Student Research Opportunities through the U.S. National Science Foundation: Undergrad and Early Grad (mentors included)

Suzy C.P. Renn, Program Director
Division of Integrative Organismal Biology (IOS), Behavioral Systems Cluster
Directorate for Biological Sciences (BIO)
U.S. National Science Foundation (NSF)

Society for Integrative and Comparative Biology 2024
Seattle WA Jan 2- 6

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 dbipgr@nsf.gov

Leadership Denise Dearing, Michelle Elekonich

Science Advisor Julie Kellner

Administrative Staff Liz Wenker,

Molecular & Cellular Biosciences (MCB)

Genetic Mechanisms Steve DiFazio

The Government of the United States

(way oversimplified)

The Constitution

Executive Branch

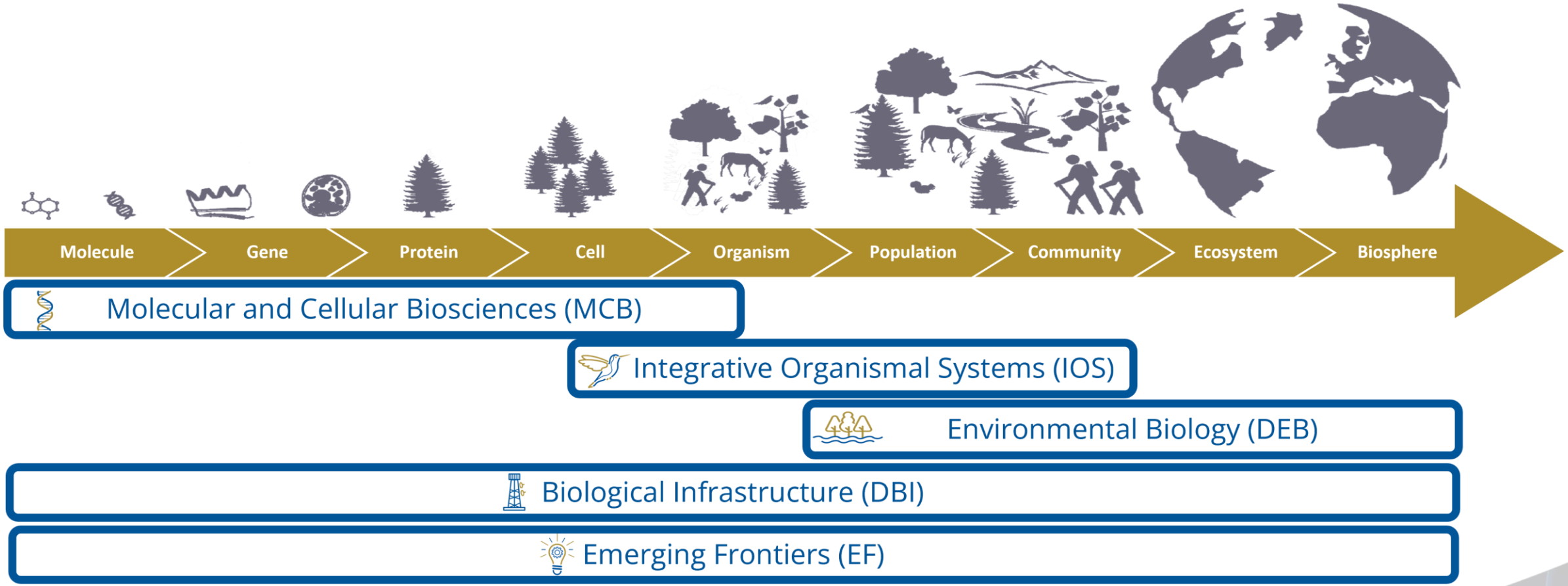
Legislative Branch

Judicial Branch

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.

How the BIO Divisions Support Research Across Scales



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 and Biomechanics
Integrative Ecological Physiology
Plant Biotic Interactions (NSF-NIFA)

Plant Genome Research Program

Special Programs & Tracks

Enabling Discovery through GEnomics **(EDGE)**

Organismal Response to Climate Change **(ORCC)**

Bio Inspired Design **(BIODesign)**

Environmental Biology (DEB)

Core Programs

Ecology
Ecosystem Sciences
Population and Community Ecology

Evolution
Evolutionary Processes
Systematics and Biodiversity Science
PurSUiT and ARTS

Special Programs & Tracks

Biodiversity on a Changing Planet **(BoCP)**	Ecology and Evolution of Infectious Diseases **(EEID)**	Long-Term Ecological Research **(LTER)**	Long-Term Research in Environmental Biology **(LTREB)**	Opportunities for Promoting Understanding through Synthesis **(OPUS)**

Molecular & Cellular Biosciences (MCB)

Core Programs

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

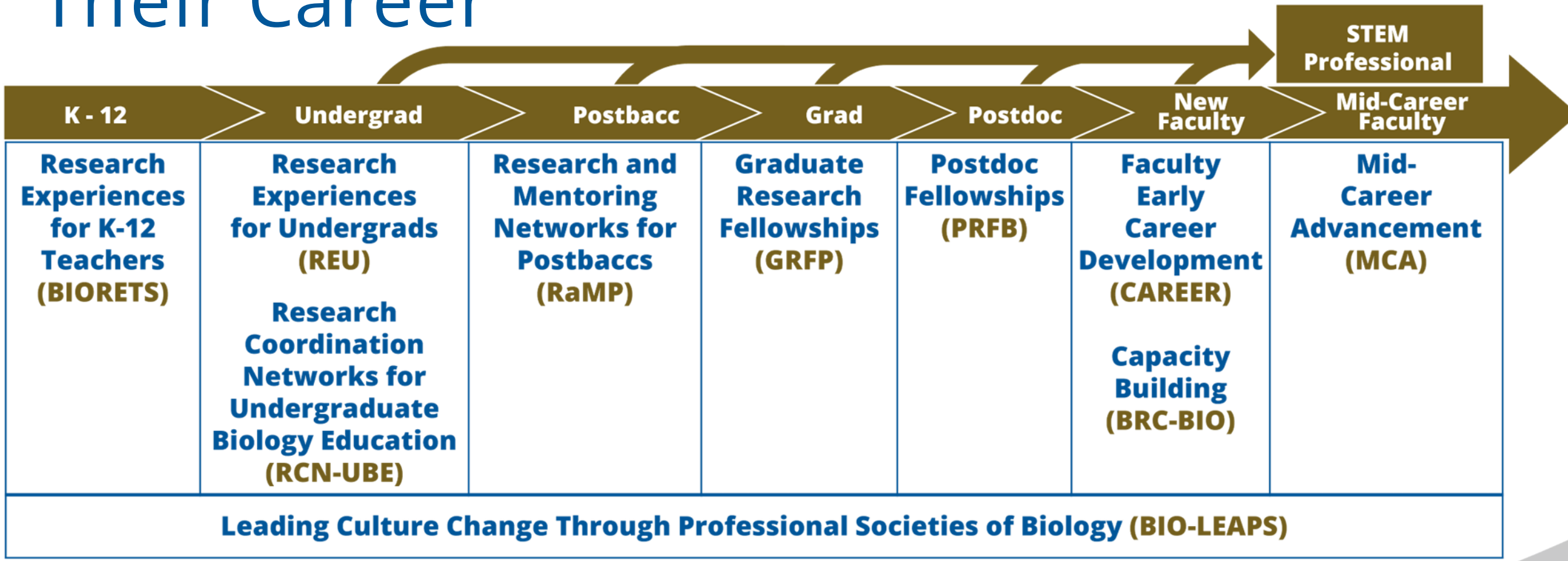
Special Programs & Tracks

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

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

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

Supporting Researchers Throughout Their Career



REU: Research Experiences for Undergraduates (P.I. perspective)

