

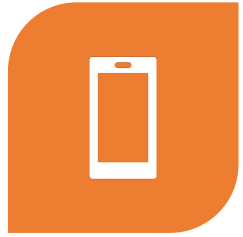


National Science Foundation

Pennsylvania State University
April 22, 2021

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Overview of
BIO &
Divisions



Proposals:
Merit Review
Criteria



Selected
Funding
Opportunities



How to
Reach Us



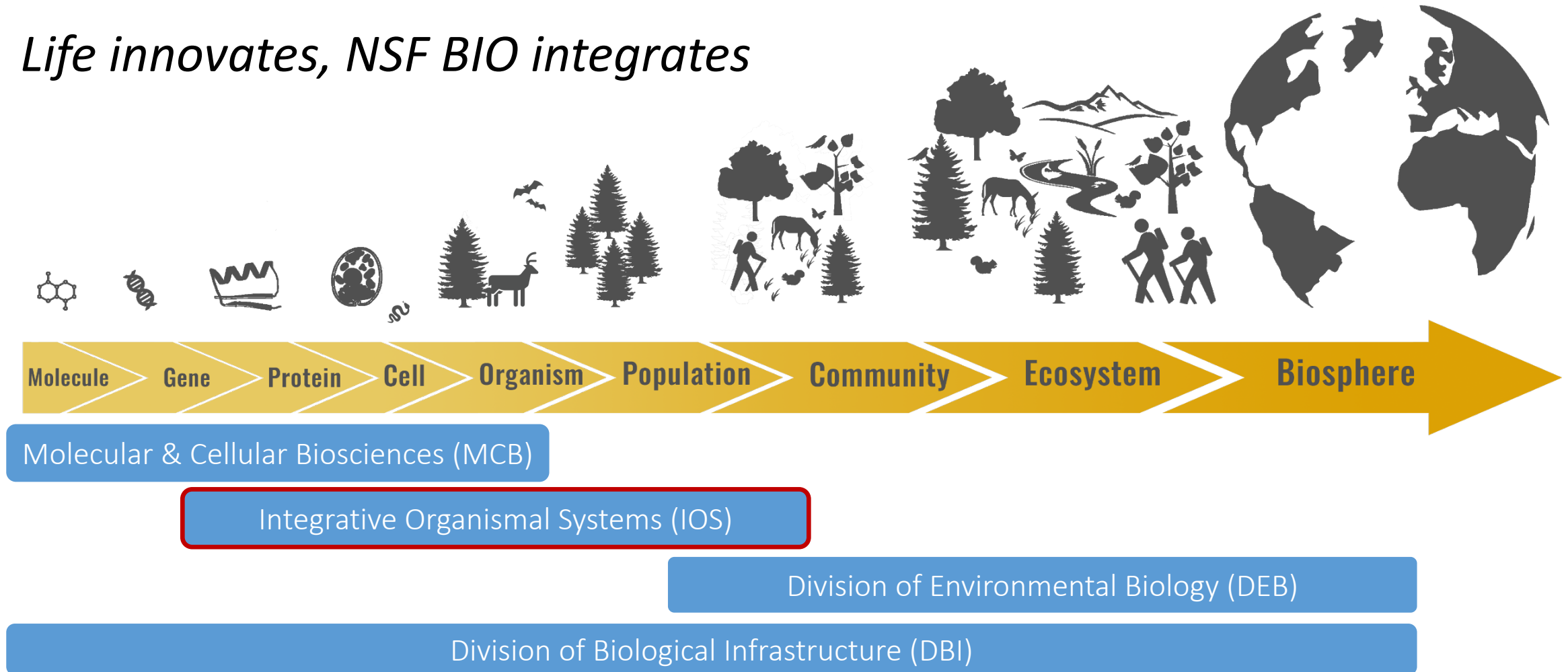
Additional
Information

Questions through Zoom function



Four BIO Divisions: Biological Research Across Scales

Life innovates, NSF BIO integrates



Integrative Organismal Systems (IOS)

