website's funding page. The header includes the NSF logo and the tagline "WHERE DISCOVERIES BEGIN". A search bar and "QUICK LINKS" are in the top right. A navigation menu includes "HOME", "FUNDING", "AWARDS", "DISCOVERIES", "NEWS", "PUBLICATIONS", "STATISTICS", "ABOUT NSF", and "FASTLANE". The main content area is titled "Crosscutting and NSF-wide Active Funding Opportunities". It features a description of the program, search filters for "Org: Crosscutting and NSF-wide" and "Status: Active", and a table of funding opportunities. The table has columns for "Title", "Program Guidelines", and "Due Dates".

Funding

Crosscutting and NSF-wide Active Funding Opportunities

This site provides program information for activities sponsored by more than one NSF organization. In addition, all NSF organizations accept proposals that cut across organizational and programmatic boundaries. We suggest that those seeking support for interdisciplinary work not described here consult the NSF program site(s) closest to the science, engineering or education focus of the planned work and contact relevant program officers to discuss submission of a proposal.

Org: Status:

Get Crosscutting Program Annncmts & Info Updates by Email | RSS

Sorted by Title. Click column headings to sort.

Key: Crosscutting | NSF-wide | Grants.gov submission required

Title	Program Guidelines	Due Dates
Academic Research Infrastructure Program: Recovery and Reinvestment (ARI-R2)	09-562	Current but no longer receiving proposals
ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers	14-573	Letter of Intent: August 11, 2014 Letter of Intent: August 20, 2014 Full Proposal: September 22, 2014
Algorithms for Threat Detection (ATD)	12-502	Full Proposal: October 3, 2014 Waiting for new publication



RAPID/ EAGER

Grants for Rapid Response Research (RAPID)

Severe Urgency

Up to \$200K/one year

Brief project description

Internal review

EARly-concept Grants for Exploratory Research (EAGER)

Potentially transformative

Up to \$300K/one year

"High risk-high payoff"

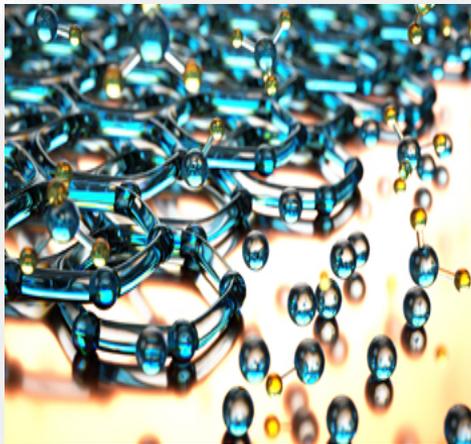
Internal review



Rare but occasional external review

Grant Opportunities for Academic Liaison with Industry - GOALI

- Promotes university-industry partnerships
- Supplies project funds or fellowships/traineeships
- Supports eclectic mix of industry-university linkages



Encourages Research that lies beyond that which industry would normally fund solo

Grant Opportunities for Academic Liaison with Industry - GOALI

Proposals accepted anytime *however . . .*

Proposals must be submitted to the appropriate disciplinary program and are subject to that program's due dates. Contact the Program Officer in charge prior to submission.

NSF funds can only go to academic institution. The industry partner is expected to participate in the research effort to facilitate in the commercialization of the research.



<http://www.nsf.gov/pubs/2012/nsf12513/nsf12513.htm>



ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers NSF-16-594



Goals:

Strategies to undertake organizational change to address gender diversity issues in STEM

Systemic approaches to increase the representation and advancement of women in academic STEM careers.

Contribute to and inform the general knowledge base on gender equity in the academic STEM disciplines.

ADVANCE – COMPONENTS

COMPETITION WILL RUN EVERY OTHER YEAR

INSTITUTIONAL TRANSFORMATION

Preliminary Proposals – April 2019

Full Proposals – January 2020

ADAPTION

Letter of Intent – August 9, 2017

Full proposal – September 13, 2017

PARTNERSHIPS

Letter of Intent – December 2018

Full proposal – January 2020





INCLUDES

- *Networked-relationships**
- *Talent from all sectors**
- *STEM workforce**
- *Spur a national conversation for “bold visions”**

- 1. Launch Pilots: planning for partners to share goals and purposes.**
- 2. Alliances: leverage pilots adding new partners.**
- 3. Backbone organizations: provide increased communications, interoperability, coordination, support and accountability for the Network of Alliances.**



Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)

Committed to enhancing the quality of undergraduate STEM education and research at HBCUs in order to broaden participation in the nation's STEM workforce and STEM graduate programs



HBCU - UP

HBCU-UP annually in the following tracks:



NSF 16-538

Research Initiation Awards

< 3 years, < \$300K

Letter of Intent: July

Proposal: October

Broadening Participation

Research Projects

< 3 years, < \$350K

Letter of Intent: September

Proposal: November



HBCU - UP

PROJECT	DURATION	AMOUNT
Targeted Infusion	≤ 3 years	\leq \$400 K
Implementation Achieving Competitive	≤ 5 years	\leq \$2 million
Excellence (ACE) Implementation	≤ 5 years	\leq \$3 million
New: Broadening Participation Research Centers	≤ 5 years	\leq \$9 million



Centers of Research Excellence in Science and Technology

- CREST Centers
- Crest Partnership Supplements
- CREST Postdoctoral Research Fellowship
- HBCU Research Infrastructure for Science and Engineering (HBCU-RISE)



NSF 16-525



HBCU-Research Infrastructure for Science and Engineering (RISE)

Awards support research capacity for doctoral programs in science and engineering.

