Funding opportunities in the Directorate for Biological Sciences and Directorate for Geological Sciences

Scott V. Edwards, Division Director
Division of Biological Infrastructure

Lina C. Patino, Program Director
Division of Earth Sciences

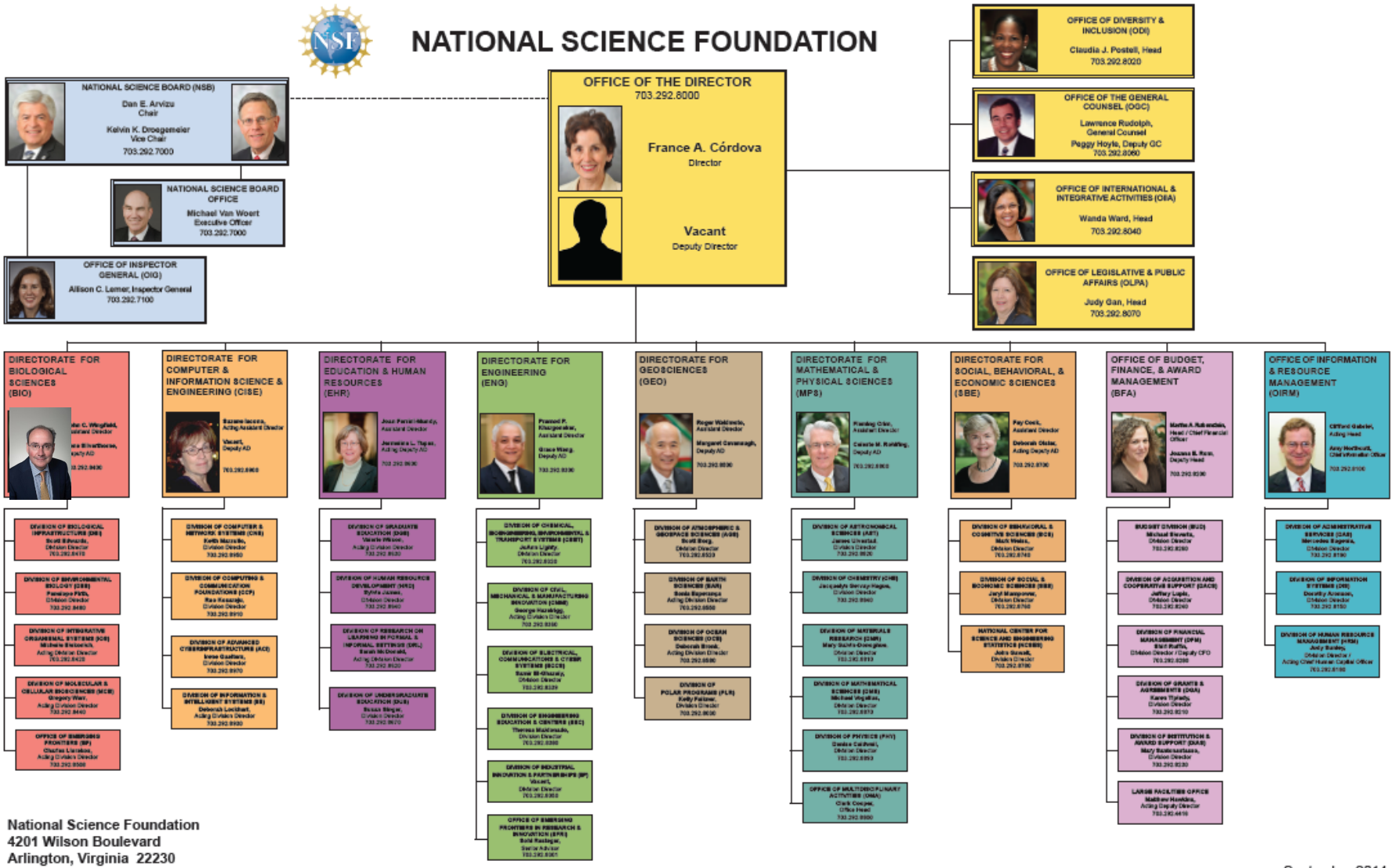
HBCU UP / CREST PI MEETING
Washington DC
February 19, 2015

NSF Overview

- Supports basic research and education
- Low overhead; highly automated
- Discipline-based structure
- Cross-disciplinary mechanisms
- Use of rotators and IPAs

- Annual budget ~$7 billion; >42,000 proposals; ~10,000 new awards per year supporting ~200,000 scientists, engineers, educators and students

NSF Organization - 2014



National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230
TEL: 703.292.5111 | FIRS: 800.877.8339 | TDD: 800.281.8749

NSF Merit Review

- NSF Review Criteria
  - Intellectual Merit
  - Broader Impacts

- Programs can also have additional review criteria – read the Program Solicitation!