Supports research to understand how organisms develop, function and behave through interactions among genotypes, and between genotypes and environments

Core Clusters and Programs

[Behavioral Systems Cluster](#)

[Developmental Systems Cluster](#)

[Neural Systems Cluster](#)

[Physiological and Structural Systems Cluster](#)

[Plant Genome Research Program \(PGRP\)](#)

[NSF-NIFA Plant-Biotic Interactions Program \(PBI\)](#)

[NSF-NHGRI Enabling Discovery through GEnomics Program \(EDGE\)](#)

Contact Program Directors with questions about programs!



Division of Environmental Biology (DEB)

Supports research and training on evolutionary and ecological processes acting at the level of populations, species, communities, and ecosystems.

Ecology Clusters

[Ecosystem Science Cluster](#)

[Population and Community Ecology Cluster](#)

Evolution Clusters

[Systematics and Biodiversity Science Cluster](#)

[Evolutionary Processes Cluster](#)

Programs

[Dynamics of Integrated Socio-Environmental Systems \(DISES\)](#)

[Ecology and Evolution of Infectious Diseases \(EEID\)](#)

[Long-Term Ecological Research \(LTER\)](#)

[Long Term Research in Environmental Biology \(LTREB\)](#)

[Macrosystems Biology and NEON-Enabled Science \(MSB-NES\)](#)

[Opportunities for Promoting Understanding through Synthesis \(OPUS\)](#)

Contact Program Directors with questions about programs!



NSF Merit Review Criteria

Intellectual Merit and Broader Impact

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

Individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan to document the outputs of those activities

[NSF Proposal & Award Policies & Preparation Guide](#)



Funding Opportunities of Interest



<https://agsci.psu.edu/safes>



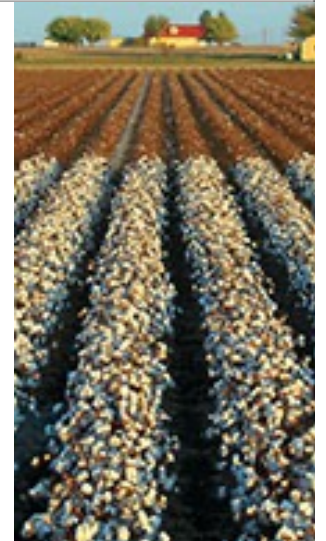
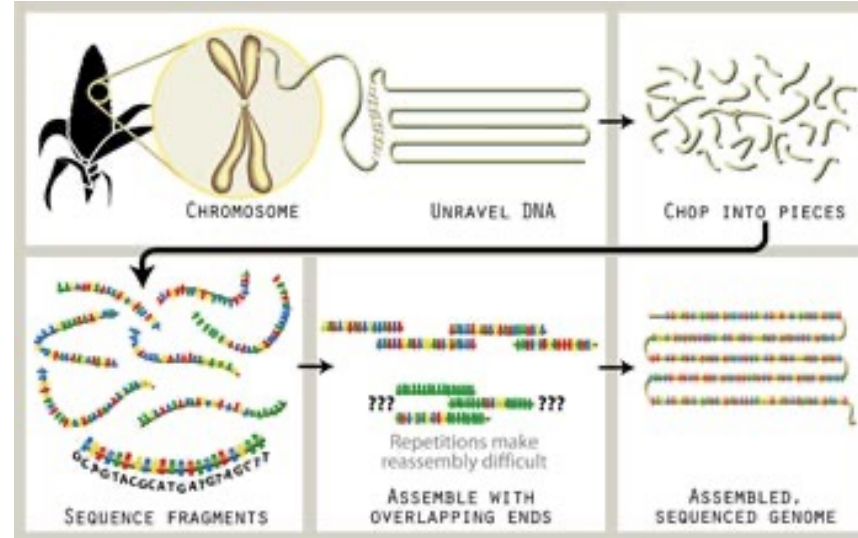
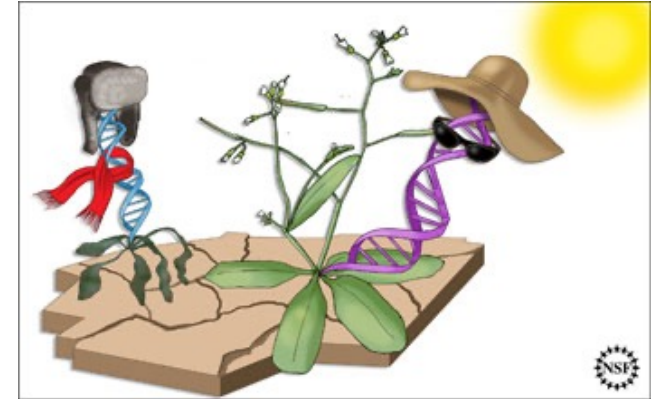
Plant Genome Research Program