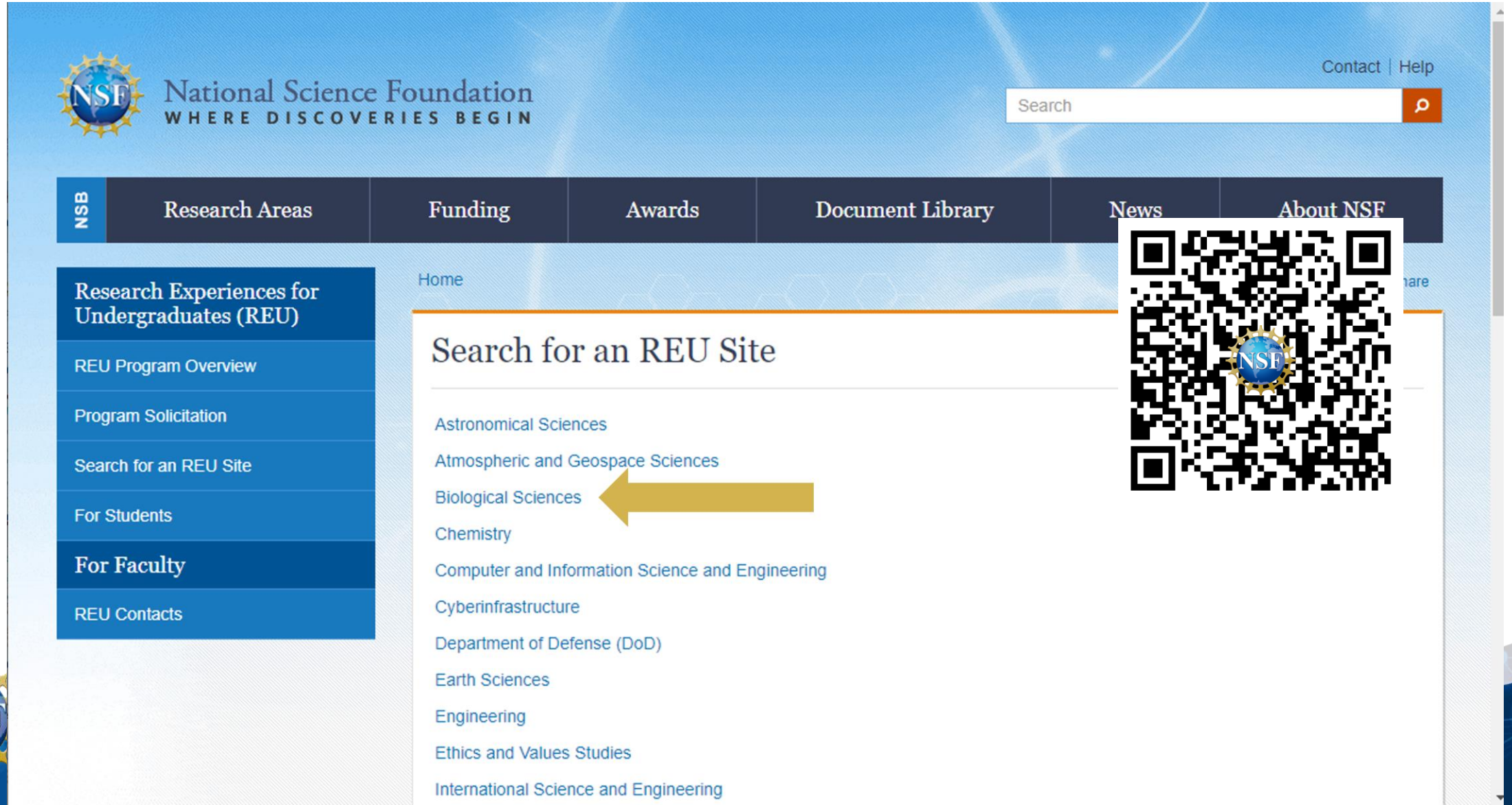
- Synopsis
  - Provides funding to engage undergrads in research
  - Two mechanisms:
    1. REU Sites: Centralized training of a group of undergrads in a theme-focused bioscience research. Sites include immersive dive into science and activities to develop student professional skills.
    2. REU Supplements: Supplements to new or existing awards to engage one or more students in the research activity

REU: Research Experiences for Undergraduates (Student perspective)

- Who: Undergraduates currently enrolled in 2 or 4-year college; U.S. citizens
- What: Undergraduate summer research internship
- Where: Both international and domestic programs
- When: Varies by program
- How: Find the list of REU sites on the NSF website; apply directly to an REU through their website or through ETAP

  Applications include: (1) personal statement, (2) transcript and (3) two recommendations

