



U.S. National Science Foundation Directorate for Biological Sciences (BIO)

Society for Integrative and Comparative Biology (SICB)

Annual Meeting

January 4, 2024

**Come meet
with us at
SICB!**

**NSF Booth #208
open through
Friday at 5pm.**

**Sign ups
available for
individual
meetings with
NSF staff.**

Integrative Organismal Systems (IOS)

Behavioral Systems Colette St. Mary, Suzy Renn

Developmental Systems Anna Allen

Neural Systems Paul Forlano, Melissa Coleman

Physiological and Structural Systems Ted Morgan,
Kathy Dickson, Miriam Ashley-Ross

Plant Genome Research Program dokamuro@nsf.gov

Leadership Denise Dearing, Michelle Elekonich

Science Advisor Julie Kellner

Science Assistant Liz Wenker

Molecular & Cellular Biosciences (MCB)

Genetic Mechanisms Steve DiFazio



About NSF BIO

BIO Priorities

How to stay informed

General Q&A

Come Meet Us!



Directorate for Biological Sciences (BIO)

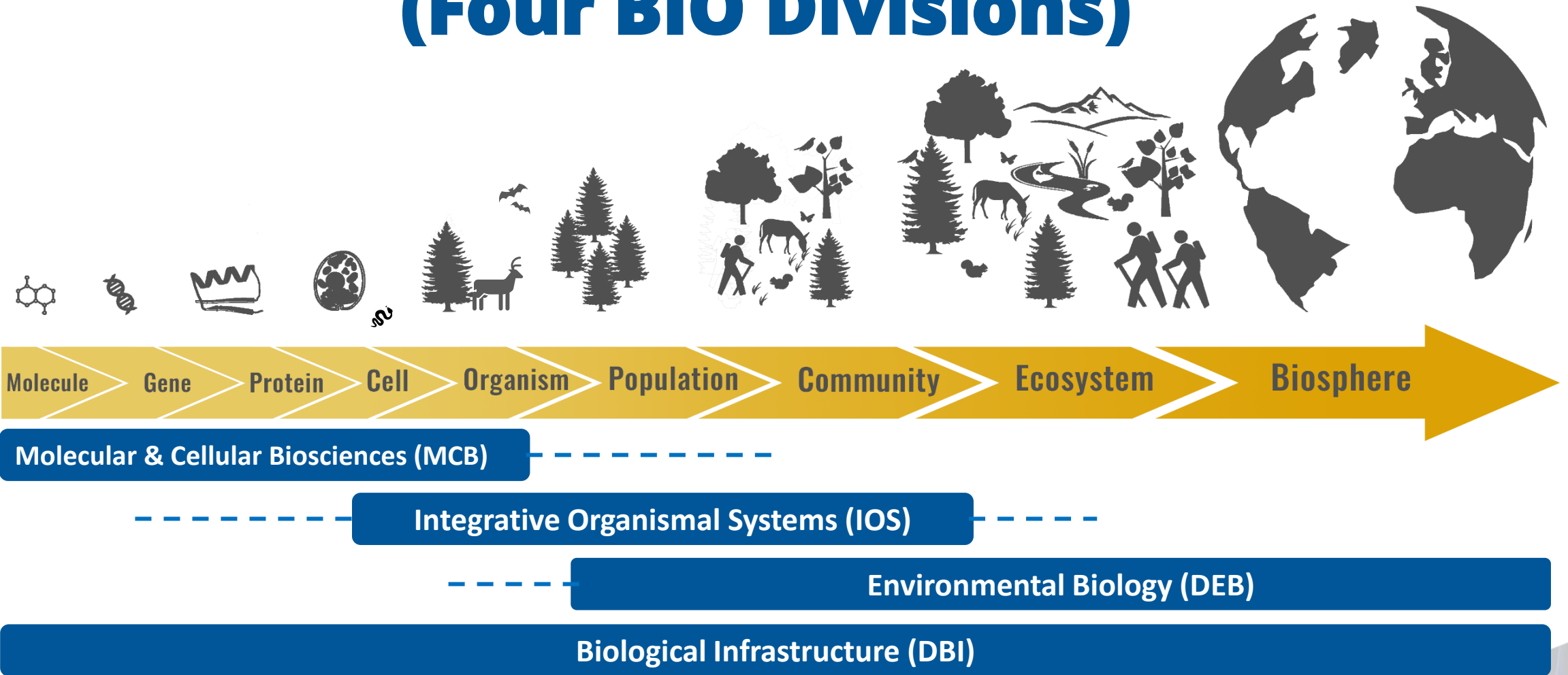
To enable discoveries for understanding life, advance the frontiers of biological knowledge, and provide a theoretical basis for prediction within complex, dynamic living systems through an integration of scientific disciplines.