Study of structure and function of plant genomes and tools for functional genomics

- **RESEARCH-PGR:** Genome-scale research on species of societal and economic importance
- **TRTech-PGR:** Tools, resources and technology breakthroughs that enable functional plant genomics
- **SynBio:** Encouraging proposals in Plant Synthetic Biology

[NSF 21-507](#)

No deadline!



Postdoctoral Fellowships in Biology

Three Tracks (*deadline pending; usually in November*)

- (1) Broadening Participation** of Groups Underrepresented in Biology
- (2) Integrative Research** Investigating the Rules of Life Governing Interactions Between Genomes, Environment, and Phenotypes
- (3) Plant Genome** Postdoctoral Research Fellowships

Contact Program Directors with questions about the program!

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503622



NSF/USDA-NIFA: Plant Biotic Interactions

Study of beneficial and antagonistic interactions between plants and viral or biotic symbionts, pathogens and pests

- **Systems** may be model, agricultural, non-model
- **Broad approaches** can be proposed
- **Proposals** should be justified
 - in terms of fundamental biology and/or relevance to agriculture
 - may be purely fundamental, translational or both

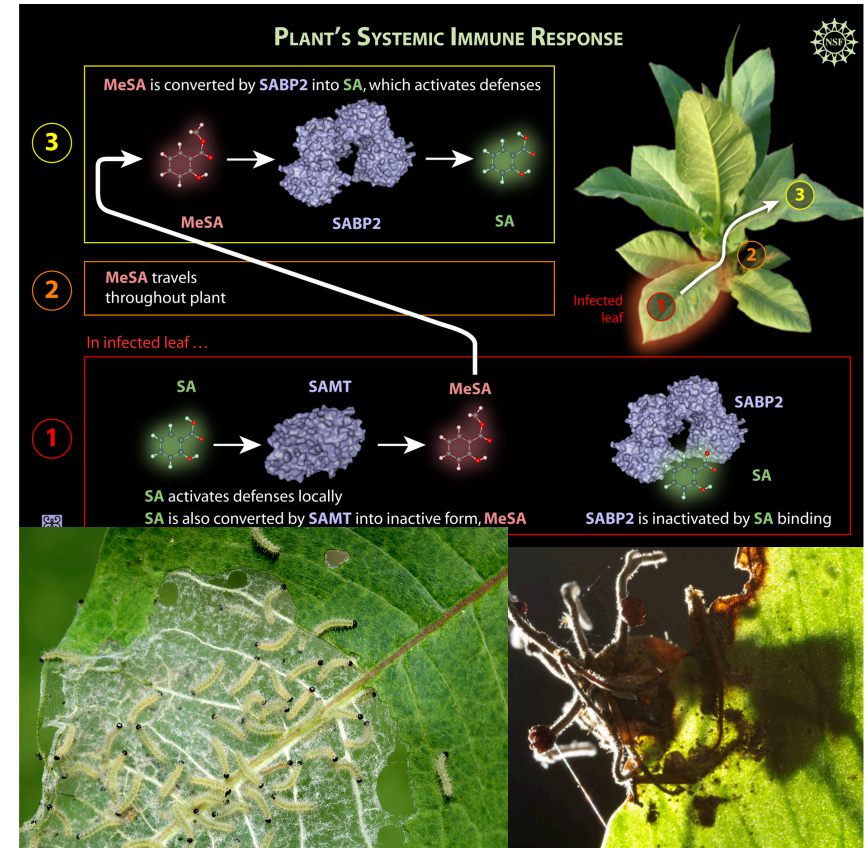
Ann Lichens-Park: ann.park@usda.gov

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[NSF 20-576](#)