Projects must have a unifying focus in an area supported by NSF, connect to long-term plans of the department(s) and institution, and expand institutional research capacity and production of doctoral students in STEM.

<u>PROJECT</u>	<u>DURATION</u>	<u>AMOUNT</u>
HBCU-RISE	≤ 3 years	≤ \$1 million



AGEP

Alliances for Graduate Education and the Professionals

Network of universities dedicated to increasing
the number of underrepresented minorities
obtaining graduate degrees in STEM



www.nsfagep.org

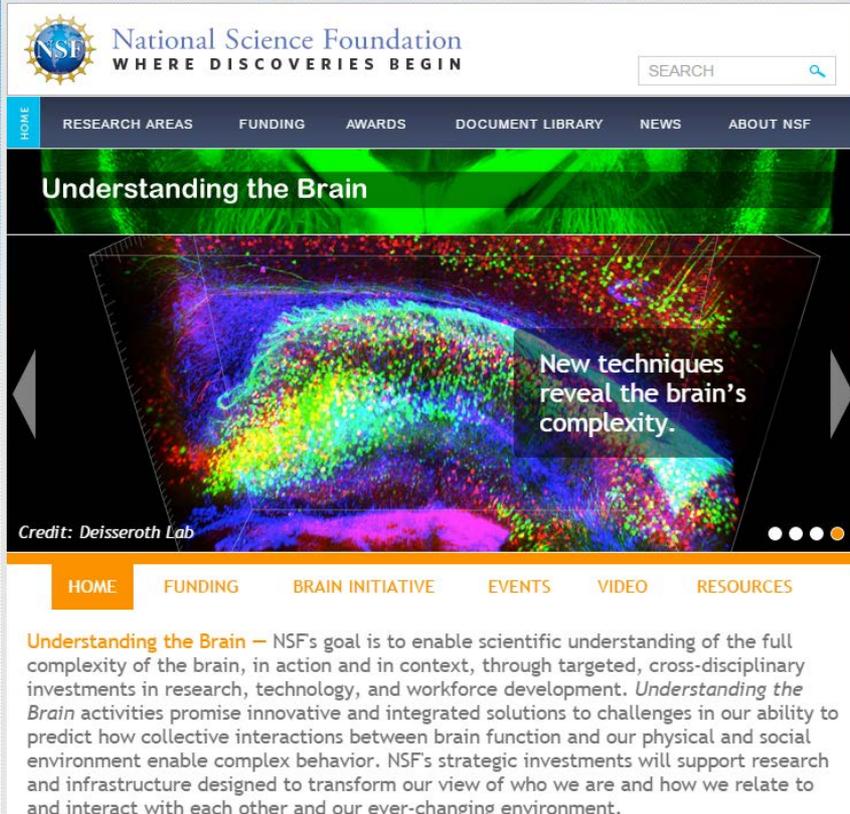
NSF 16-552



Understanding the Brain

nsf.gov/brain

To enable scientific understanding of the full complexity of the brain in action and in context through targeted, cross-disciplinary investments in research, technology, and workforce development



National Science Foundation
WHERE DISCOVERIES BEGIN

SEARCH

HOME RESEARCH AREAS FUNDING AWARDS DOCUMENT LIBRARY NEWS ABOUT NSF

Understanding the Brain

New techniques reveal the brain's complexity.