<https://www.nsf.gov/bio/about.jsp>



Biological Research Across Scales (Four BIO Divisions)



Integrative Organismal Systems (IOS) Core Programs

Behavioral Systems

Animal Behavior

Developmental Systems

Plant, Fungal, and Microbial Developmental Mechanisms
Animal Developmental Mechanisms
Evolution of Developmental Mechanisms

Neural Systems

Organization
Activation
Modulation

Physiological and Structural Systems

Symbiosis, Infection, and Immunity
Physiological Mechanisms & Biomechanics
Integrative Ecological Physiology
Plant Biotic Interactions (NSF-NIFA)

Plant Genome Research Program



Molecular & Cellular Biosciences (MCB) Core Programs

Cellular Dynamics and Function

Genetic Mechanisms

Molecular Biophysics

Systems and Synthetic Biology



Environmental Biology (DEB) Core Programs

Ecosystem Science

Evolutionary Processes

Population and Community Ecology

Systematics and Biodiversity Science



IntBIO Integrative Research in Biology

Track in BIO core programs (IOS, DEB, MCB)

Supports integrative biological research that spans sub-disciplines and incorporates cutting-edge methods, tools, and concepts from each to produce groundbreaking biological discovery that is synergistic, such that the sum is greater than the parts.

The research should produce a novel, holistic understanding of how biological systems function and interact across different scales of organization, e.g., from molecules to cells, tissues to organisms, species to ecosystems and the entire Earth.

Where appropriate, projects should apply experimental strategies, modeling, integrative analysis, advanced computation, or other research approaches to stimulate new discovery and general theory in biology.



Biological Infrastructure (DBI)

Human Resources

Postdoctoral Research Fellowships in Biology (PRFB)
Research Coordination Networks in Undergraduate Biology Education (RCN-UBE)
Research Experiences for Undergraduates (REU)
Building Research Capacity for New Faculty in Biology (BRC-BIO)
Research and Mentoring for Postbaccalaureates in Biological Sciences (RaMP)
Research Experiences for Teachers Sites in Biological Sciences (BIORETS)
Leading Culture Change through Professional Societies of Biology (BIO-LEAPS)

Research Resources

Infrastructure Innovation for Biological Research (Innovation)
Infrastructure Capacity for Biological Research (Capacity)
Sustaining Infrastructure for Biological Research (Sustaining)
Major Research Instrumentation Program (MRI)

Centers, Facilities, and Additional Research Infrastructure

Biology Integration Institutes (BII)
Center for Advancement of Synthesis of Open Environmental Data and Sciences
Management of Operations and Maintenance of the National Ecological Observatory Network (NEON)
Mid-scale Research Infrastructure-1 and 2



National Ecological Observatory Network

81 field sites across 20 eco-climatic regions, including Alaska, Hawaii, and Puerto Rico

Data Products, Education & Training including data for teaching, data science workshops, and a code hub

Research Support & Assignable Assets to support community research incl. access to infrastructure.