No deadline!



NSF Research Traineeship Program (NRT)

NRT Goals (NSF 21-536): development of innovative models for graduate training (research-based master's and doctoral degree programs) in high priority, interdisciplinary or convergent research areas

Key Traineeship Elements

- Interdisciplinary/Convergent Research & Training
- Inclusive Workforce Development
- Institutional capacity building and transformation

Next deadline is September 6, 2021; annually on this date thereafter

Contact Program Directors with questions about programs!



NSF Opportunities for Specific Career Stages

Faculty Early Career Development Program (CAREER) – [NSF 20-525](#)

- Pre-tenure faculty focus
- Emphasis on integrating research and education

Mid-Career Advancement Program (MCA) – [NSF 21-516](#)

- Associate Professors with at least three years at that rank
- Goal is to advance research programs through synergistic partnerships

Contact Program Directors with questions about programs!





Convergence Accelerator

NSF Convergence Accelerator & Current Funding Opportunity

CONNECT WITH US!

www.nsf.gov/od/oia/convergence-accelerator/

Convergence-Accelerator@nsf.gov



April 22, 2021



Convergence Accelerator Program Structure

IDEATION (DCL/RFI, WORKSHOPS):

Selected by gathering input from the community. Identified topics must meet a societal need at scale, be built upon foundational research, and be suitable for a multidisciplinary, convergence research approach.

PHASE I (PLANNING):

Up to \$750K over 9 months is provided to further develop the initial concept (building upon basic research), identify new team members/partners, participate in a hands-on **innovation curriculum**, and develop an initial/low-fidelity prototype.

PHASE II (IMPLEMENTATION):

Up to \$5M over 24 months to develop solution prototypes and to build a sustainability model to continue impact beyond NSF support.



More Information about NSF: BIO Virtual Office Hours

- BIO Directorate and each Division offers VOH
- Monthly (or periodic) informational webinar focused on:
 - New and ongoing funding opportunities
 - Topics of general interest
 - Open questions from audience to be answered live
- Log-on information and dates/times for Virtual Office Hours can be found in BIO and Division blogs





Follow us on social media!

www.nsf.gov/social



Sign up to receive BIO blogs

[BIO Buzz](#)

[IOS InFocus](#)

[DBInfo](#)

[DEBrief](#)

[MCB Blog](#)

Follow NSF updates (*Google “NSF updates subscribe”*)





National Science Foundation

Questions?

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Additional Information, Details and More Resources



Signals in the Soil (SitS)

NSF [1745824](#): Subterranean Macroscope [Workshop](#) - University of Chicago



UK Research and Innovation

- **2018** – [NSF 18-047](#): Dear Colleague Letter: Signals in the Soil (SitS) - NSF (ENG, BIO, CISE, GEO) - [Awards](#)
- **2018/2019** - [NSF 18-097](#): Dear Colleague Letter: Planning for New SitS-Themed NSF Industry/University Cooperative Research Centers (IUCRCs) – NSF (ENG, CISE, GEO) - [Awards](#)
- **2019** – [NSF 19-556](#): Signals in the Soil - NSF (ENG, BIO, CISE, GEO), USDA NIFA, and UKRI (NERC, BBSRC, EPSRC, STFC) - [NSF Awards](#)
- **2020** – [NSF 20-548](#): Signals in the Soil – NSF (ENG, BIO, CISE, GEO, MPS) and USDA NIFA – [NSF Awards](#)
- **2021 - 2022** – **Solicitation under revision, deadline pending**