- Merit Review is conducted through ad hoc peer review and/or panel review

HBCU UP / CREST PI MEETING
Washington DC
February 19, 2015

NSF Directorate for Geosciences

Lina C. Patino

Division of Earth Sciences

lpatino@nsf.gov

Fiscal Year 2015 Budget Request

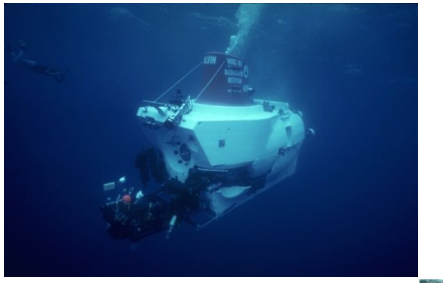
R&RA Funding
(Dollars in Millions)

	FY 2013 Actual	FY 2014 Estimate	FY 2015 Request	Change over FY 2014 Estimate Amount	Change over FY 2014 Estimate Percent
Biological Sciences	$679.21	$721.27	$708.52	-$12.75	-1.8%
Computer & Information Science & Engineering	858.13	894.00	893.35	-0.65	-0.1%
Engineering	820.18	851.07	858.17	7.10	0.8%
Geosciences	1,273.77	1,303.03	1,304.39	1.36	0.1%
Mathematical & Physical Sciences	1,249.34	1,299.80	1,295.56	-4.24	-0.3%
Social, Behavioral & Economic Sciences	242.62	256.85	272.20	15.35	6.0%
International and Integrative Activities	434.28	481.59	473.86	-7.73	-1.6%
U.S. Arctic Research Commission	1.39	1.30	1.41	0.11	8.1%
Total, R&RA	**$5,558.88**	**$5,808.92**	**$5,807.46**	**-$1.46**	**-**

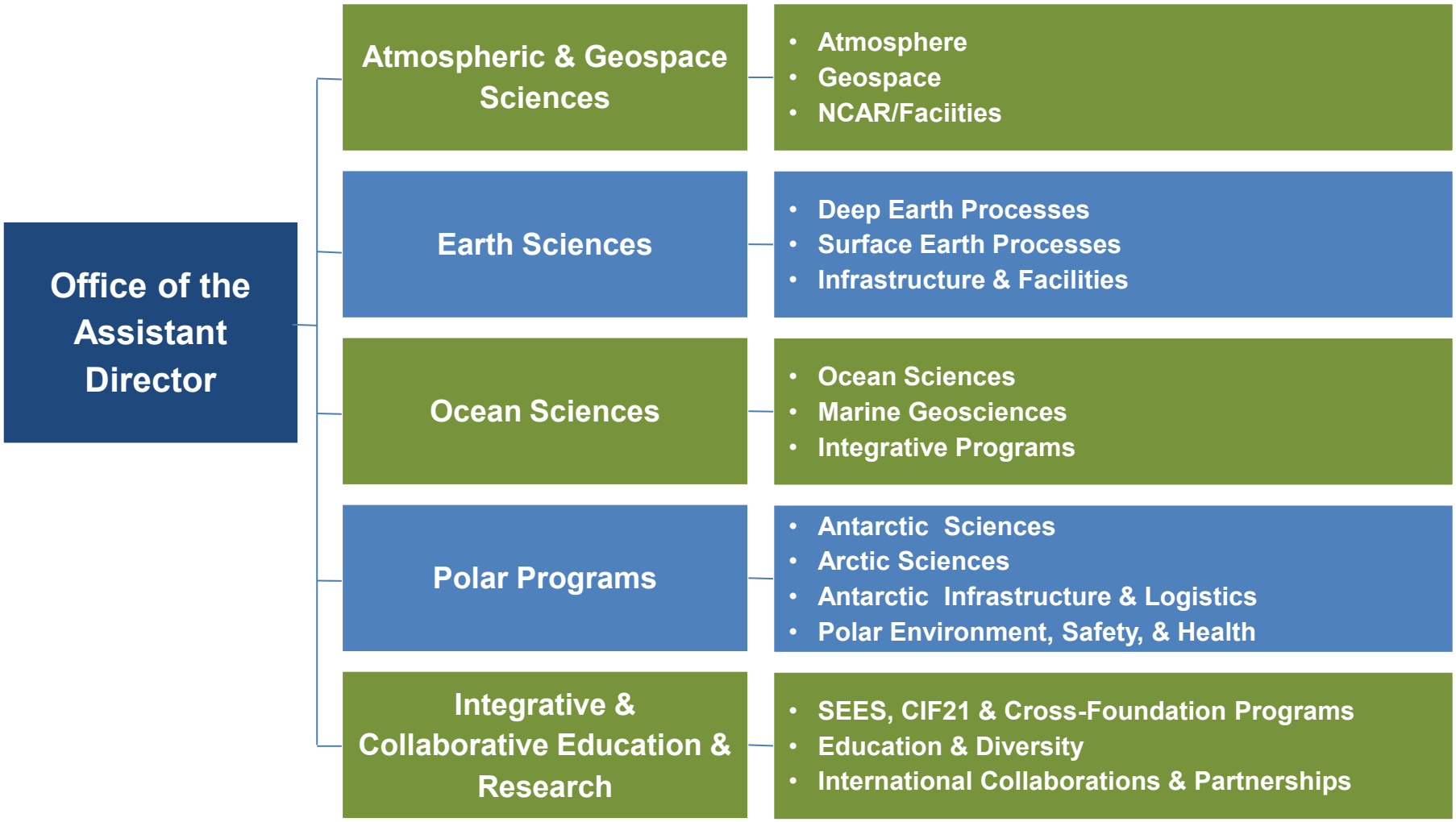
Totals may not add due to rounding.