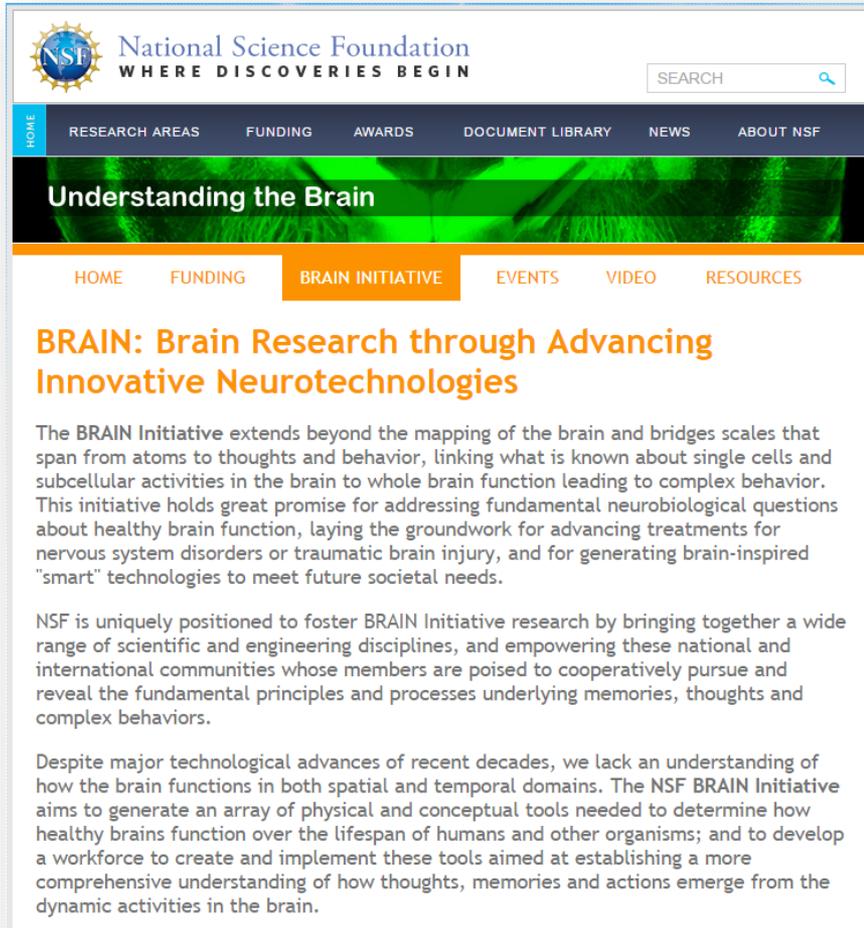
Credit: Deisseroth Lab

HOME FUNDING BRAIN INITIATIVE EVENTS VIDEO RESOURCES

Understanding the Brain — NSF's goal is to enable scientific understanding of the full complexity of the brain, in action and in context, through targeted, cross-disciplinary investments in research, technology, and workforce development. *Understanding the Brain* activities promise innovative and integrated solutions to challenges in our ability to predict how collective interactions between brain function and our physical and social environment enable complex behavior. NSF's strategic investments will support research and infrastructure designed to transform our view of who we are and how we relate to and interact with each other and our ever-changing environment.



BRAIN Initiative



The screenshot shows the NSF BRAIN Initiative website. At the top left is the NSF logo with the tagline "WHERE DISCOVERIES BEGIN". To the right is a search bar. Below the logo is a navigation menu with links for HOME, RESEARCH AREAS, FUNDING, AWARDS, DOCUMENT LIBRARY, NEWS, and ABOUT NSF. A large green banner features the text "Understanding the Brain". Below the banner is another navigation menu with links for HOME, FUNDING, BRAIN INITIATIVE (highlighted), EVENTS, VIDEO, and RESOURCES. The main content area has the heading "BRAIN: Brain Research through Advancing Innovative Neurotechnologies" in orange. Below the heading are three paragraphs of text describing the initiative's goals and the NSF's role in supporting brain research.

NSF National Science Foundation
WHERE DISCOVERIES BEGIN

SEARCH

HOME RESEARCH AREAS FUNDING AWARDS DOCUMENT LIBRARY NEWS ABOUT NSF

Understanding the Brain

HOME FUNDING **BRAIN INITIATIVE** EVENTS VIDEO RESOURCES

BRAIN: Brain Research through Advancing Innovative Neurotechnologies

The BRAIN Initiative extends beyond the mapping of the brain and bridges scales that span from atoms to thoughts and behavior, linking what is known about single cells and subcellular activities in the brain to whole brain function leading to complex behavior. This initiative holds great promise for addressing fundamental neurobiological questions about healthy brain function, laying the groundwork for advancing treatments for nervous system disorders or traumatic brain injury, and for generating brain-inspired "smart" technologies to meet future societal needs.

NSF is uniquely positioned to foster BRAIN Initiative research by bringing together a wide range of scientific and engineering disciplines, and empowering these national and international communities whose members are poised to cooperatively pursue and reveal the fundamental principles and processes underlying memories, thoughts and complex behaviors.

Despite major technological advances of recent decades, we lack an understanding of how the brain functions in both spatial and temporal domains. The NSF BRAIN Initiative aims to generate an array of physical and conceptual tools needed to determine how healthy brains function over the lifespan of humans and other organisms; and to develop a workforce to create and implement these tools aimed at establishing a more comprehensive understanding of how thoughts, memories and actions emerge from the dynamic activities in the brain.

