"NSF 101"

W. Lance Haworth
Director, NSF Office of Integrative Activities
National Science Foundation

Idaho State University, 29 September 2010

National Science Foundation

An independent federal agency that supports fundamental research and education across all fields of science and engineering, with an annual budget of almost $7 billion

NSF funds reach all 50 states through grants to over 1,700 universities and institutions

Each year, NSF receives over 40,000 competitive requests for funding, and makes over 11,000 new funding awards

The NSF Vision

Advancing discovery, innovation and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering

NSF invests in the best ideas from the most capable people, determined by competitive merit review

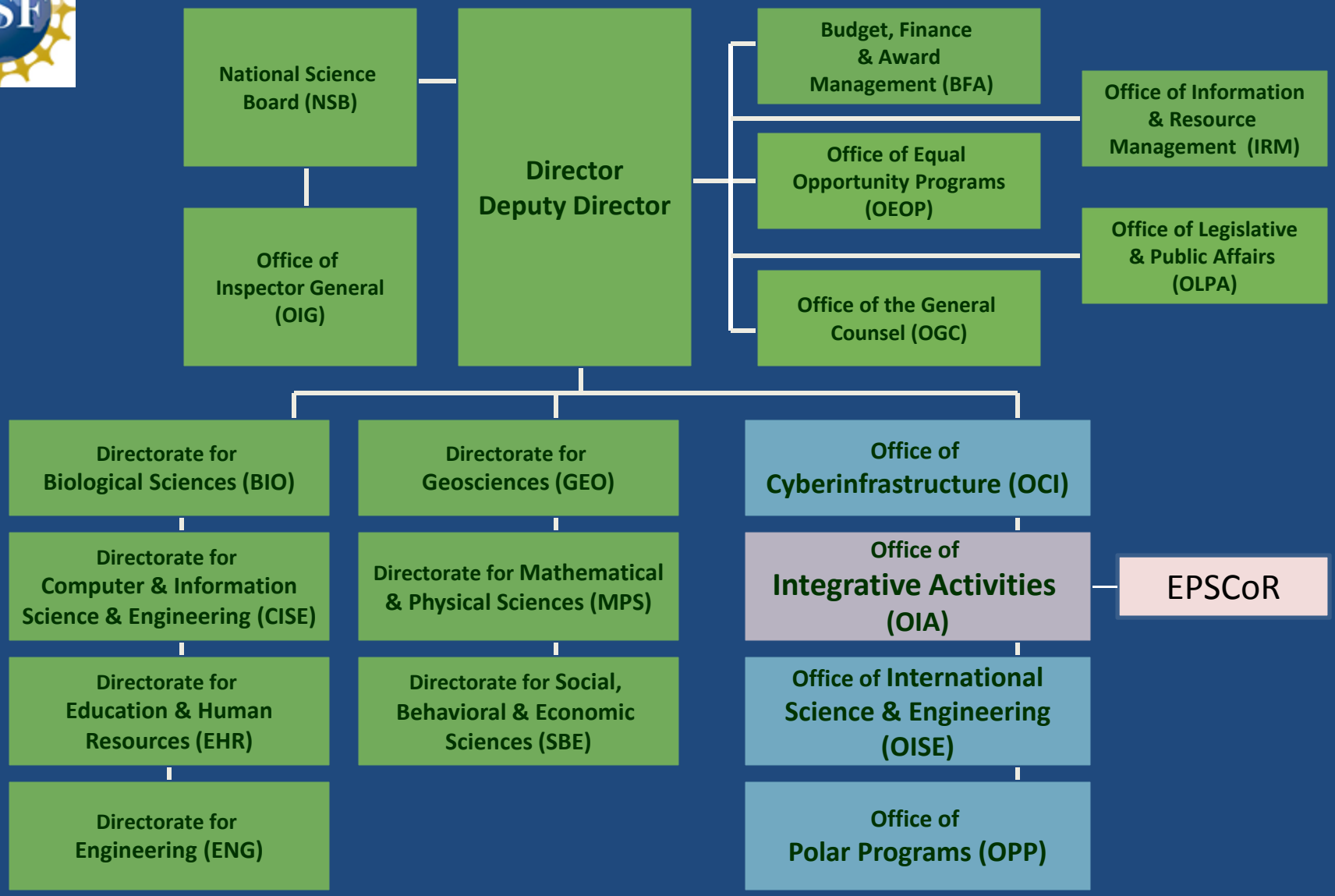
Merit Review Criteria

- *Intellectual merit* **How good is this stuff?**
  - *Is it likely to produce new knowledge?*
  - *Does it suggests and explore creative, original, or potentially transformative concepts?*
- *Broader Impacts* **So what? Who cares?**
  - *e.g. -- on education, diversity, benefit to society, future workforce, infrastructure, dissemination, impact on other areas of science and engineering…*