Directorate for Geosciences: Our Mission

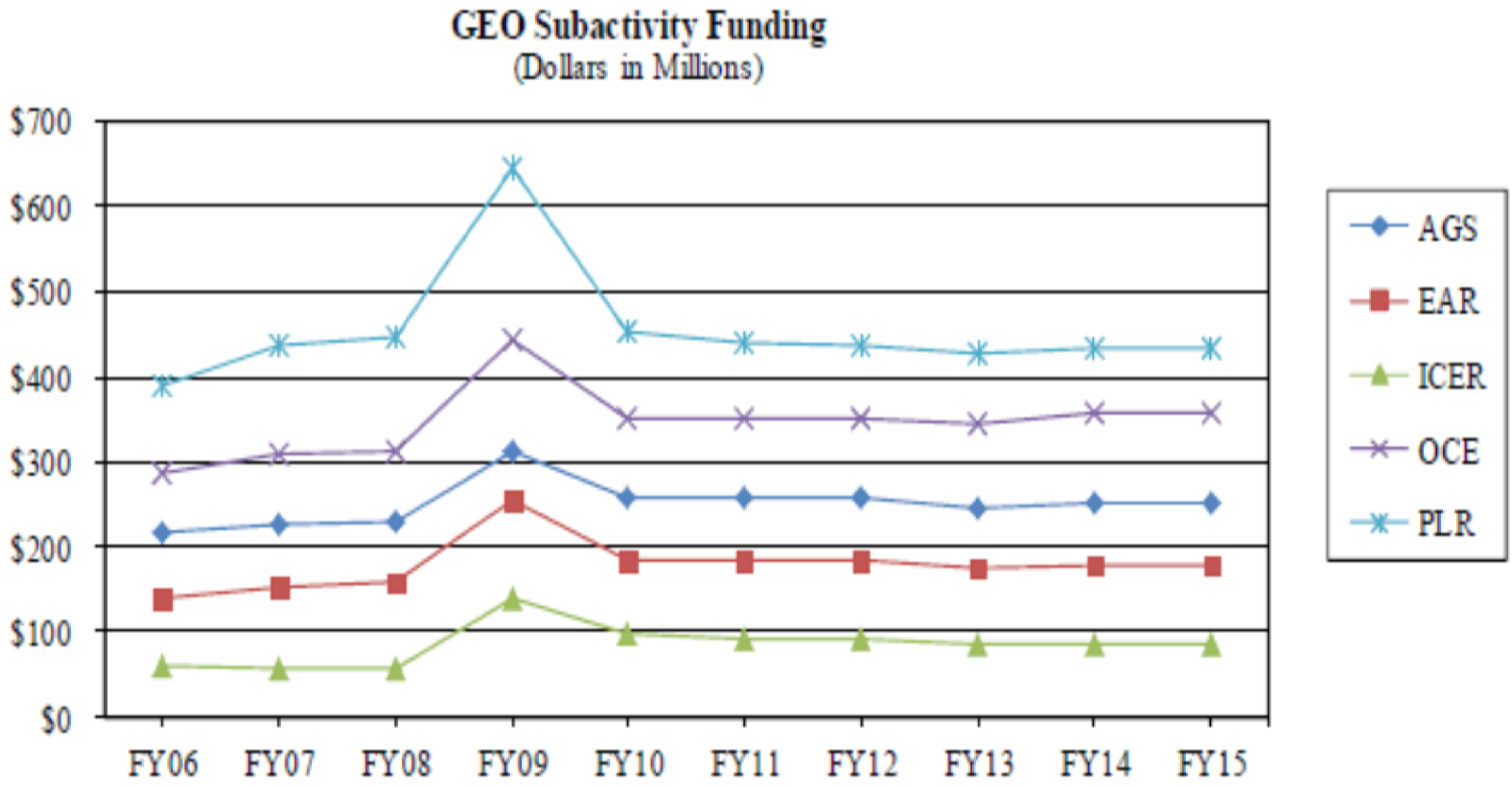
- Support research in atmospheric, earth, polar and ocean sciences
- Address the Nation's need to understand, predict and respond to environmental events and changes in order to use the Earth's resources wisely



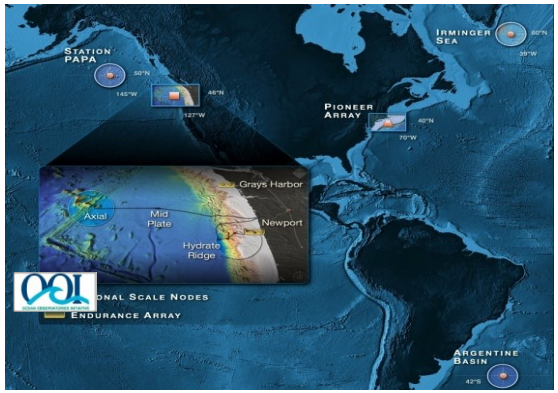
GEO Profile


Office of the Assistant Director
Atmospheric & Geospace Sciences
• Atmosphere
• Geospace
• NCAR/Faciities
Earth Sciences
• Deep Earth Processes
• Surface Earth Processes
• Infrastructure & Facilities
Ocean Sciences
• Ocean Sciences
• Marine Geosciences
• Integrative Programs
Polar Programs
• Antarctic Sciences
• Arctic Sciences
• Antarctic Infrastructure & Logistics
• Polar Environment, Safety, & Health
Integrative & Collaborative Education & Research
• SEES, CIF21 & Cross-Foundation Programs
• Education & Diversity
• International Collaborations & Partnerships