Thematic areas of BRAIN

Multi-scale Integration of the dynamic activity and structure of the brain

Neurotechnology and research infrastructure

Quantitative theory and modeling of brain function

Brain-Inspired concepts and designs

BRAIN Workforce Development



International - A Crosscutting Portfolio

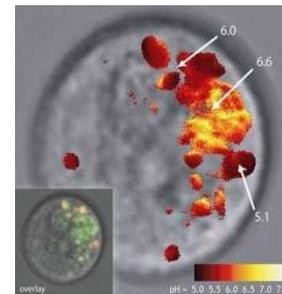
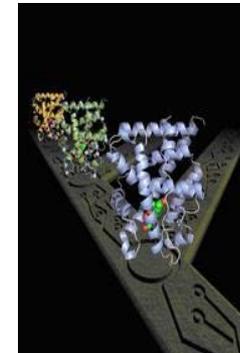
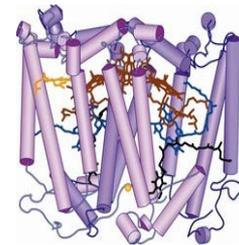
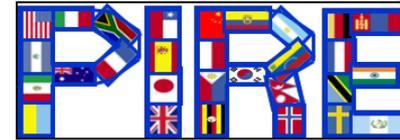
International activities at NSF

- Span all NSF Directorates and Offices
- Globalize NSF research and education
- Strengthen partnerships with international funding agencies
- Cooperate with other U.S. government agencies, private foundations

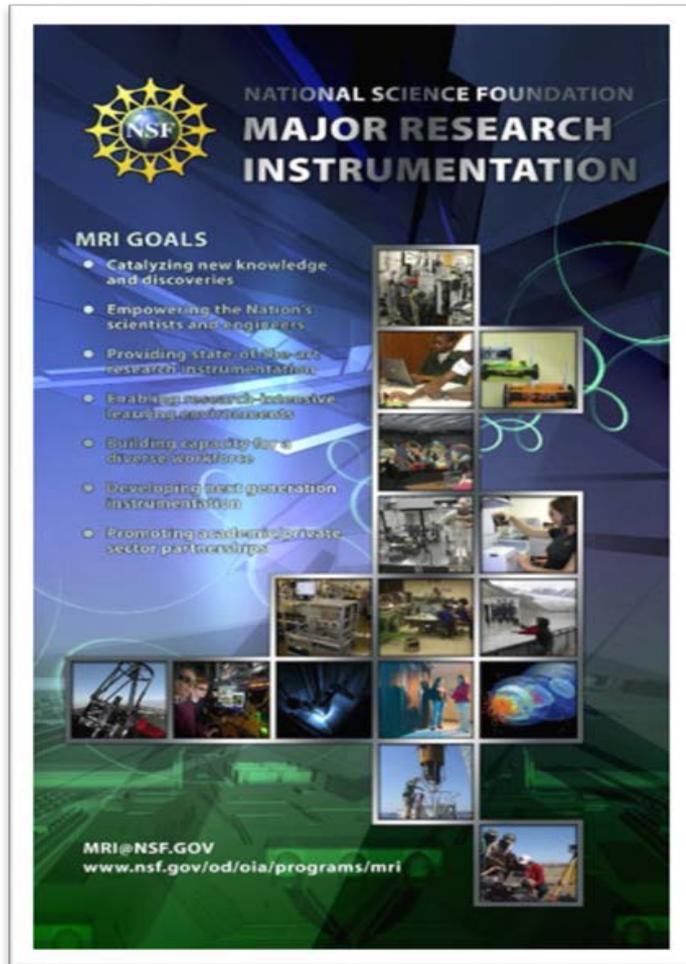


Examples of Support for International Activities

- Partnerships for International Research and Education (PIRE)
- Partnerships for Enhanced Engagement in Research (PEER) – with USAID
- International Research Experiences for Students (IRES)
- East Asia Pacific Summer Institutes for Graduate Students (EAPSI)
- (International) Postdoctoral Research Fellowship Program
- Science Across Virtual Institutes (SAVI)
- Graduate Research Opportunities Worldwide (GROW)



Major Research Instrumentation (MRI)



Goals:

- Support acquisition of major state-of-the-art instrumentation
- Foster development of the next generation of major instrumentation
- Integrate research with education
- Use, advance, expand the nation's cyber-infrastructure and/or high performance computing capability
- Promote academic & private sector instrument development partnerships



Graduate Research Fellowship Program



Goals:

- Select, recognize, and financially support early in their careers individuals with the demonstrated potential to be high achieving scientists and engineers
- Broaden participation in science and engineering of underrepresented groups, including women, minorities, persons with disabilities, and veterans





5 Year Award = \$138,000

\$34,000/year

+\$12,000 Educational allowance to institution
for any particulat3 years

Recent Change: NSF limits graduate students to only one application to the GRFP, submitted either in the first year or in the second year of graduate school.

Supercomputer access: XSEDE

Career Life Balance (family leave)

Graduate Research Opportunities Worldwide



Provides international research experiences to NSF GRFP recipients through partnerships with counterpart agencies around the world.