<https://www.neonscience.org/>



Long-Term Ecological Research Network

28 sites support ecological discovery on the influence of long-term and large-scale phenomena

40 years of data available

<https://lternet.edu/using-lter-data/>



neon
Operated by Battelle



BIO Priorities



**Building a
Resilient Planet**



**Advancing the
Bioeconomy**



**Integration
Across the
Biological
Sciences**



**Creating
Opportunities
Everywhere**



IOS Synthesis Center for Understanding Organismal Resilience

Establishes a center to advance our ability to explain and predict organismal resiliency and plasticity in response to complex and dynamic environmental circumstance encountered over a lifespan through the synthesis of varies data sets at multiple scales and levels.

Preliminary proposals due **January 12, 2024**

Contact: Anna Allen (here at SICB) or email IOS-SynCenter@nsf.gov



Building a Resilient Planet

Organismal Response to
Climate Change
(ORCC)

Biodiversity on a
Changing Planet **(BoCP)**

Ecology and Evolution of
Infectious Diseases
(EEID)

Building Synthetic
Microbial Communities
for Biology, Mitigating
Climate Change,
Sustainability and
Biotechnology
**(Synthetic
Communities)**

Dear Colleague Letter
UKRI/BBSRC - NSF/BIO Lead Agency
Opportunity in Biological Informatics, Systems
Understanding of Host-Microbe Interactions,
Synthetic Cells and Cellular Systems, and
Synthetic Microbial Communities
(NSF 23-143)

Dear Colleague Letter
Organismal Systems
and Infection Biology
(OSIB)

Dear Colleague Letter
Neurobiology in
Changing Ecosystems
(NiCE)



Building a
Resilient Planet

Advancing the Bioeconomy

THE WHITE HOUSE



SEPTEMBER 12, 2022

Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy



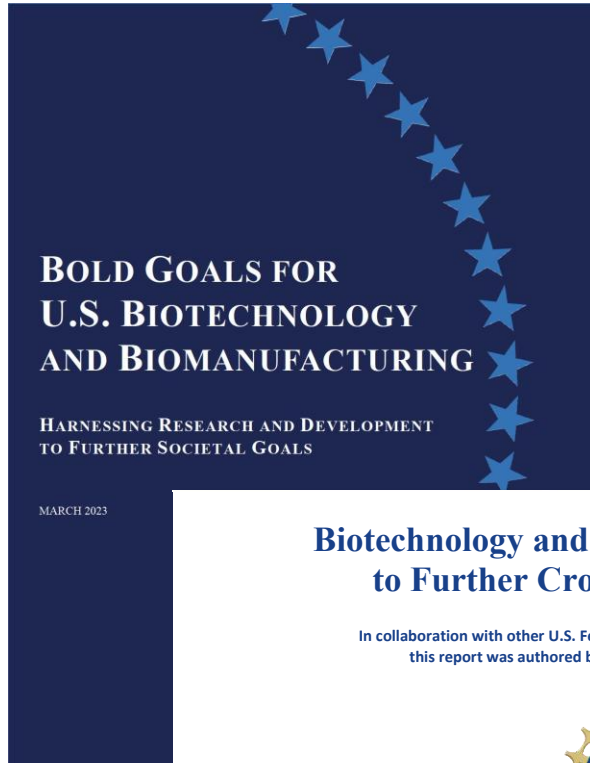
BRIEFING ROOM

PRESIDENTIAL ACTIONS

- Health
- Climate Change
- Energy
- Food Security
- Agriculture
- Supply Chain Resilience
- National and Economic Security



Advancing the Bioeconomy



Biotechnology and Biomanufacturing R&D to Further Cross-Cutting Advances

In collaboration with other U.S. Federal Government departments and agencies, this report was authored by the U.S. National Science Foundation



- Health
- Climate Change
- Energy
- Food Security
- Agriculture
- Supply Chain Resilience
- National and Economic Security



CASA Bio Catalyzing Across Sectors to Advance the Bioeconomy

Working to create a unified approach to advancing the U.S. bioeconomy across government, private sector, and research communities