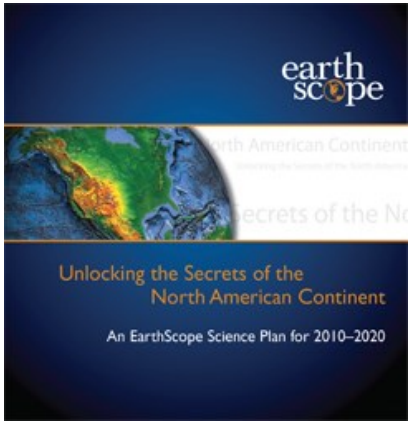
GEO Funding Trend



Arctic Sea Ice

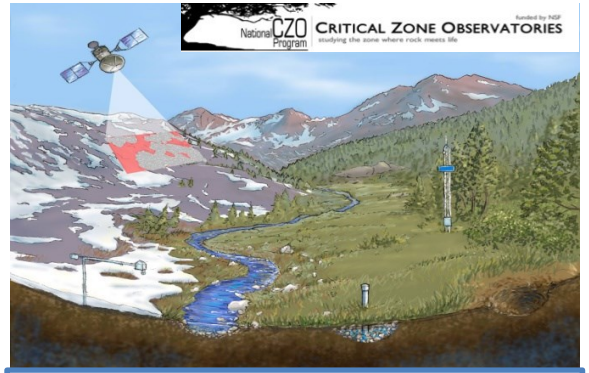


Oceans

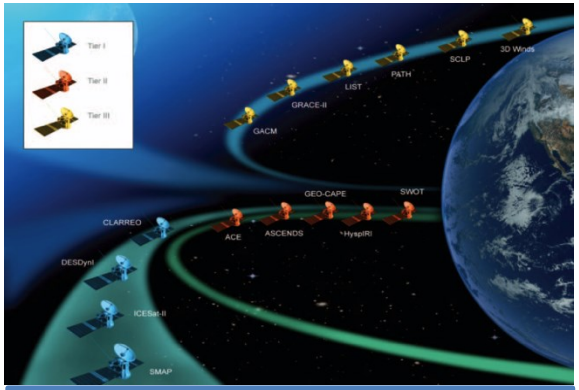


EarthScope Observatory

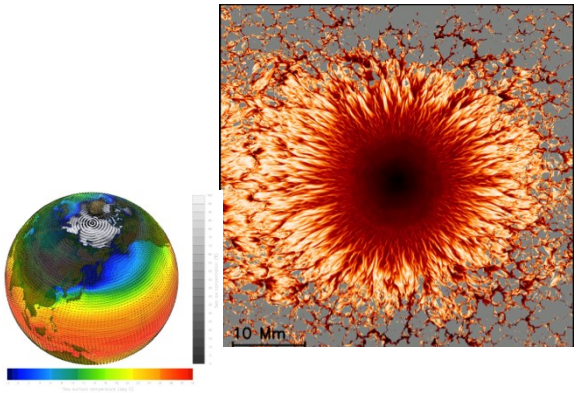
Era of Observation and Simulation



Water



Satellites



Earth System Modeling

GEO Modes of support

- Unsolicited proposals from all scientists with interests in the geosciences
- Special competitions, often interdisciplinary
- Integration of research and education in geosciences
- Support for infrastructure, instrumentation, facilities
- Post-doctoral fellowship programs and workforce development programs

NSF-wide Cross-cutting Programs

- Faculty Early Career Program (**CAREER**)*
- Research in Undergraduate Institutions (**RUI**)
- Research Experiences for Undergraduates (**REU**)*
- Early Concept Grants for Exploratory Research (**EAGER**) *
- Grants for Rapid Response Research (**RAPID**) *

*contact Program Director before submitting

GEO Education and Diversity

NSF 15-526 Improving Undergraduate STEM Education: Pathways into Geoscience (IUSE: GEOPATHS)

Letter of Intent Due Date(s) (required) (due by 5 p.m. proposer's local time):

August 14, 2015

Full Proposal Submission Deadline

October 05, 2015

Primary goal: to increase the number of undergraduate students interested in pursuing undergraduate degrees and/or post-graduate degrees in geoscience

Two funding Tracks:

(1) Engaging students in the geosciences through extra- curricular experiences and training activities (GEOPATHS-EXTRA), and

(2) Improving pathways into the geosciences through institutional collaborations and transfer (GEOPATHS-IMPACT).