Myths about NSF

- Only funds scholars at elite graduate institutions
- Only funds “famous” academics
- Once declined, you will always be declined
- Won’t fund risky science
- Advisory committees make funding decisions
- You have to get “straight excellents”

NSF Organization



From the NSF Strategic Plan

Discovery increasingly requires the expertise of individuals with different perspectives – from different disciplines and often from different nations -- working together to accommodate the extraordinary complexity of today's science and engineering challenges

The convergence of disciplines and the cross-fertilization that characterizes contemporary science and engineering have made collaboration a centerpiece of the science and engineering enterprise

OIA Programs and Activities

http://nsf.gov/od/oia/

- Major Research Instrumentation
- Academic Research Infrastructure
- Science and Technology Centers
- Support for (e.g.)
  - Committee on Equal Opportunity in Science & Engineering
  - Waterman Award & National Medal of Science
  - Summer Internships & AAAS Fellowships
  - Cyber-enabled Discovery and Innovation (CDI)
- EPSCoR

Developing STEM Talent

- AAAS Fellows
  - Provide newly minted PhDs, post-docs and mid-career scientists and engineers an opportunity to learn about science policy
- NSF Summer Scholars
  - Develop undergraduate and graduate student potential - exposure to relevant science and engineering policy, research and education issues and programs
  - Encourage students to earn graduate degrees and pursue careers in STEM

Contact: Sherrie Green
sbgreen@nsf.gov

“Research grants: the nightmare before funding”

Nature ***437*** , 15 September 2005

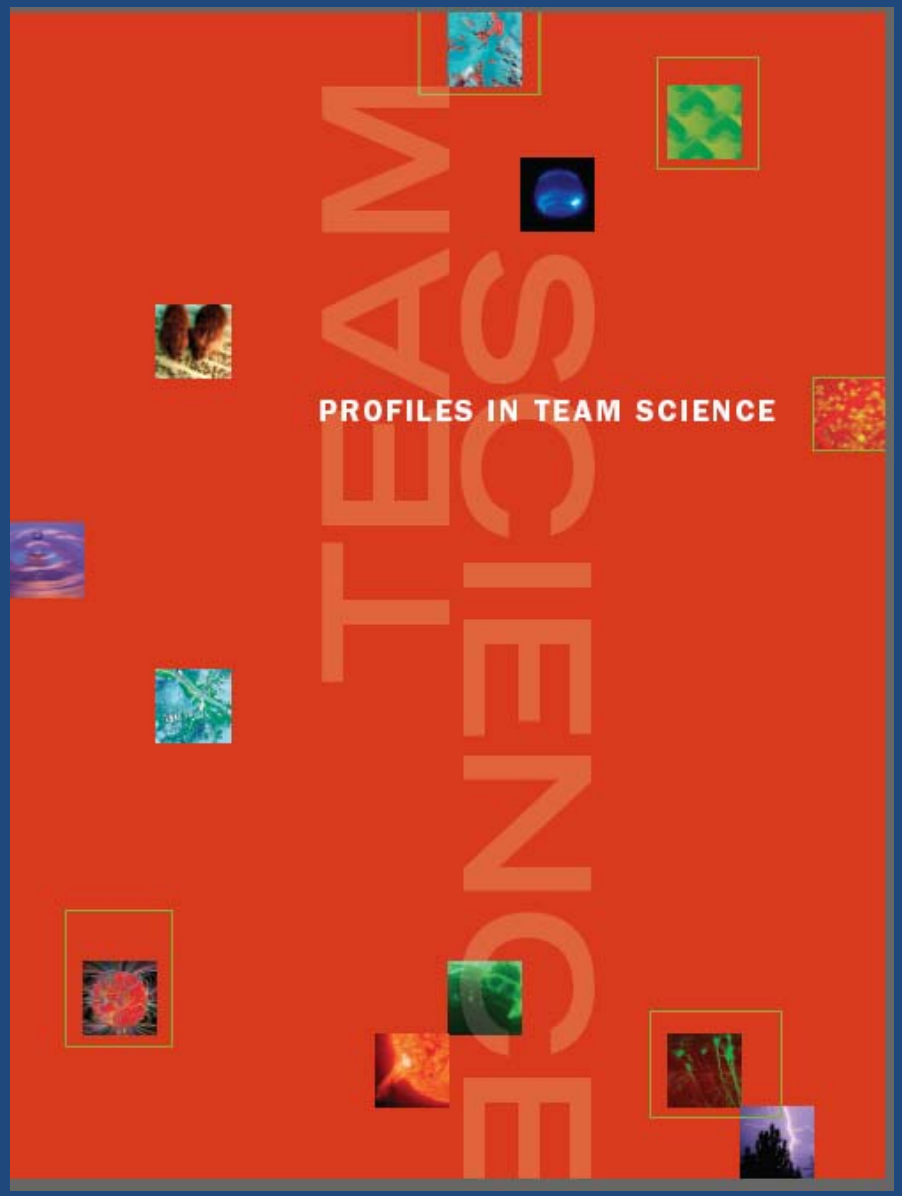
“Asked to name one thing they hate about their jobs, many scientists say grant applications. Nature's reporters have asked researchers just why the process is so frustrating, and what can be done to improve matters.”