Phase 1 – Stakeholders identify synergistic priorities

Phase 2 – Community input on areas of R&D exploration within priorities

How to get involved:

Phase 1: Visit www.casa-bio.net

Phase 2: April 2024 workshops in TBA



NSF 24-023 DCL: Global Centers 2024 Program Competition

Anticipated Topic: Addressing Societal Challenges through the Bioeconomy

Anticipated Priority Goals

Leveraging Biodiversity Across the Tree of Life to Power the Bioeconomy

Biofoundries (also called the Design-Build-Test-Learn process)



Advancing the
Bioeconomy

Integration Across the Biological Sciences

Enabling Discovery
through GENomics
(EDGE)

Dear Colleague Letter
Bio Inspired Design
(BIODesign)

Designing Synthetic
Cells Beyond the
Bounds of Evolution
(Designer Cells)

Collaborative Research
in Computational
Neuroscience
(CRCNS)

Joint DMS/NIGMS Initiative to
Support Research at the Interface
of the Biological and
Mathematical Sciences
(DMS/NIGMS)

Opportunities for
Promoting Understanding
through Synthesis
(OPUS)

Transitions to Excellence
in Molecular and Cellular
Biosciences Research
(Transitions)



International Collaboration Opportunities

NSF Office of International Science and Engineering (OISE)

- **AccelNet** Accelerating Research through International Network-to-Network Collaborations
- **GC** Global Centers
- **IRES** International Research Experiences for Students
- **PIRE** Partnerships for International Research and Education

Examples of Current International Collaboration Dear Colleague Letters

Canada

Czech Republic

European Union

France

Germany

India

Ireland

Israel

Romania

Switzerland

Ukraine

United Kingdom



Broadening Participation in STEM

The U.S. National Science Foundation is committed to expanding the opportunities in STEM to people of all racial, ethnic, geographic and socioeconomic backgrounds, sexual orientations, gender identities and to persons with disabilities.

Funding search

Search All fields ▾ Search i

162 filtered results

[Export results .csv](#)

You can find active funding opportunities on this page. Or, [access archived opportunities](#) or [search funded awards](#).

Filter

[Reset all filters](#)

Advancing diversity: Show only Programs included in NSF 'Broadening Participation Portfolio' ✕

Limited submissions ▾

Award type ▾

Advancing diversity ▾

Directorate ▾

Division ▾

Education level ▾

Show only NSF-wide/cross-directorate opportunities (27)