Open only to NSF GRFP recipients

\$5,000 NSF travel allowance plus in-country support provided by partner

Country partners: Australia, Austria, Brazil, Chile, Denmark, Finland, France, India, Ireland, Japan, Korea, Mexico, Netherlands, Norway, Singapore, Sweden, and Switzerland. Others being added.



Source: www.maps.google.com

Please see application details in the Dear Colleague Letter 16-012.

See <http://www.nsf.gov/grow> – Submission window: Sept. 11 – Dec. 4



Graduate Research Internship Program



Expands opportunities for NSF GRFP recipients

Internship allowance up to \$5,000 for travel/research costs.

Partner agencies include: Census, DHS, EPA, FBI, NOAA, ONR, SI, USDA, and USGS.

Details in DCL 16-015 and via partner agencies.

Application deadlines: Dec 4, May 6 annually





RESOURCES:

Solicitation and links

www.nsf.gov/grfp

NSF GRFP FastLane Website

www.fastlane.nsf.gov/grfp

Application, guides,
announcements, FAQs

GRFP Website, www.nsfgrfp.org

Current & former Fellows

866-NSF-GRFP, info@nsfgrfp.org



NSF Research Traineeship (NRT) Program

Encouraging the development and implementation of bold, new, and potentially transformative models for STEM graduate training

Traineeship Track – has been \$3,000,000 for up to 5 years
(Priority areas for 2018: TBD,
but expected to include DESE, UtB, INFEWS, others)

Innovations in Graduate Education (IGE) Track
has been \$300,000 - \$500,000 for 2-3 years



Research Experiences for Undergraduates



Goals:

- Initiate and conduct projects that engage a number of undergraduate students in research.
- Involve in research students who might not otherwise have the opportunity, particularly those from academic institutions where research programs are limited.

A screenshot of the National Science Foundation (NSF) website's Research Experiences for Undergraduates (REU) page. The page header includes the NSF logo and the tagline 'WHERE DISCOVERIES BEGIN'. A navigation menu lists 'HOME', 'FUNDING', 'AWARDS', 'DISCOVERIES', 'NEWS', 'PUBLICATIONS', 'STATISTICS', 'ABOUT NSF', and 'FASTLANE'. The main content area is titled 'Research Experiences for Undergraduates (REU)' and includes a 'NOTE ON THE PROPOSAL DEADLINE FOR REU SITES' section. This note states: 'Two due dates are listed for REU Site proposals each year. The May deadline applies only to REU Site proposals that require access to Antarctica, which must be submitted to one of the Antarctic Sciences Division (ANT) research programs in the Office of Polar Programs (OPP). The fall deadline (which is September 12 in 2012, and the fourth Wednesday in August in 2013 and beyond) applies to all other REU Site proposals.' Below this, there are sections for 'CONTACTS' with a link to 'NSF REU Site Contacts: http://www.nsf.gov/crsspram/reu/reu_contacts.jsp', 'PROGRAM GUIDELINES' with a link to 'Solicitation 13-542', and 'DUE DATES' with two entries: 'Full Proposal Deadline Date: August 27, 2014' and 'Full Proposal Deadline Date: May 22, 2015'. A sidebar on the left contains links for 'Find Funding', 'A-Z Index of Funding Opportunities', 'Recent Funding Opportunities', 'Upcoming Due Dates', 'Advanced Funding Search', 'Interdisciplinary Research', 'How to Prepare Your Proposal', 'About Funding', 'Proposals and Awards', and 'Proposal and Award Policies and Procedures Guide'.

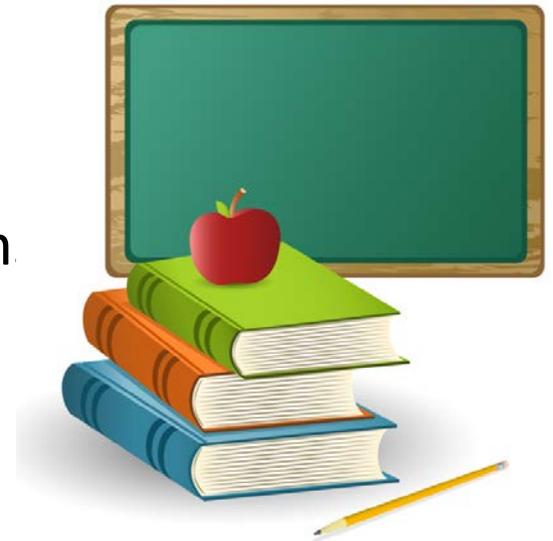


Research Experiences for Teachers



GOAL: Enable K-12 teachers and community college faculty to engage in STEM research and then adapt knowledge into their teaching.

- RET Sites and Supplements
- May be included in REU proposals
- Check Directorates for specific mechanism.



Support for Undergraduates RUI, ROA for PUIs

RUIs and ROAs support research by faculty members at PUIs.

PUIs = accredited institutions that award Associate's, Bachelor's, and/or Master's degrees but have not awarded > 20 Ph.D./D.Sci. degrees in all NSF-supported fields during the combined previous two academic years.