Science and Technology Centers: Integrative Partnerships

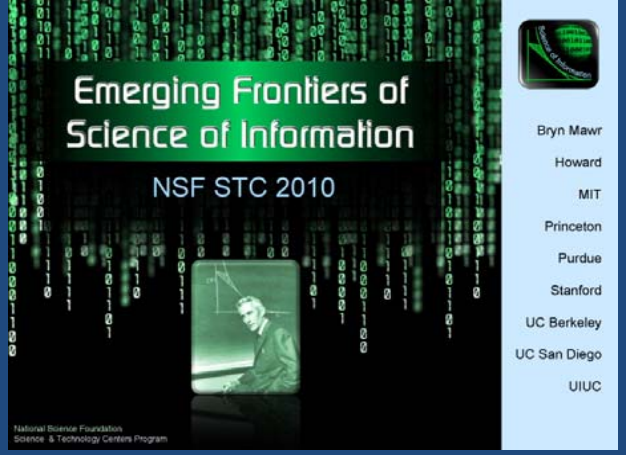
Innovative, potentially transformative, complex research and education projects that require large-scale, long-term awards.

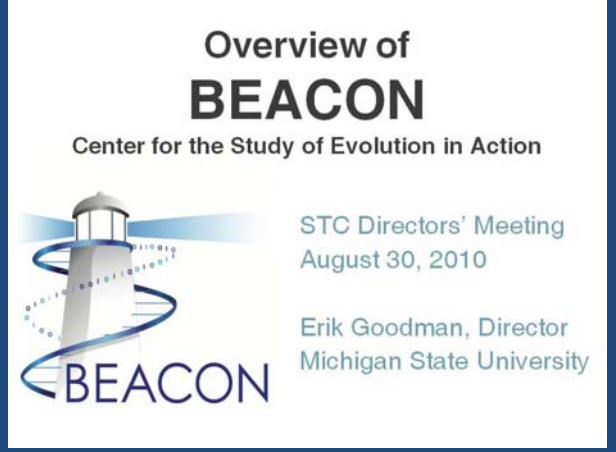
A means to undertake important investigations at the interfaces of disciplines and/or fresh approaches within disciplines.

NSF expects STCs to demonstrate leadership in the involvement of groups traditionally underrepresented in science and engineering at all levels within the Center.



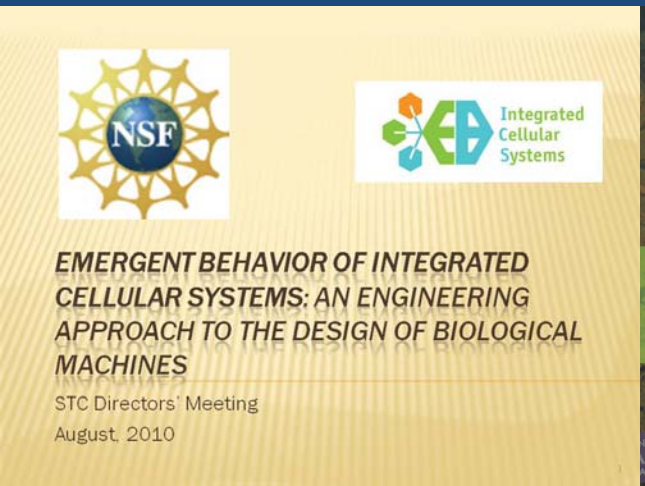
http://depts.washington.edu/teamsci/welcome.html