Broadening Participation in STEM

Example Programs

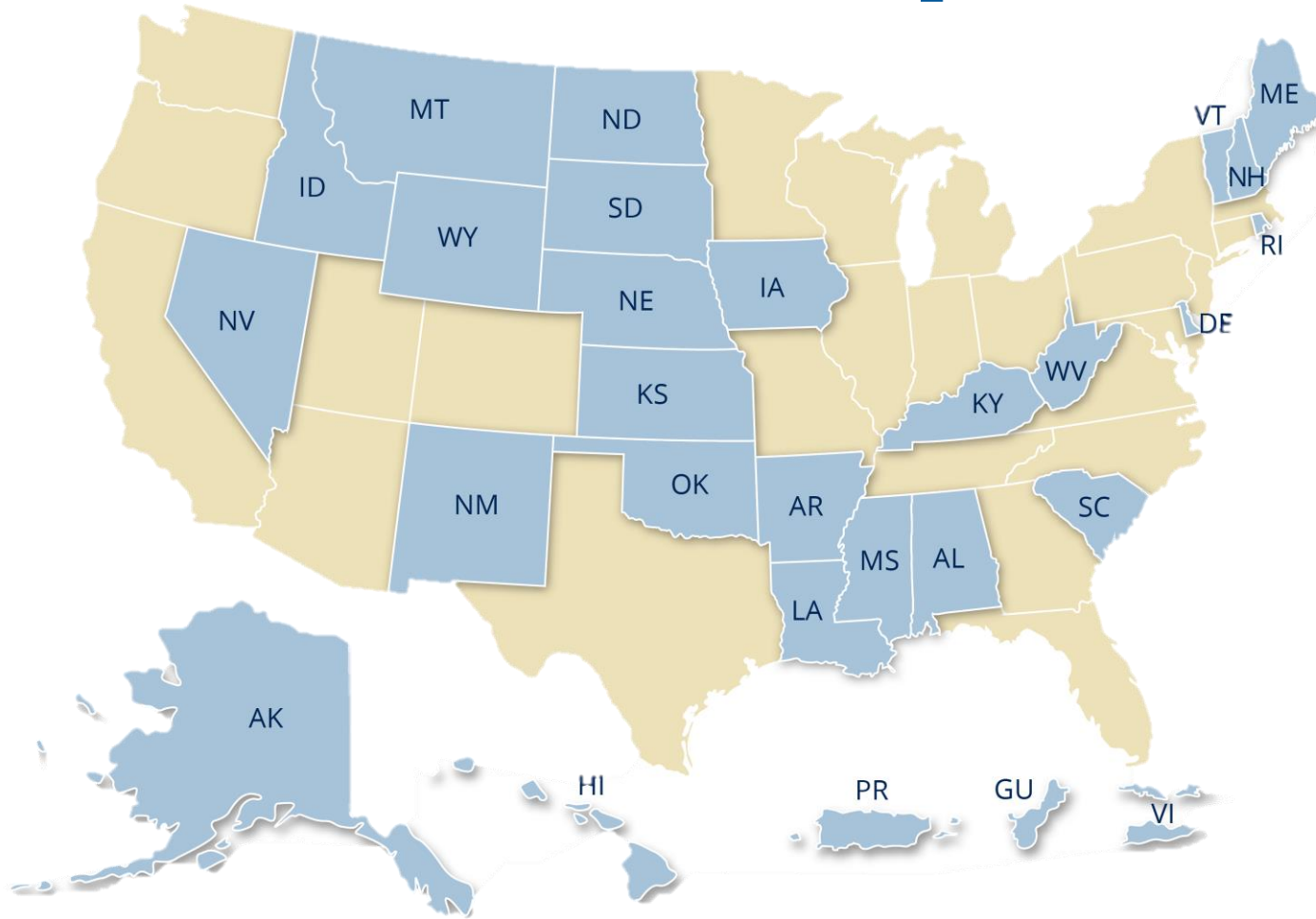
- **HBCU - EiR** Historically Black Colleges and Universities - Excellence in Research
- **HSI Program** Improving Undergraduate STEM Education: Hispanic-Serving Institutions
- **ADVANCE** Organizational Change for Gender Equity in STEM Academic Professions
- **INCLUDES** Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science Initiative

Example Dear Colleague Letters

- **STEM-APWD** STEM Access for Persons with Disabilities
- **RAHSS** Research Assistantships for High School Students: Funding to Broaden Participation in the Biological Sciences
- **VRS** Veterans Research Supplement Program



EPSCoR Established Program to Stimulate Competitive Research



AL	Alabama	NE	Nebraska
AK	Alaska	NH	New Hampshire
AR	Arkansas	NM	New Mexico
DE	Delaware	ND	North Dakota
GU	Guam	NV	Nevada
HI	Hawaii	OK	Oklahoma
IA	Iowa	PR	Puerto Rico
ID	Idaho	RI	Rhode Island
KS	Kansas	SC	South Carolina
KY	Kentucky	SD	South Dakota
LA	Louisiana	VI	U.S. Virgin Islands
ME	Maine	VT	Vermont
MS	Mississippi	WV	West Virginia
MT	Montana	WY	Wyoming