ALL NSF directorates evaluate and fund RUIs and ROAs

They are funded within R & E program allocations



Directorate contacts found at : http://www.nsf.gov/crsspgrm/rui_roa/contacts.jsp



Two Criteria for BIGDATA Awards

Foundational (F):

Novel techniques, or novel theoretical analysis

Innovative Applications (IA):

- Domain specific domain (BIO, GEO, ENG, EHR, MPS, SBE) application
- Advance both domain and the computational science
- High levels of innovation in computing, statistics, etc AND in domain discipline



SaTC Actual FY14 Funding Areas (128 new research projects)

Access control	Cyberwar	Personalization
Anti-malware	Digital currencies	Privacy
Anticensorship	Education	Provenance
Applied cryptography	Forensics	Security usability
Authentication	Formal methods	Situational awareness
Cellphone network security	Governance	Smart Grid
Citizen science	Hardware security	Social networks
Cloud security	Healthcare security	Sociology of security
Cognitive psychology	Insider threat	Software security
Competitions	Intrusion detection	Vehicle security
Cryptographic theory	Mobile security	Verifiable computation
Cyber physical systems	Network security	Voting systems security
Cybereconomics	Operating systems	Web security



INFEWS: Innovation at the Nexus of Food, Energy, and Water Systems

Food, energy and water systems are interrelated

- 10 percent of US energy is associated with food
- 40 percent of water withdrawals are the power plant cooling
- 30 percent of water withdrawals are for irrigation
- 3 percent of electricity is used for pumping, treating, and transporting water

INFEWS includes a central competition and DCLs associated with one or two directorates



Goal is to build a community of interdisciplinary scholars

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505241



The Central INFEWS Competition

Requires attention to food, energy and water systems

Requires involvement from disciplines support by 3 directorates

Requires a systems framework

Proposals go to one of three tracks:

Modelling

Decision support

Solutions toward sustainability



Maximum funding: \$2.5 M for 3 years, total
Future uncertain, probably return in FY2019

Critical Resilient Interdependent Infrastructure Systems & Processes

- Requires principal investigators from three directorates:
 - Computer Information Science and Engineering
 - Engineering
 - Social, Behavioral and Economic Sciences
- Requires interdisciplinary integrated research that focuses on two or more interdependent critical infrastructures
- DHS identifies 16 infrastructures as critical
- Maximum funding: \$2.5 M for 3 years, total



Improving Undergraduate STEM Education “IUSE”



Improve STEM Learning & Learning Environments



Build the Professional STEM Workforce for Tomorrow



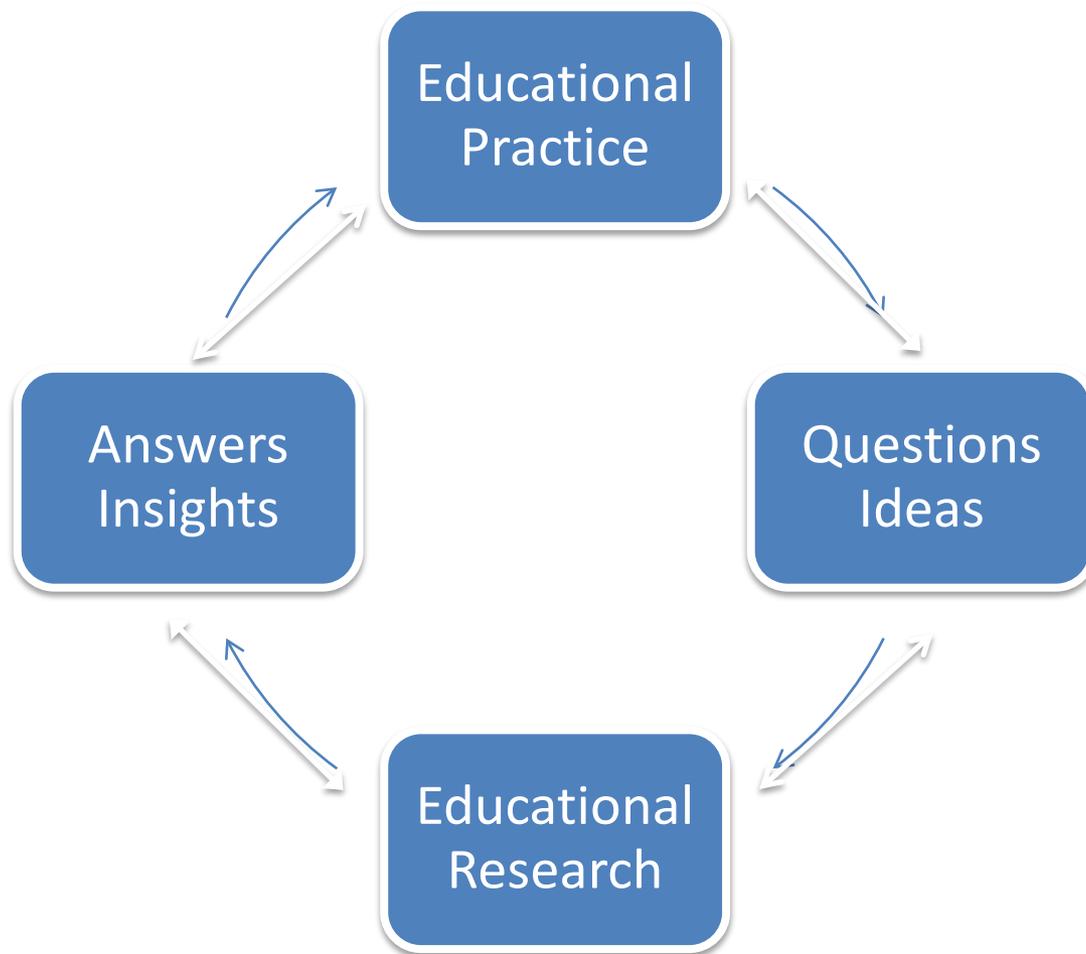
Broaden Participation & Institutional Capacity for STEM Learning