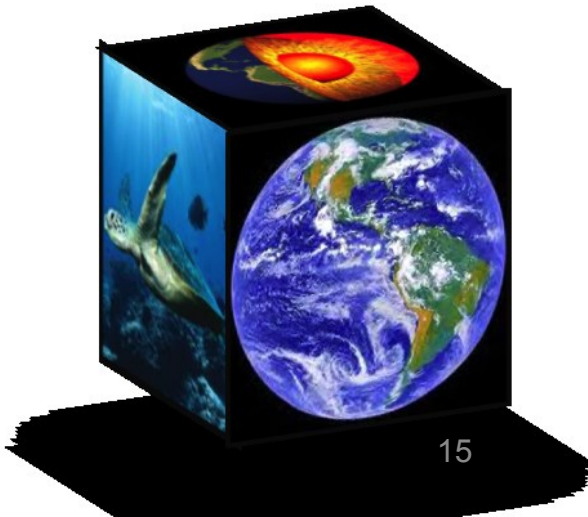
GEO Instrumentation & Facilities - Access

- GEO observing, analytical and supercomputing facilities are available to NSF PIs, students, and sometimes researchers funded by other sources.
- Each facility has its own application and review process.
- Users range from individual PIs and students to large international field campaigns.
- E.g. NCAR supercomputers, aircraft, radar; UNOLS fleet, Arctic and Antarctic logistic programs

EarthCube

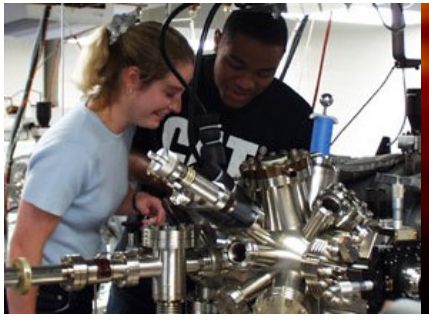
- In partnership with CISE, EarthCube creates an integrated data management infrastructure across the geosciences
- Workshops and community events to broaden user base and scientific breadth
- Coordination and community governance
- Part of NSF-wide CI thrust ('CIF21')

www.earthcube.org



Funding opportunities in the Directorate for Biological Sciences, NSF

Scott V. Edwards
Division Director
Division of Biological Infrastructure
National Science Foundation





James Olds
Asst. Director BIO

Directorate for Biological Sciences (BIO)

Emerging Frontiers (EF)

Division of Biological Infrastructure (DBI)

- Human Resources
- Research Resources

Division of Environmental Biology (DEB)

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

Division of Integrative Organismal Systems (IOS)

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

Division of Molecular and Cellular Biosciences (MCB)

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

Divisions

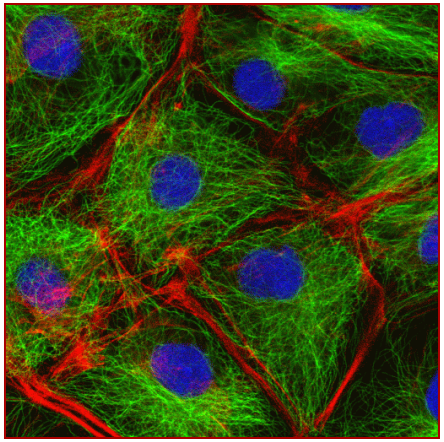
Clusters

Geo

Division of Molecular and Cellular Biosciences (MCB)

Research aimed at understanding life processes at the molecular, subcellular and cellular levels

- Cellular biology and biochemistry
- Molecular genetics and genomics
- Molecular biophysics
- Networks and regulation
- System and synthetic biology



Division of Environmental Biology (DEB)

Supports fundamental research on populations, species, communities, and ecosystems.

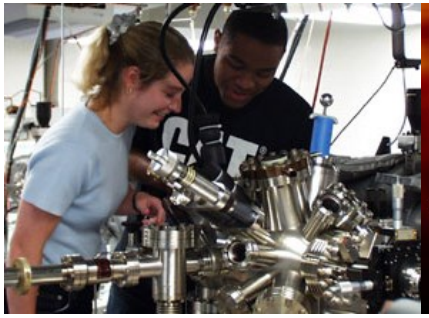
- Biodiversity, phylogenetic systematics
- Molecular evolution, life history evolution, natural selection
- Ecology, biogeography
- Ecosystem services, global change, biogeochemical cycles

Division of Integrative Organismal Systems (IOS)

Research aimed at understanding the individual organism -- plant, animal, microbe -- as a unit of biological organization

- Behavior
- Development
- Neurobiology
- Physiology
- Structure & Function

Division of Biological Infrastructure (DBI)



Division of Biological Infrastructure (DBI)

Human Resources Cluster

- Research Coordination Networks (RCN-UBE)
- Postdoctoral Research Fellowships in Biology
- Research Experiences for Undergraduates (REU)

Research Resources Cluster

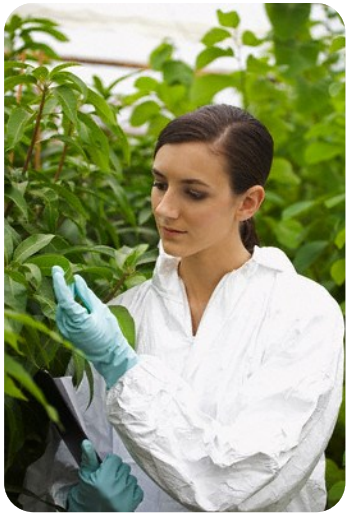
- Advances in Biological Informatics (ABI)
- Collections in Support of Biological Research (CSBR)
- Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Labs (FSML)
- Instrument Development for Biological Research (IDBR)

Centers

- NESCent, NIMBIOS, STCs (BEACON), etc.