Five Themes:

- **Novel Sensors:** Sensing soil biological/metagenomics, chemical, or physical characteristics; inexpensive, buried
- **Wireless Systems:** Advances in wireless communications to collect and transmit data from sensors buried in soils.
- **Advanced Cyber Systems & Data Analytics:** For data fusion & analytics of sensor outputs (visualization, reporting tools, etc.).
- **Understanding Biological Entities/Soil/Organism Interactions:** Advances in knowledge of signaling and interactions between species and soil.
- **Modeling Soil Ecosystems:** Next-generation dynamic models of soil bio, chem, and/or physical components, describing interactions among processes at different temporal and spatial scales.



CONVERGENCE ACCELERATOR

Additional Information

Learn about the Convergence Accelerator program model and funded portfolio at:

www.nsf.gov/od/oia/convergence-accelerator

References for 2021 Solicitation (NSF-21-572)

- **2020 Workshops for 2021 Topics:**

- **Funded Workshop that led to the Networked Blue Economy track topic:** *Future of Oceans: Innovation, Exploration, and Utilization*, led by MIT: <http://bit.ly/FutureofOceansReport>
- **Funded Workshop that led to the Trust & Authenticity in Communication Systems track topic:** *Inauthentic Behavior in Online and Digital Systems*, led by University of Chicago: <http://bit.ly/InauthenticBehaviorOnlineDigitalSystemsReport>
- All 2020 funded workshops can be found at <https://www.nsf.gov/od/oia/convergence-accelerator/resources.jsp>



ACCELERATING OCEAN INNOVATION THROUGH THE NETWORKED BLUE ECONOMY

The overarching goal is to interconnect the Blue Economy and accelerate convergence across ocean sectors. Collectively, funded research teams will produce innovative tools, techniques, methods, and educational resources, as well as produce solutions that improve human engagement with oceans as both an environment and resource.

- Create a smart, connected, and open ecosystem
- Improve engagement with ocean resources through interconnected tools and methods
- Develop avenues for a more sustainable engagement with the ocean



Convergence Accelerator

www.nsf.gov/od/oia/convergence-accelerator



ACCELERATING SOLUTIONS IN TRUST & AUTHENTICITY IN COMMUNICATIONS SYSTEMS

The overarching goal is to address the urgent need for tools and techniques to help our nation effectively prevent, mitigate, and adapt to critical threats to communication systems.

- Increase citizen trust in public information through research platforms, tools, and educational materials
- Produce solutions to enable trustworthy communications systems
- Develop tools to protect communications systems



Convergence Accelerator

www.nsf.gov/od/oia/convergence-accelerator



NSF Merit Review Criteria: Intellectual Merit

- Potential for advancing knowledge in/across fields
- Creative, original, and potentially transformative concepts
- Focus on a fundamental question or gap in knowledge
- Organization and rationale of the ideas/experimental plan
- Qualifications of the investigators
- Access to resources

[NSF Proposal & Award Policies & Preparation Guide](#)



NSF Merit Review Criteria: Broader Impact

How does the project benefit society? Some examples:

- Impact and applications of the research results
- Enhancing infrastructure for research and education
- Developing a diverse, globally competitive STEM workforce
- Increasing scientific literacy and public engagement
- Promoting teaching, training and education
- Broadening participation of underrepresented groups



Additional Resources for Broader Impacts

- NSF Commitment to Broadening Participation: <https://www.nsf.gov/od/broadeningparticipation/bp.jsp>
- NSF INCLUDES (National Network): <https://www.includesnetwork.org/home>
- Committee on Equal Opportunities in Science and Engineering (CEOSE): <https://www.nsf.gov/od/oia/activities/ceose/>
- Information and video about Broader Impacts: <https://www.nsf.gov/od/oia/special/broaderimpacts/>
<https://www.nsf.gov/od/oia/special/broaderimpacts/broader-impacts-video.jsp>
- Advancing Research Impact in Society (ARIS): <https://www.researchinsociety.org/>