Proposals should describe projects that build on available evidence and theory, and that will generate evidence and build knowledge.

**Two Important IUSE Words:
“framework”
“flexible”**

IUSE Educational Practice and Research Cycle



IUSE: EHR

The Most Recent Solicitation:
NSF 15-585

Two Program Tracks

Engaged Student Learning

Two Approaches

**Exploration
& Design**
(smaller scale)

Up to \$300K
Up to 3 yrs

**Development
& Implementation**
(larger scale)

Level I:
Up to \$600K Up to 3 yrs
Level II:
\$601K to \$2M Up to 5 yrs

Focuses on design, development, implementation of and research on STEM learning models, approaches, and tools

Institutional and Community Transformation

Two Approaches

**Exploration
& Design**
(smaller scale)

Up to \$300K
Up to 3 yrs

**Development
& Implementation**
(larger scale)

Up to \$3M
Up to 5 yrs

Focus on approaches to increase the propagation of highly effective methods of STEM teaching and learning



Cyberlearning and Future Learning Technologies

Improving learning by integrating emerging technologies with knowledge from research about how people learn

Research Thrusts:

- **Advancing the frontiers of learning** by developing and studying new categories of technologies for learning
- **Learning** in any discipline or area by any demographics
- **Multidisciplinary proposal teams:** technology researchers and learning researchers
- **Recent Solicitation 17-520;** one type of award: EXP

- **Cyber innovation:**
- **Learning innovation:**
- **Advancing understanding of how people learn in technology-rich learning environments:**

Cross-Directorate Solicitation: CISE, EHR, and ENG



S-STEM:

NSF Scholarships in STEM Program

Scholarships + Ecosystem of Academic/Student Supports
= STEM Degrees

Goal: To improve the U.S. STEM workforce

- Supported by H1B visa fees
- Provides scholarships
 - to high-ability/potential low income students
 - up to \$10,000/year for 4-years
 - Full-time in an S-STEM supported discipline
 - U.S. citizens, permanent residents, nationals, or refugees
- Includes curricular and co-curricular activities
- Requires knowledge generation



The NSF Innovation Corps Program



I-Corps Goals

Develops scientific and engineering discoveries into technologies, products and processes that benefit society;

Engages our nation's faculty and students to *transform* discoveries into *innovative technologies* and strengthen our nation's *entrepreneurial ecosystem*





Building a National Innovation Network

I-Corps Model

- Eligible NSF PIs with ideas !
- I-Corps Team: A student entrepreneurial lead and a business mentor
- I-Corps Curriculum: Online instruction and on-site activities at an I-Corps node
- I-Corps Regional Nodes: Groups of institutions dedicated to advance entrepreneurial research and training

I-Corps Stats

- 700+ completed I-Corps Projects in 4 years
- More than 50% created start-up companies
- I-Corps trained teams are more successful





I-Corps Resources

I-Corps Solicitations

I-Corps Nodes: NSF 16-539

<http://www.nsf.gov/pubs/2016/nsf16539/nsf16539.htm>

Sites: NSF 16-547

<http://www.nsf.gov/pubs/2016/nsf16547/nsf16547.htm>

Teams: NSF 12-602

<http://www.nsf.gov/pubs/2012/nsf12602/nsf12602.htm>

NSF I-Corps Home Page

http://www.nsf.gov/news/special_reports/i-corps/index.jsp

About I-Corps

http://www.nsf.gov/news/special_reports/i-corps/about.jsp

The I-Corps Components

http://www.nsf.gov/news/special_reports/i-corps/components.jsp

Resources

http://www.nsf.gov/news/special_reports/i-corps/resources.jsp



Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) Program

SBIR/STTR Program Goals

Societal and economic benefit

Catalyze private sector commercialization

Increase incentives and opportunities for startups and small businesses to undertake cutting-edge, high-quality scientific R&D