REU Site: Research Experience for Undergraduates

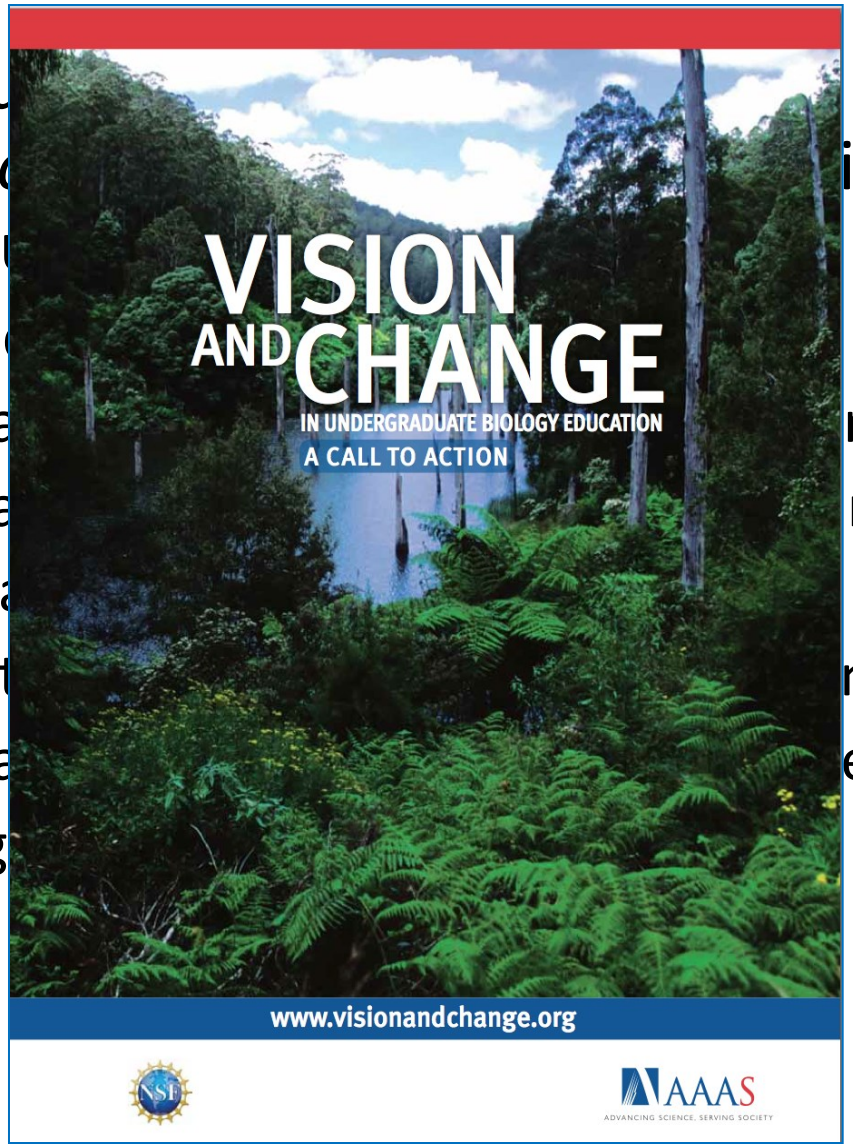
- **NSF-funded programs run by institutions**
- **NSF-wide: all disciplines including cross-disciplinary**
- **Typical program: 10-weeks; 10 students; summer**
- **Main focus: research plus orientation, lab prep, workshops, seminars, presentations, etc**



- **Initiated in 1987 to attract and retain talented undergraduates in science and engineering careers**
- **Strategy is to enhance the educational experience through active research participation**
- **REU projects are strongly encouraged to involve students from underrepresented minority groups**

Research Coordination Networks in Undergraduate Biology Education (RCN-UBE)

- Goal: "focu to *improved participati* in undergradu
  - active an
  - engage fa nt
  - incorpora rriculum
  - improve a
  - improve t nstitutions
  - Incorpora es into underg



Division of Undergraduate Education

Improving Undergraduate STEM Education

CONTACTS

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Katherine J. Denniston	kdennist@nsf.gov	(703) 292-8496	
Don L. Millard	dmillard@nsf.gov	(703) 292-4620	

For specific disciplinary questions proposers are encouraged to contact a Program Officer in their discipline.

Biological Sciences

- Kathleen Bergin, Program Director, telephone: (703)292-5171, email: kbergin@nsf.gov
- Kate Denniston, Program Director, telephone: (703)292-8496, email: kdennist@nsf.gov
- Greg Goins, Program Director, telephone: (703)292-4618, email: ggoins@nsf.gov
- Joan Prival, Program Director, telephone: (703)292-4635, email: jprival@nsf.gov
- Terry Woodin, Program Director, telephone: (703)292-4657, email: twoodin@nsf.gov

Directorate for Biological Sciences

Postdoctoral fellowships in Biology - 2015

Sophie George
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Carter Kimsey
bio-dbi-prfb@nsf.gov, (703) 292-8470

Diane Jofuku Okamuro
dbipgr@nsf.gov, (703) 292-4400

DUE DATES

Full Proposal Deadline Date: January 8, 2015

SYNOPSIS

The Directorate for Biological Sciences (BIO) awards Postdoctoral Research Fellowships in Biology to recent recipients of the doctoral degree for research and training in *selected* areas supported by BIO and with special goals for human resource development in biology. The fellowships encourage independence at an early stage of the research career to permit Fellows to pursue their research and training goals in the most appropriate research locations regardless of the availability of funding for the Fellows at that site. For FY 2015 and beyond, these BIO programs are ***(1) Broadening Participation of Groups Under-represented in Biology, (2) Research Using Biological Collections, and (3) National Plant Genome Initiative (NPGI) Postdoctoral Research Fellowships.*** These areas change periodically as new scientific and infrastructure opportunities present themselves. For this reason, this solicitation will be changed as necessary to reflect the areas being funded.