Search for an REU Site



Biology REU Sites

Export results: CSV | Excel | XML

Show 30

Showing 61 to 90 of 152 ‹ Previous 1 2 3 4 5 Next ›

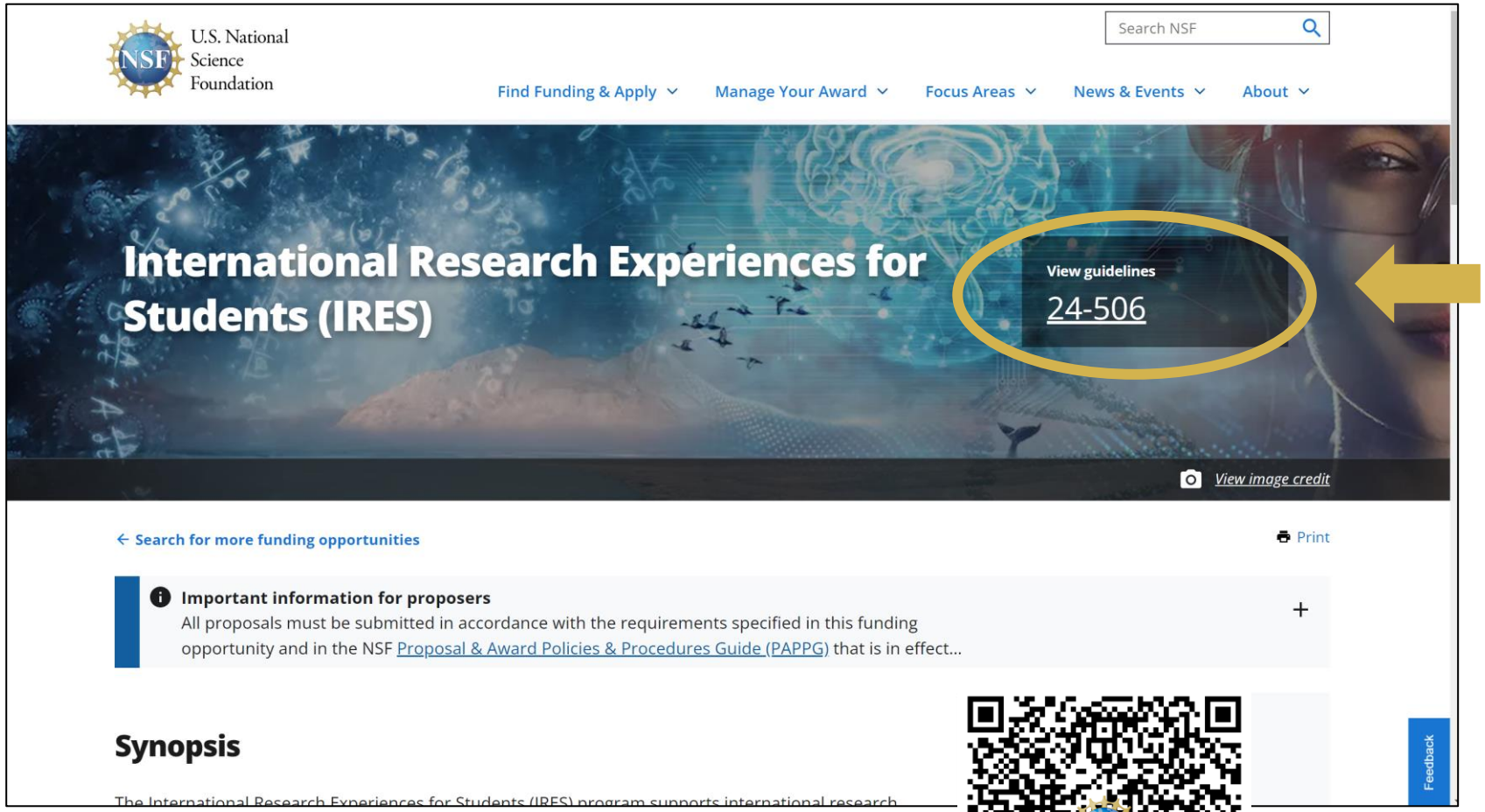
Site Information	Site Location	Contact Information	Additional Information
Northeastern University REU Site: Teamwork in Biology Inquiry: From Molecules to Organisms Biology	Boston, Massachusetts	**Primary:** Wendy Smith (617) 373-2600 w.smith@neu.edu **Secondary:** Rebeca Rosengaus (617) 373-7032 r.rosengaus@neu.edu	**Research Topics/Keywords:** Biology, interdisciplinary, development, regeneration, damage response, immunity Abstract of Award
Northern Arizona University REU Site: Ecology, Genetics, and Adaptation on the Colorado Plateau	Flagstaff, Arizona	**Primary:** Liza Holeski (928) 523-0701 liza.holeski@nau.edu **Secondary:** Ted Martinez (928) 523-3383 Theodore.Martinez@nau.edu	**Research Topics/Keywords:** Biosciences, biology, environmental science, ecology, plant science Abstract of Award
Northwestern University REU Site: Synthetic Biology at Northwestern: From Molecules to Society (SynBREU2.0) Center for Synthetic Biology	Evanston, Illinois	**Primary:** Danielle Tullman-Ercek (847) 491-7043 ercek@northwestern.edu **Secondary:** Gabriel Rocklin (312) 503-4226 grocklin@gmail.com	**Research Topics/Keywords:** biosciences, synthetic biology, bioengineering, microbiology, biochemistry, metabolic engineering, applied mathematics **Comments:** Contact synbreu@northwestern.edu for information Abstract of Award **Cofunded:** Engineering

IRES: International Research Experiences for Students

- Who: Undergraduates or graduate students who are citizens, nationals, or permanent residents of the U.S.
- What: International research opportunities involving mentoring by researchers at a foreign lab; usually involve small groups of students who travel to a host institution for a summer-length research project.
- How: To find active IRES projects, visit the NSF IRES Project Search. Each project lists the name and contact information of the Principal Investigator, or lead, of that project.

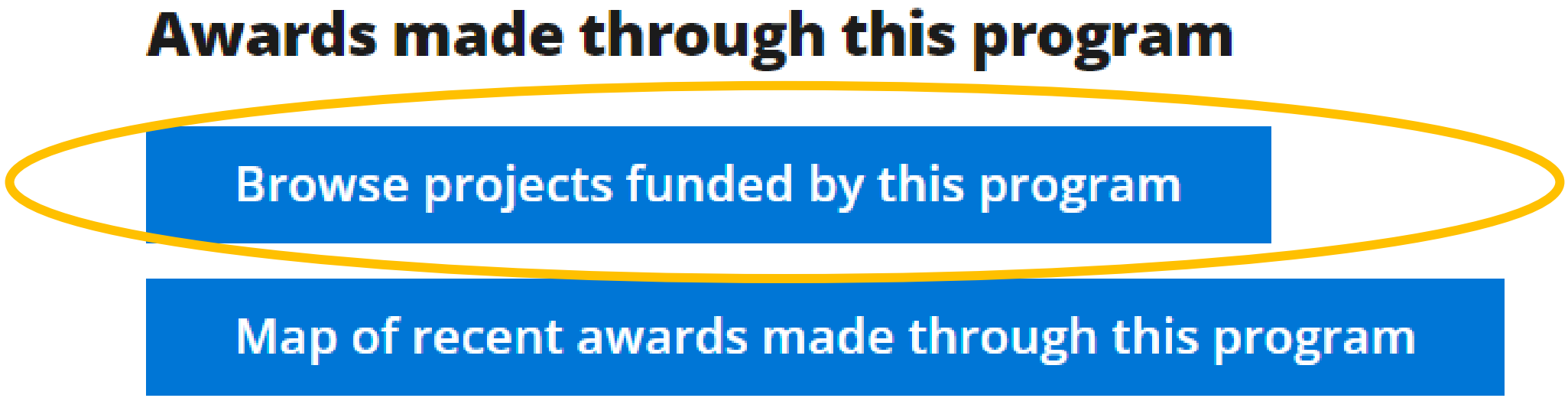
IRES: Students and Faculty

For Students Who want to Participate: Scroll Down



For Faculty who want to propose to run an IRES Program: View Guidelines

IRES Projects Funded-to-date



IRES Award Listing

IRES Track I: Exploring Adaptive Responses to Dynamic Island Environments Solomon Islands
Award Number:2025704; Principal Investigator:John Uy; Co-Principal Investigator:; Organization:University of Rochester;NSF Organization:OISE Start Date:01/01/2020; Award Amount:$211,960.00; Relevance:48.0;