Creating Opportunities Everywhere

Supporting Researchers Throughout Their Career

STEM Professional



K - 12	Undergrad	Postbacc	Grad	Postdoc	New Faculty	Mid-Career Faculty
Research Experiences for K-12 Teachers (BIORETS)	Research Experiences for Undergrads (REU) Research Coordination Networks for Undergraduate Biology Education (RCN-UBE)	Research and Mentoring Networks for Postbaccs (RaMP)	Graduate Research Fellowships (GRFP)	Postdoc Fellowships (PRFB)	Faculty Early Career Development (CAREER) Capacity Building (BRC-BIO)	Mid-Career Advancement (MCA)

Leading Culture Change Through Professional Societies of Biology (BIO-LEAPS)

Creating Opportunities Everywhere



BRC-BIO Building Research Capacity of New Faculty in Biology

Who: Tenure-track assistant professors (within the first 3 years of their appointment) from MSIs, PUIs, and other non-R1 universities and colleges.

What: Provides support to initiate and build independent research programs. Projects should enable the establishment of sustainable research programs for faculty and enrich undergraduate research experiences to help grow the STEM workforce.

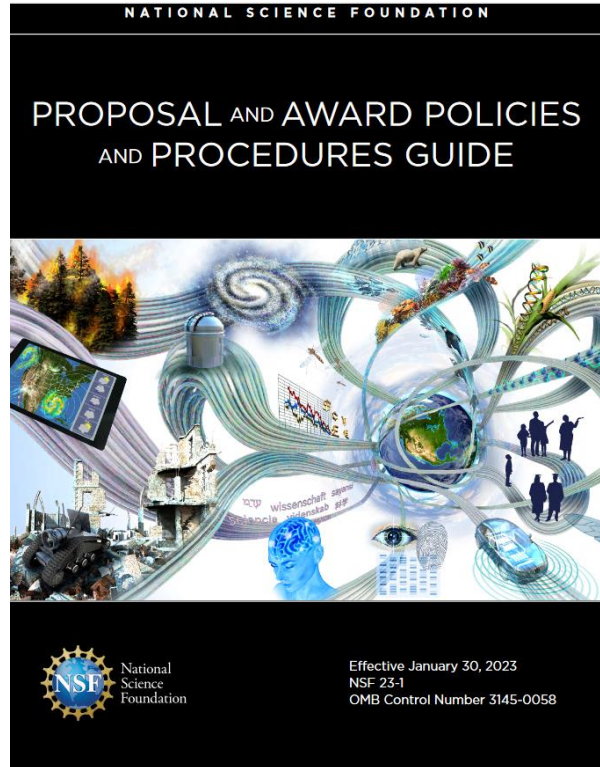
ROA Research Opportunity Awards

Who: Faculty at PUIs (awarded ≤ 20 PhDs in last 2 years)

What: ROAs enable PUI faculty to pursue research as part of a collaborative research team as visiting scientists at other NSF-supported institutions.




Essential Documents



Division of Environmental Biology (core programs) (DEB)

PROGRAM SOLICITATION
NSF 21-504

REPLACES DOCUMENT(S):
NSF 20-502

 National Science Foundation
Directorate for Biological Sciences
Division of Environmental Biology

Full Proposal Deadline(s):
Proposals Accepted Anytime

IMPORTANT INFORMATION AND REVISION NOTES

IMPORTANT INFORMATION
Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in Important Notice No. 147. In support of these efforts, the Directorate for Biological Sciences (BIO) is now requiring the use of Research.gov for the preparation and submission of proposals in response to its core programs that do not have deadline dates (see Dear Colleague Letter NSF 20-129). As such, full research proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov. Proposals also may continue to be submitted via use of Grants.gov.

NSF is taking proactive steps to move the preparation and submission of all proposals from FastLane to Research.gov, however until capabilities are fully implemented, the other types of proposals outlined in Chapter I.E of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), as well as accomplishment-based renewal proposals, must be prepared and submitted via FastLane or Grants.gov in accordance with the applicable guidance contained in the PAPPG or the NSF Grants.gov Application Guide.