The fellowships are also designed to provide active mentoring of the Fellows by the sponsoring scientists who will benefit from having these talented young scientists in their research groups. The research and training plan of each fellowship must address important scientific questions within the scope of the BIO Directorate and the specific guidelines in this fellowship program solicitation. Because the fellowships are offered to postdoctoral scientists only early in their careers, NSF encourages doctoral advisors to discuss the availability of these postdoctoral fellowships in biology with their graduate students early in their doctoral programs to ensure potential applicants may take advantage of this funding opportunity. Fellowships are awards to individuals, not institutions, and are administered by the Fellows.

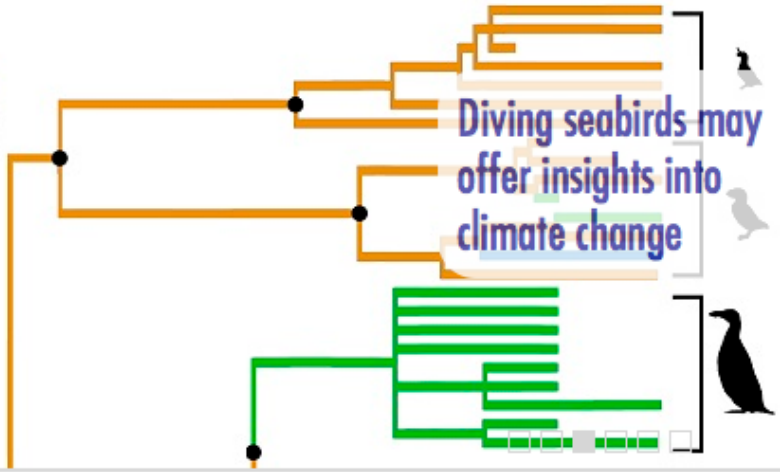
National Evolutionary Synthesis Center (NESCent)

search NESCent site GO

about people news contact donate

WELCOME

WE ARE ADDRESSING FUNDAMENTAL CHALLENGES IN EVOLUTIONARY SCIENCE

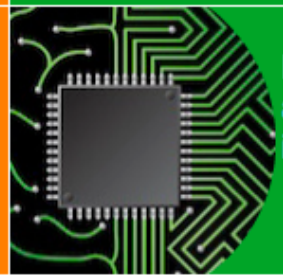


SCIENCE

Transforming evolutionary science

FIND OUT MORE

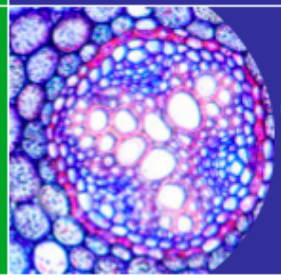
INFORMATICS



Removing barriers to accessing, sharing, and interpreting data

FIND OUT MORE

EDUCATION & OUTREACH



Connecting people with evolutionary research

FIND OUT MORE

National Institute for Mathematical Biological Synthesis

BEACON STC:
Evolution in Action

BEACON Researchers at Work: Evolving ways to switch genes on and off

Posted on February 2, 2015 by Danielle Whittaker

This week's BEACON Researchers at Work blog post is by MSU graduate student Kurtulus Kok.

> *"In considering the Origin of Species, it is quite conceivable that a naturalist...might come to the conclusion that each species...had descended, like varieties, from other species. Nevertheless, such a conclusion, even if well founded, would be unsatisfactory, until it could be shown how the innumerable species inhabiting this world have been modified, so as to acquire that perfection of structure and coadaptation which most justly excites our admiration." – Charles Darwin,* Origin of Species, *1859*

At least since the appearance of Darwin's seminal work, biologists have speculated on the sources of biological variation, and many current studies have pointed to the importance of variation in gene expression as a foundational principle. Exactly what changes at a molecular level is a topic of lively interest, with important ramifications for human health. My studies of the Hairy protein, a transcriptional repressor from the fruit fly *Drosophila*,

What's new at BEACON?

- Now accepting applications for the BEACON Distinguished Postdoctoral Fellowship
- New issue of the BEACON Buzz available!
- Postdoc position offered on the Avida-ED digital evolution education project
- MSU announces search for John R. Koza Endowed Chair in Genetic Programming

BEACON is a consortium of

- Michigan State University
- North Carolina A&T State University
- University of Idaho
- University of Texas at Austin
- University of Washington

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Advances in Biological Informatics (ABI)

ABI funds research in methods and development of tools for capture, management, and analysis of digital biological information.