IRES Track 1: US-Morocco Collaborative Research for Socially and Environmentally Sustainable Women's Argan Oil Production
Award Number:1952578; Principal Investigator:Tara Deubel; Co-Principal Investigator:; Organization:University of South Florida;NSF Organization:OISE Start Date:09/15/2020; Award Amount:$180,000.00; Relevance:48.0; Morocco

Collaborative Research: RUI: IRES - Track I: US-Australia collaboration on a new class of lead-free copper alloys to meet international health demands Australia
Award Number:2106617; Principal Investigator:Lori Bassman; Co-Principal Investigator:; Organization:Harvey Mudd College;NSF Organization:OISE Start Date:10/01/2021; Award Amount:$201,193.00; Relevance:48.0;

Collaborative Research: RUI: IRES - Track I: Brown Carbon Aerosol Formation by Photooxidation of Phenolic Compounds in Nanodroplets
Award Number:1825094; Principal Investigator:Lelia Hawkins; Co-Principal Investigator:; Organization:Harvey Mudd College;NSF Organization:OISE Start Date:11/01/2018; Award Amount:$143,328.00; Relevance:48.0; France

IRES Track I: US-Japan Collaboration on Organic Electronics Research and Education Japan
Award Number:1827020; Principal Investigator:Matthew White; Co-Principal Investigator:Severin Schneebeli, Matthew White, David Punihaole; Organization:University of Vermont & State Agricultural College;NSF Organization:OISE Start Date:09/01/2018; Award Amount:$299,161.00; Relevance:48.0;

Collaborative Research: IRES Track I: U.S.-Denmark program for advanced reliability analysis of ac/dc converters with INNOVAtive conTrols in glObe-spanning supergRid (INNOVATOR) Denmark
Award Number:2152905; Principal Investigator:Masoud Davari; Co-Principal Investigator:; Organization:Georgia Southern University Research and Service Foundation, Inc;NSF Organization:OISE Start Date:06/01/2022; Award Amount:$220,572.00; Relevance:48.0;

IRES Track 1: RUI: Monitoring of Marine Life Coastal Habitats via Autonomous Robot Systems
Award Number:1952616; Principal Investigator:Christopher Clark; Co-Principal Investigator:Christopher Lowe; Organization:Harvey Mudd College;NSF Organization:OISE Start Date:09/01/2020; Award Amount:$300,000.00; Relevance:48.0; Costa Rica

IRES Track II: Advanced Studies Institutes in Analysis on Fractal Spaces, Dynamical Systems and Mathematical Physics
Award Number:1953471; Principal Investigator:Zair Ibragimov; Co-Principal Investigator:; Organization:CSU Fullerton Auxiliary Services Corporation;NSF Organization:OISE Start Date:03/15/2020; Award Amount:$319,919.00; Relevance:48.0; Uzbekistan

Collaborative Research: IRES Track III: Bioinspired Autonomy in Natural Environments
Award Number:1954172; Principal Investigator:Rolf Mueller; Co-Principal Investigator:Bevlee Watford, Alexander Leonessa, Vinod Lohani; Organization:Virginia Polytechnic Institute and State University;NSF Organization:OISE Start Date:03/01/2020; Award Amount:$837,325.00; Relevance:48.0; Singapore

IRES track I: International Research Experience in France on Thermal Treatment of Biomass (I-CEMITURE) France
Award Number:1952402; Principal Investigator:Rafael Quirino; Co-Principal Investigator:Karelle Aiken; Organization:Georgia Southern University Research and Service Foundation, Inc;NSF Organization:OISE Start Date:09/01/2020; Award Amount:$279,827.00; Relevance:48.0;

IRES: Track I: Insights into human evolution gained from genetic, morphological, and neuroscientific analyses at the Primate Research Institute of Kyoto University, Japan Japan
Award Number:1853937; Principal Investigator:Anthony Tosi; Co-Principal Investigator:Owen Lovejoy, Mary Ann Raghanti, Richard Meindl; Organization:Kent

RaMP Research and Mentoring for Post-baccalaureates in Biology

- Networks to support full-time research, mentoring, and training for recent college graduates who have had few or no research or training opportunities during college in research fields typically supported by BIO.
- Transitions into the STEM workforce could include pathways into research-focused M.S. or Ph.D. programs, industry, federal or state agencies, education and research centers, and other STEM careers.

NSF ETAP Education & Training Application

- Easy way to discover and apply to opportunities that strengthen your academic career.
- Principal Investigators of NSF Awards can customize NSF's ETAP application to provide opportunities for applicants to participate in.
- ETAP does not include all of NSF Education and Training Opportunities available.

Opportunities to work at NSF

- Summer Scholars Internship Program
  - 10-week-long summer internship at NSF for undergraduate and graduate students.
  - Interns learn about science administration and how federal policies affect the science and engineering community.
  - Students interested in the NSF Summer Scholars Internship Program can apply through the QEM Network or Hispanic Association of Colleges and Universities National Internship Program

Other Opportunities to work at NSF

- Administrative Staff Positions including Program Assistant, Program Specialist, Program Analyst, and Science Assistant
- The Science & Technology Policy Fellowships program provides opportunities for scientists and engineers to contribute to federal policymaking while learning firsthand about the intersection of science and policy.
- The Mass Media Science & Engineering Fellowship places science students and postdoctoral trainees in newsrooms to work as reporters, editors and production assistants.

Thinking about grad school?

GRFP Graduate Research Fellowship Program

- Who: Graduate or undergraduate student pursuing Master's or PhD studies (U.S. citizen, national, or permanent resident)
- What: A 5-year year STEM fellowship (3 years of financial support)
- Where: At any U.S. Institution of Higher Education or non-profit organization
- When: Can apply as an undergraduate in their final year of study, recent graduates, and graduate students within the first 12 months of study
  - Applications due: Oct./Nov. each year
- How: To apply go to fastlane.nsf.gov/grfp

GRFP Graduate Research Fellowship Program

Three years of financial support

$37,000 / year stipend

$16,000 educational allowance

The award:

- Fellowship: Awarded to individual
- Flexible: Choice of project, advisor, and program
- Unrestricted: No service requirement
- Portable: Can be used at any accredited, non-profit, US institution of higher education, with campus in US research-based master's and doctoral degrees

Level 1: Seniors/bachelor's degree: no graduate study

Level 1 unlimited applications

Level 2: 1st-year graduate students

- Joint bachelor's-master's (completed 3 years)