REVISION NOTES
The description of the Bridging Ecology and Evolution (BEE) special category has been revised.
RoL Track: The Rules of Life (RoL) track is no longer a part of this solicitation. A new separate opportunity centered on The Rules of Life Track (RoL) is forthcoming. Sign up for NSF Updates to be notified when it is released.
Full research proposals submitted in response to this program solicitation can no longer be prepared and submitted via FastLane.
Any proposal submitted in response to this solicitation should be submitted in accordance with the NSF Proposal & Award Policies & Procedures Guide (PAPPG).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:
Division of Environmental Biology (DEB)
Core programs

Synopsis of Program:
The Division of Environmental Biology (DEB) Core supports research and training on evolutionary and ecological processes acting at the level of populations, species, communities, and ecosystems. DEB encourages research that elucidates fundamental principles that identify and explain the unity and diversity of life and its interactions with the environment over space and time. Research may incorporate field, laboratory, or collection-based approaches; observational or manipulative studies; synthesis activities; phylogenetic discovery projects; or theoretical approaches involving analytical, statistical, or computational modeling. Proposals should be submitted to the core clusters (Ecosystem Sciences, Evolutionary Processes, Population and Community Ecology, and Systematics and Biodiversity Sciences). DEB also encourages interdisciplinary proposals that cross conceptual boundaries and integrate over levels of biological organization or across multiple

PAPPG
(new version effective
Jan 30, 2024)

+

Solicitation



Safe and Inclusive Work Environments Plan BIO/GEO pilot

For participating solicitations, a required 2-page supplement including*:

1. a brief description of the field setting and unique challenges for the team;
2. the steps the proposing organization will take to nurture an inclusive off-campus or off-site working environment, including processes to establish shared team definitions of roles, responsibilities, and culture;
3. communication processes within the off-site team and to the organization(s) that minimize singular points within the communication pathway; and
4. the organizational mechanisms that will be used for reporting, responding to, and resolving issues of harassment if they arise.

***plan is in lieu of AOR certification when submitting to programs included in the pilot**



BIO Virtual Office Hours (VOH)

Informational webinars focused on:

- New and ongoing funding opportunities
- Topics of general interest
- Open questions from audience to be answered live

Dates & Times (all Eastern Time Zone)

Division of Biological Infrastructure – 3rd Tuesday from 3-4 p.m.

Division of Environmental Biology – 2nd Monday from 1-2 p.m.

Division of Integrative Organismal Systems – 3rd Thursday from 1-2 p.m.

Division of Molecular and Cellular Biosciences – 2nd Wednesday from 2-3 p.m.



BIO Blogs

News, features, highlights, virtual office hour topics,
and more from OAD and the BIO Divisions

BIO Buzz (OAD): <https://oadblog.nsfbio.com/>

DBInfo (DBI): <https://dbiblog.nsfbio.com/>

DEBrief (DEB): <https://debblog.nsfbio.com/>

IOS in Focus (IOS): <https://iosblog.nsfbio.com/>

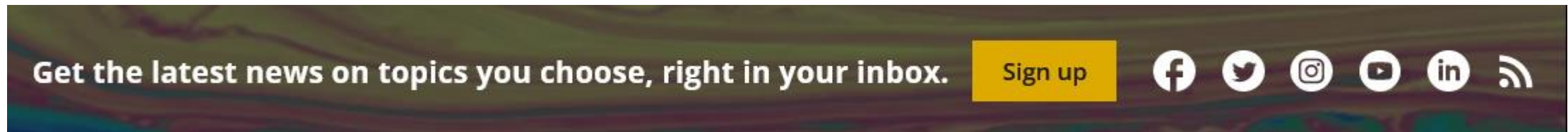
MCB Blog (MCB): <https://mcbblog.nsfbio.com/>



BIO News and Updates

Sign-up for emails on new solicitations; events; due date reminders; and BIO's quarterly newsletter, including information on new priorities and solicitations, highlights from the community, and more!

Visit www.nsf.gov and scroll down until you see the Sign up and social media banner, click on the yellow box, and follow the prompts.



NSF Needs You!



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