Protein structure

Analysis methods

Virtual communities

Software

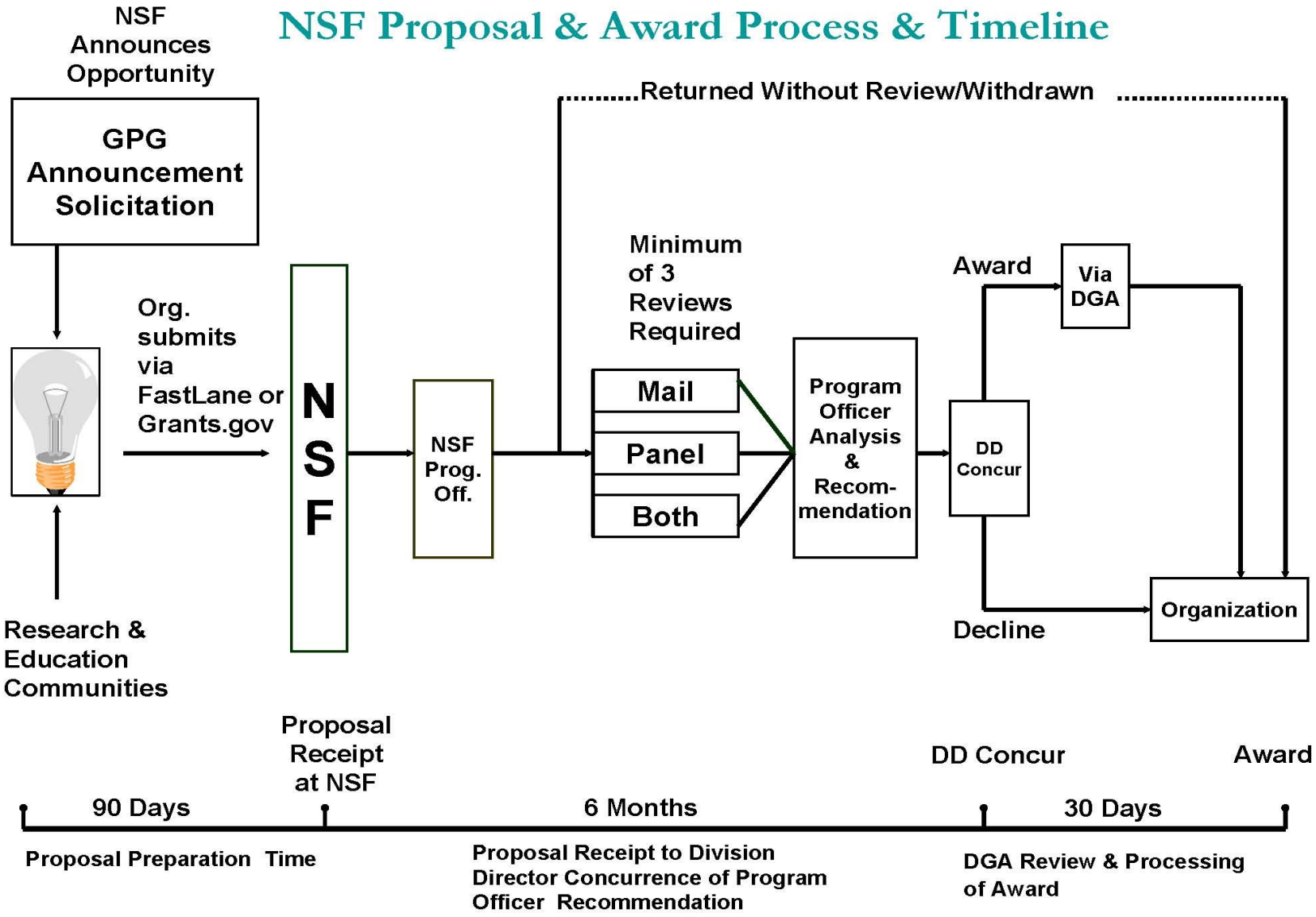
Databases

Neurobiology

Bioinformatics

RNA biology

NSF Proposal & Award Process & Timeline



*Logistics and International Engagement is handled as appropriate by each division

NSF Merit Review

- NSF Review Criteria
  - Intellectual Merit
  - Broader Impacts

- Programs can also have additional review criteria – read the Program Solicitation!

- Merit Review is conducted through ad hoc peer review and/or panel review

Which Program?

- **www.nsf.gov**
- **Read the funding opportunity** (program descriptions, solicitations) carefully, and ask a Program Officer for clarifications if needed
- **Learn the culture**- each Division/solicitation is different
- Look at what has been funded:

  Award Abstracts at *http://www.nsf.gov/awardsearch*

Some reasons we decline proposals

Poor fit to program

No clear statement of the research question(s) / hypothesis

Unlikely to result in theoretical advances

Duplicates existing work

Missing relevant literature in …

Design does not address research question(s)

Methodology is not clear / important details are missing

Team lacks expertise in …

Tool development, not research

Driven by agenda, not scientific enquiry

Proposal is poorly written / is confusing / has errors / is hard to navigate

Proposal is not compliant

Your Proposal

- Consider your audience
- **Know and follow** the ***current*** Grant Proposal Guide (GPG) AND the **solicitation-specific requirements** – ALL of them
- **Separately** address Intellectual Merit and Broader Impacts in both the Project Summary and Project Description.
- Match **and justify** the budget to the scope of the proposed work - ask for what you need.
- Don't submit your proposal at the last minute
- Download your completed proposal back to you to check it's what you sent