Level 3: Second-year graduate students

- No more than 1 academic year completed in 1st graduate degree program
- For joint BS/MS holders ONLY, can apply as 1st year doctoral students if went directly into PhD program, after completing joint bachelor's-master's degree)

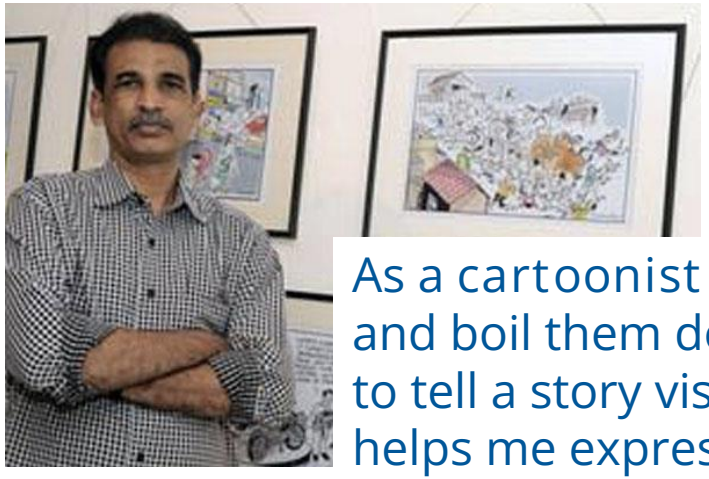
Level 2-4 Only apply once

Level 4: Returning graduate students

- > 2-year interruption in graduate study
- No doctorates or >1 academic year in graduate program
- NOT ENROLLED in graduate program at application deadline

*Amounts are based on GRFP Solicitation NSF 23-605

What Makes You Unique as a Scientists?



As a cartoonist I take complex images and boil them down to key signatures to tell a story visually without text. This helps me express complex processes through simple schematics.

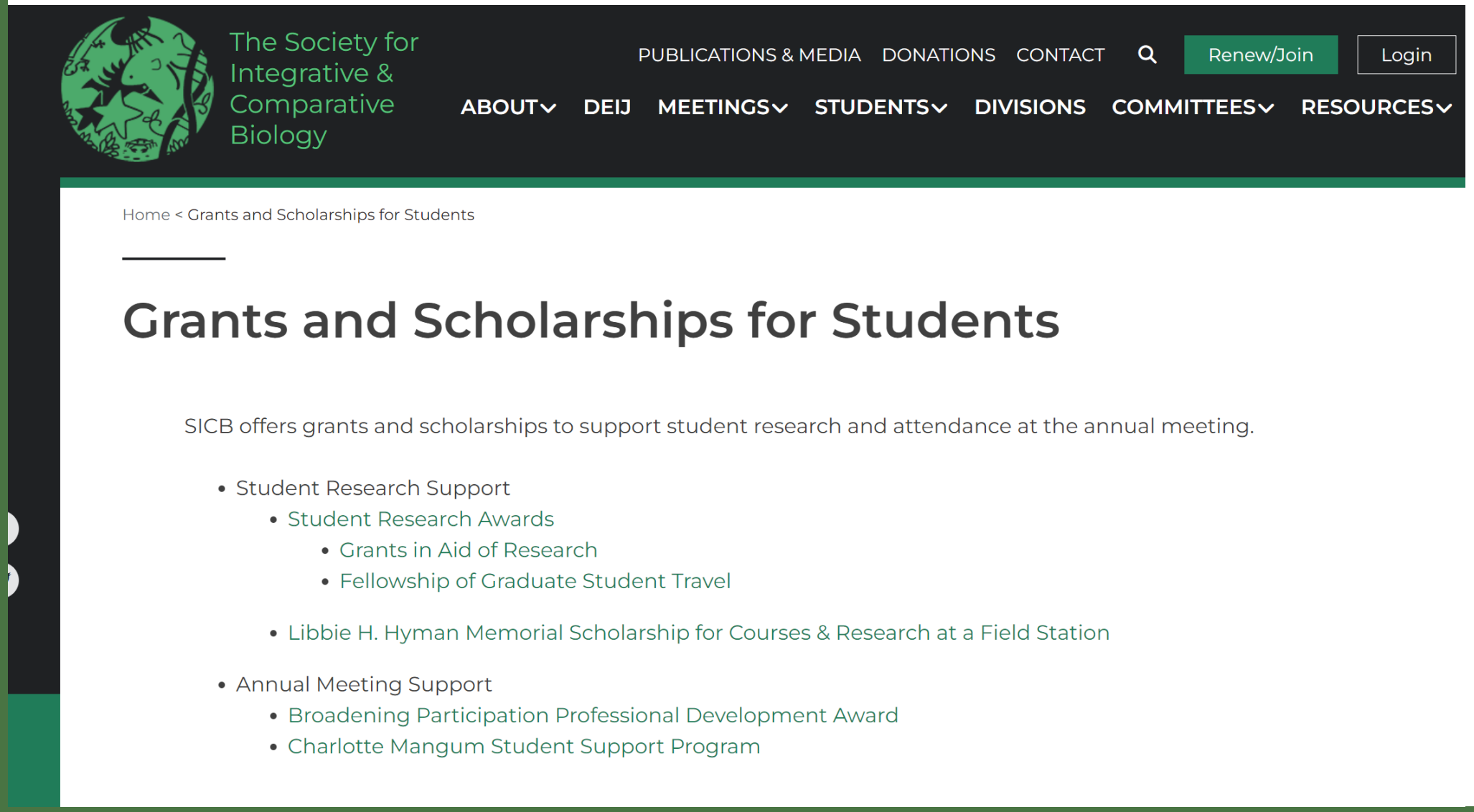
As a rock climber, you have to risk falling in order to become better; the same principle applies in science.

Woodworking has made me better at planning solutions several steps ahead

Dancing connects my body & mind in a way that challenges me to question established truths and overcome my limitations.

https://science.sciencemag.org/content/sci/361/6397/24.full.pdf

SICB Resources



INTERN Non-Academic Research Internships for Graduate Students

- Who: Graduate Students in NSF funded labs (application as a supplement to the existing award)
- What: Provides graduate students with experiential learning opportunities through research internships to acquire core professional competencies and skills to support careers in any sector of the U.S. economy.
- Where: For-profit industry laboratories, Start-up businesses, Government agencies, Museums, Policy think-tanks' Non-profit organizations
- More info: NSF 21-013 https://www.nsf.gov/pubs/2021/nsf21013/nsf21013.jsp

PRFB Postdoctoral Research Fellowship in Biology

- Who: Recent recipients of doctoral degrees (Past 15 months); US citizen or national or us permanent resident
- What: 3-year postdoctoral fellowship
- Current themes: Rules of Life, Plant Genomics, Broadening Participation
- Where: At any Institution of Higher Education or non-profit organization
- When: Application deadline is in the Fall
- Contact: bio-dbi-prfb@nsf.gov