Advice for Writing an Excellent NSF Research Proposal (for both Intellectual Merit and Broader Impact)

- Write to your audience
- Frame a big picture
- Identify significant needs, gaps, and hypotheses
- Describe the plan to address the needs, gaps, and hypotheses
- Emphasize creative or innovative aspects
- Provide proof-of-concept or a track record to demonstrate feasibility
- Describe the expected outcomes, metrics, and evaluation
- Anticipate possible problems and describe alternative plans
- Relate the outcomes to what you set out to do



What about Medical Research?

- **Research with disease-related goals** – etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in humans or animals – **is normally not supported.**
- **Animal models** of disease conditions or the **development or testing of drugs** or other procedures for their **treatment** also are **not eligible for support.**
- **Research in bioengineering or information technology**, with diagnosis- or treatment-related goals, that applies engineering or computer science principles to problems in biology and medicine while advancing engineering or computer science knowledge **is eligible for support.**
- **Bioengineering and assistive information technology research** to aid persons with disabilities **is eligible for support.**

NSF Proposal & Award Policies & Preparation Guide

https://www.nsf.gov/pubs/policydocs/pappg20_1/index.jsp#A



Where to Find Program Information

BIO website: <https://www.nsf.gov/dir/index.jsp?org=BIO>

The screenshot displays the NSF Biological Sciences (BIO) website. At the top left is the NSF logo with the tagline "WHERE DISCOVERIES BEGIN". A search bar is located at the top right. A dark blue navigation bar contains the following items: NSB, Research Areas (circled in orange), Funding, Awards, Document Library, News, and About NSF. Below this is a sub-navigation bar for "Biological Sciences (BIO)" with a dropdown menu. The dropdown menu includes: Biological Sciences (BIO) Home, About, Programs, Staff (indicated by a yellow arrow), Funding, Awards, News, Events, and Additional Resources. Below the dropdown are links for various programs: Biological Infrastructure (DBI), Environmental Biology (DEB), Emerging Frontiers (EF), Integrative Organismal Systems (IOS), and Molecular and Cellular Biosciences (MCB), each with a right-pointing arrow (indicated by orange arrows). The main content area features a large banner for "Molecular and Cellular Biosciences (MCB)" with a "READ MORE" button. Below the banner are two columns: "Announcements" and "News". The "Announcements" column lists "Changes to Proposal Submissions in FY2018", "Employment Opportunities for BIO Program Director Positions", and "BIO Program Director and Reviewer Opportunities". The "News" column lists "Peeling back the darkness of M87", "To protect stem cells, plants have diverse genetic backup plans", and "Research helps farmers pinpoint high-and low-yield fields, leads to better use of fertilizer".

Where to Find Program Information

NSF website: www.nsf.gov

Scroll down the page to ...

The image shows a screenshot of the NSF website's 'FUNDING OPPORTUNITIES' section. The background is a solid blue color. At the top, the text 'FUNDING OPPORTUNITIES' is written in white, bold, uppercase letters. Below this, there is a search bar with the placeholder text 'Enter search term' and a dark blue 'GO' button to its right. Underneath the search bar is a dropdown menu labeled 'View by Program Area' with the text 'Select One' and a downward-pointing arrow. Below the dropdown menu is a large orange button with the text 'VIEW ALL FUNDING OPPORTUNITIES' in white, uppercase letters and a white right-pointing arrow. At the bottom of the section, there are four links in white text: 'Proposal and Award Policies and Procedures Guide', 'Prepare a Proposal', 'Upcoming Due Dates', and 'Submit Proposal to FastLane'.

FUNDING OPPORTUNITIES

Search Funding Opportunities

Enter search term **GO**

View by Program Area

Select One ▼

VIEW ALL FUNDING OPPORTUNITIES >

Proposal and Award Policies and Procedures Guide

Prepare a Proposal

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