Facilitate cooperative R&D via STTR

- ❖ Grants, not contracts – *equity-free investment*
- ❖ Seed funding for start-up and early stage technology ventures
- ❖ NSF funding *reduces risks* for other investors

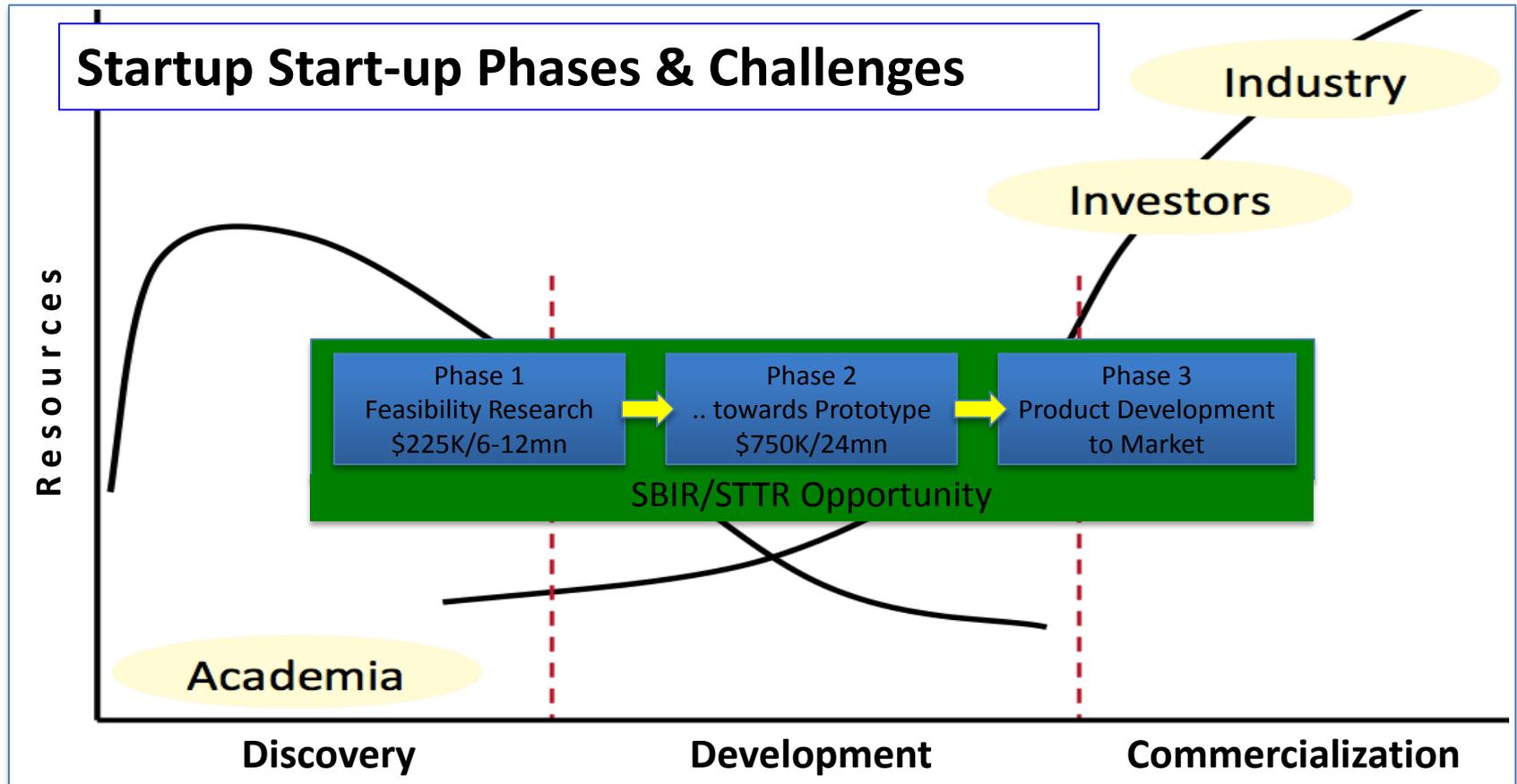


New SBIR and STTR solicitations opened in March 2016, www.nsf.gov/eng/iip/sbir/





NSF SBIR/STTR Program





NSF SBIR/STTR Program

What NSF Will and Will Not Fund in the Program

WHAT IS FUNDED

- ✓ High-tech high-risk high-reward
- ✓ R&D only
- ✓ Focus on start-ups and early stage companies
- ✓ 2014 Program Stats:
 - 72% of the companies < 5 years old
 - 90% of the companies < 10 employees
 - 80% of the companies no prior Phase II award

WHAT IS NOT FUNDED

- ✗ Basic research
- ✗ Incremental/evolutionary improvements
- ✗ Little chance of commercial success
- ✗ Sales and marketing, customer/market discovery



Questions?



Directorate Breakout Sessions