PRFB Postdoctoral Research Fellowship in Biology

Three years of financial support
$60,000 / year Salary
$20,000 Research allowance

The award:

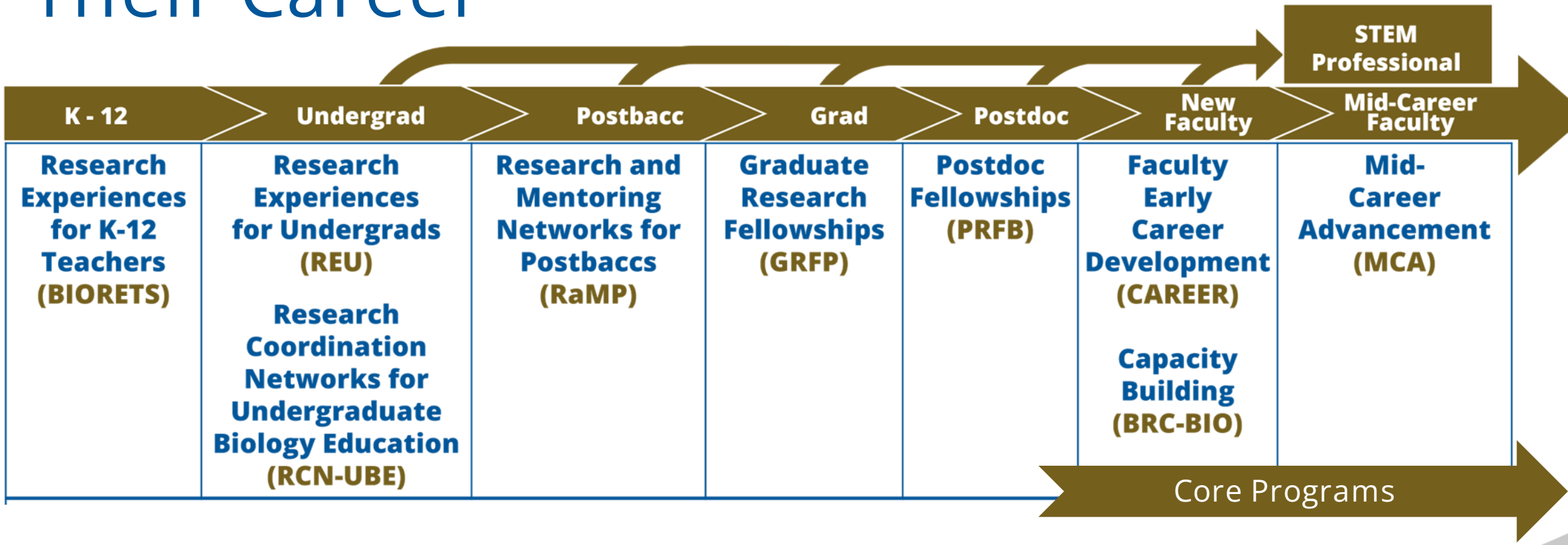
- Fellowship: Awarded to individual
- Mentoring: should provide active
- Unrestricted: No service requirement
- Portable: Can be used at any accredited, non-profit, US institution of higher education, with campus in US research-based master's and doctoral degrees

Area 1: Broadening Participation of Groups Underrepresented in Biology

Area 2: Integrative Research Investigating the Rules of Life Governing Interactions Between Genomes, Environment, and Phenotype.

Area 3: Plant Genome Postdoctoral Research Fellowships

Supporting Researchers Throughout Their Career



Core Programs

Division of Integrative and Organismal Systems
Division of Environmental Biology
Division of Molecular and Cellular Biology

- Who: Unaffiliated individuals are not eligible to submit proposals.
- What: Proposals are welcomed in all core scientific program areas supported, including projects that cross traditional disciplinary boundaries (talk to your Program Directors).
- Where: Institutions of Higher Education; Non-profit, Non-academic Organizations; Tribal Governments.
- When: Any time (in BIO)
- Amount: Create a Budget for what you need

Merit Review Criteria

- Intellectual Merit (IM):
  the potential to advance knowledge

- Broader Impacts (BI):
  the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

Broader Impacts: Benefitting Society

Teaching, training, and learning (undergrads + grad students)	Broaden participation of underrepresented groups	Build or enhance partnerships (internationally, or with other agencies)
Broad dissemination to enhance scientific + technological understanding	Enhance infrastructure (labs, equipment, + work in developing countries)	Local impacts (policies @ state + local level)

A Proposal is Different Than a Paper

A Paper is:

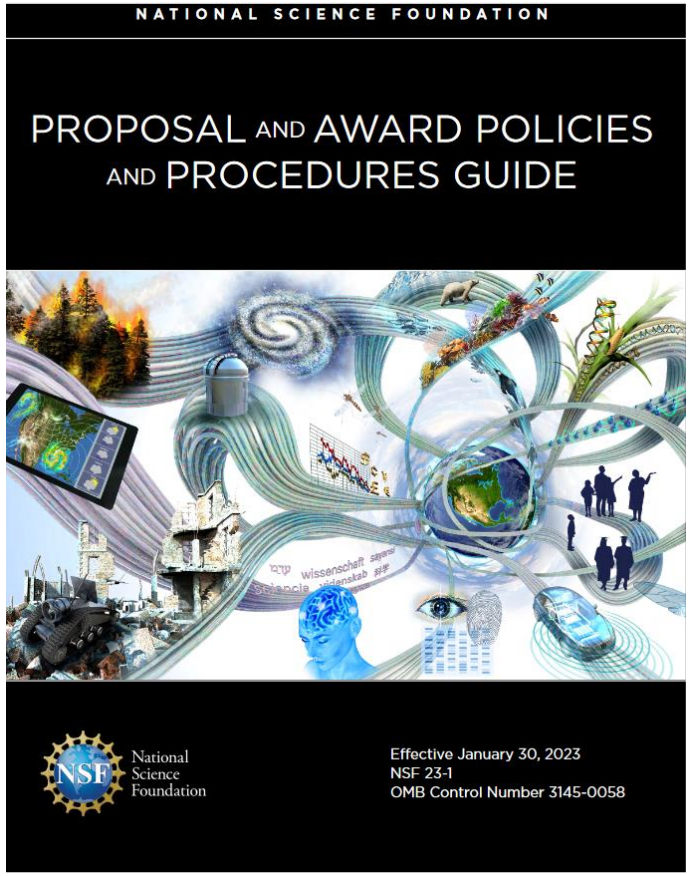
1. a scholarly pursuit: individual passion, past-oriented, work that has been done
2. theme-centered: theory and thesis
3. expository rhetoric: explaining to the reader, impersonal tone, objective, dispassionate
4. individualistic: primarily a solo activity
5. few length constraints: verbosity rewarded
6. specialized terminology: “insider jargon”

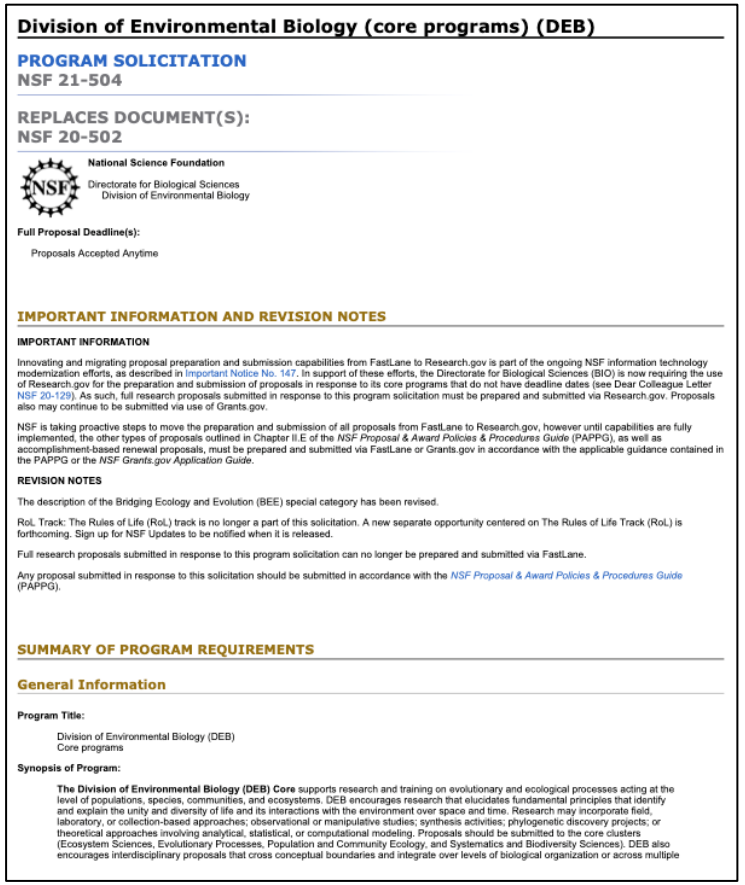
A Proposal is:

1. aimed at sponsor goals: service attitude, future-oriented, work that should be done
2. project-centered: objectives and activities
3. persuasive rhetoric: ’selling’ the reader, personal tone, conveys excitement
4. team-focused: feedback needed
5. strict length constraints: brevity rewarded
6. accessible language: easily understood

Porter (2007) The Journal of Research Administration; Volume XXXVIII, No.2: p. 37-43

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 II.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:

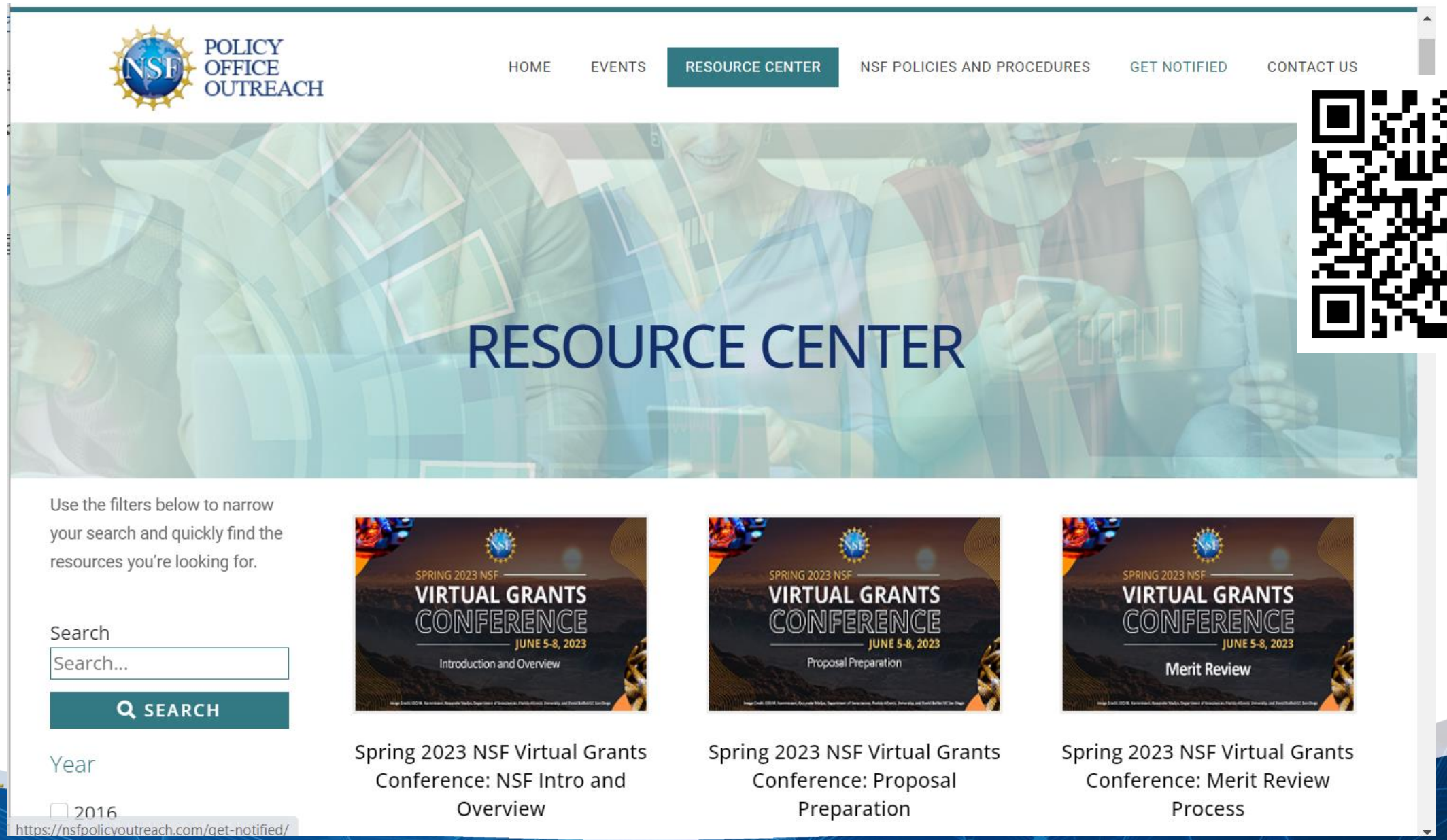
Division of Environmental Biology (DEB)
Core programs

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 + Solicitation

NSF Policy Office Outreach



BIO Outreach and Blogs

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.

BIO Blogs

News, features, highlights, 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/

SCIENCE HAPPENS HERE

Share your story!

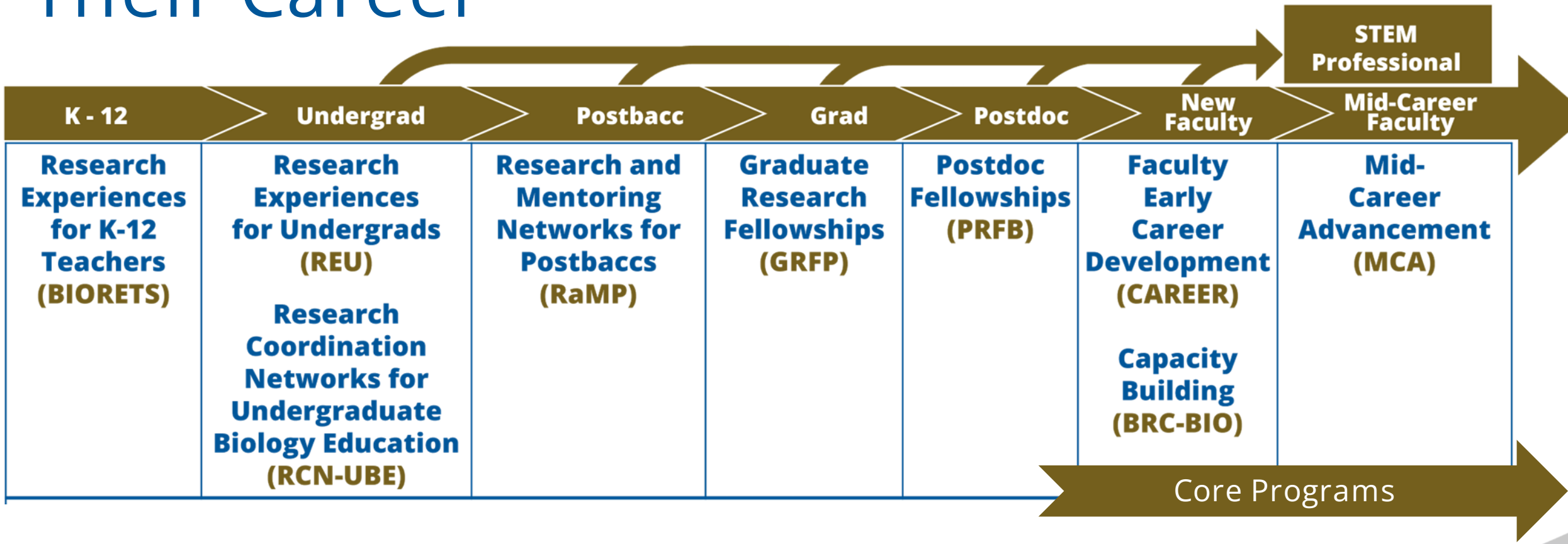
#NSFstories

Join NSF in highlighting your amazing research, discoveries, innovation and more happening across the country and around the world.

- ☑ Tag your location and use our IG filter, graphics or simply post a photo or video with #NSFstories
- ☑ We will amplify your posts and share your stories. We will also share your stories at events, hold competitions, feature on our blog and more!

Toolkit: nsf.gov/ScienceHappensHere

Supporting Researchers Throughout Their Career



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Sign ups available for individual meetings with NSF staff.

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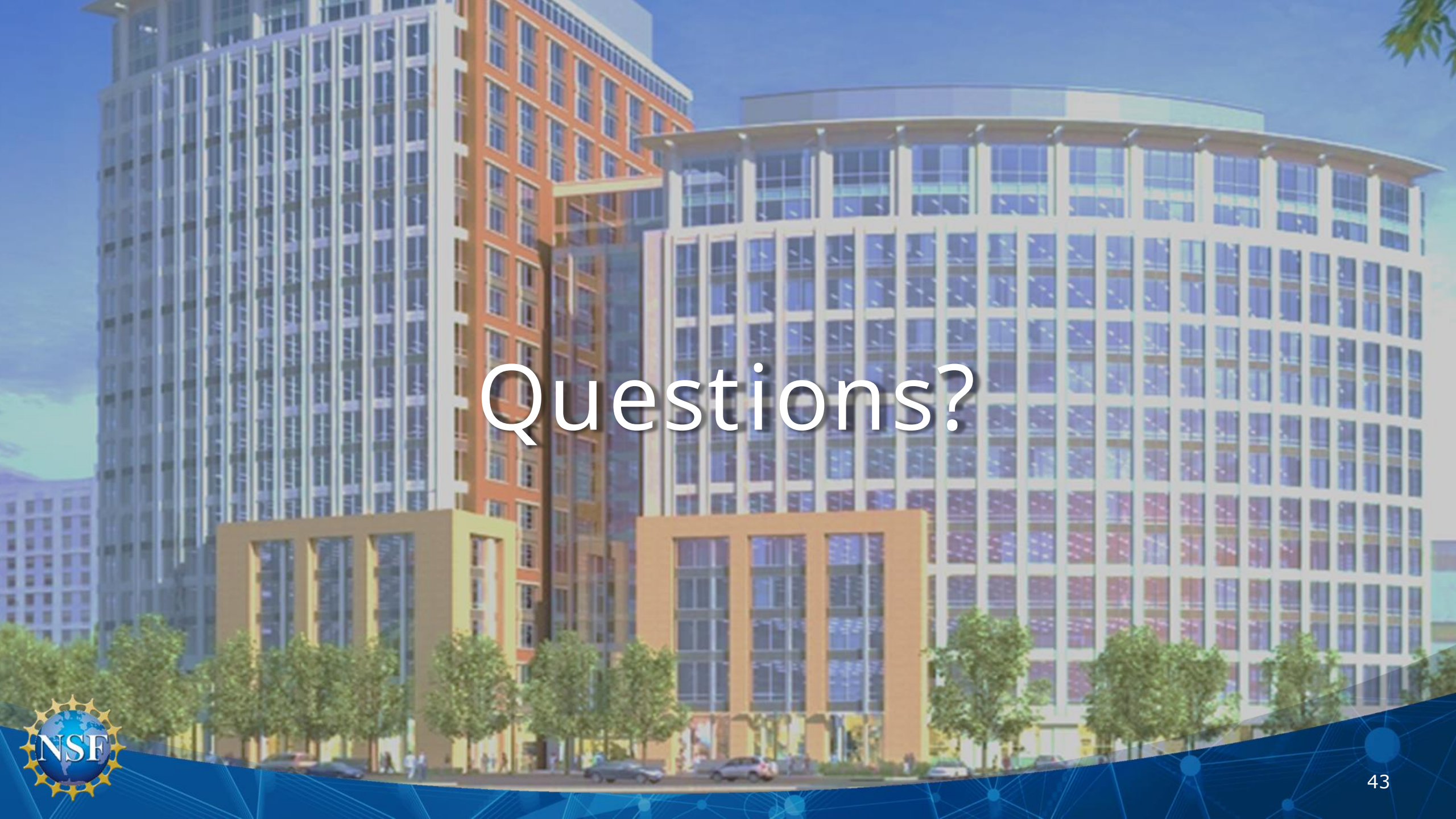
Questions?