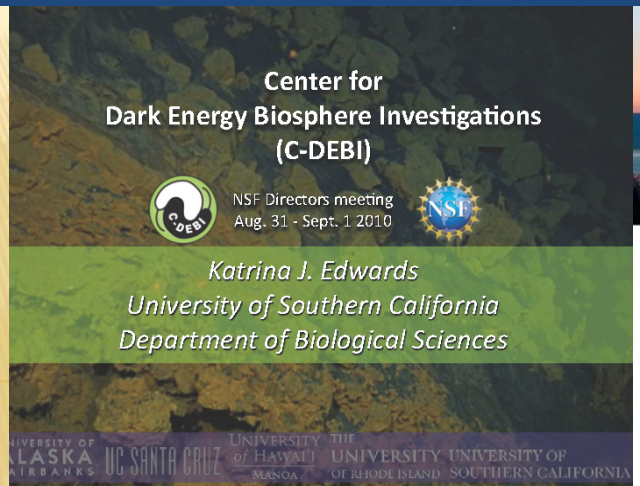


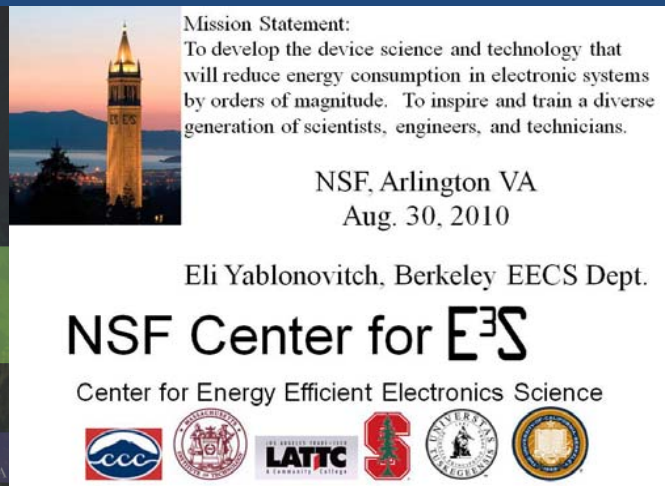


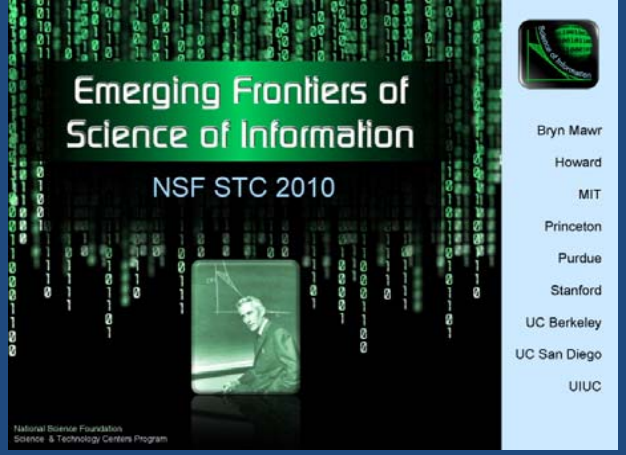
Five new STCs established in 2010

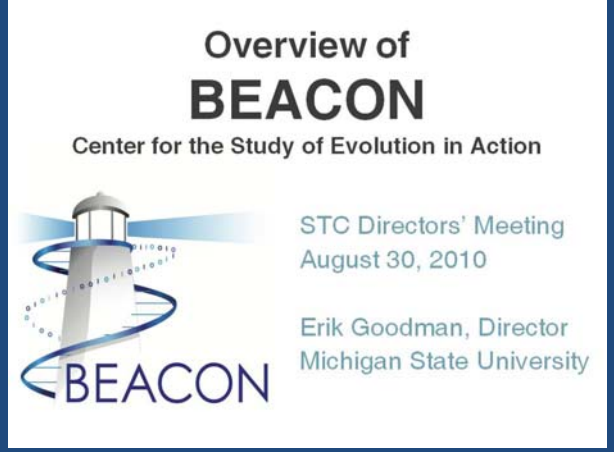
New solicitation in FY 2011









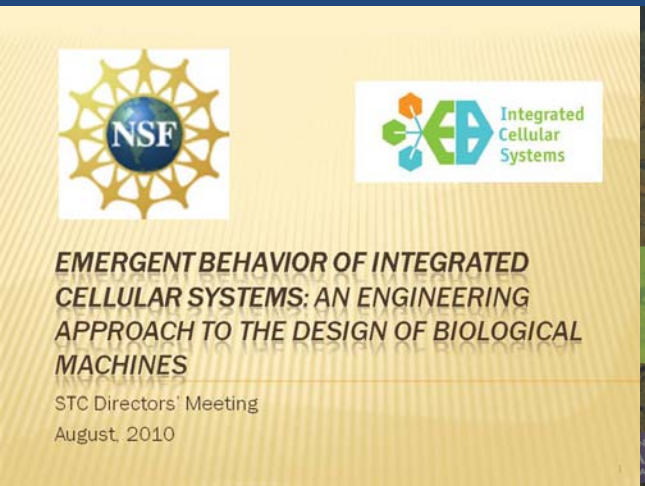


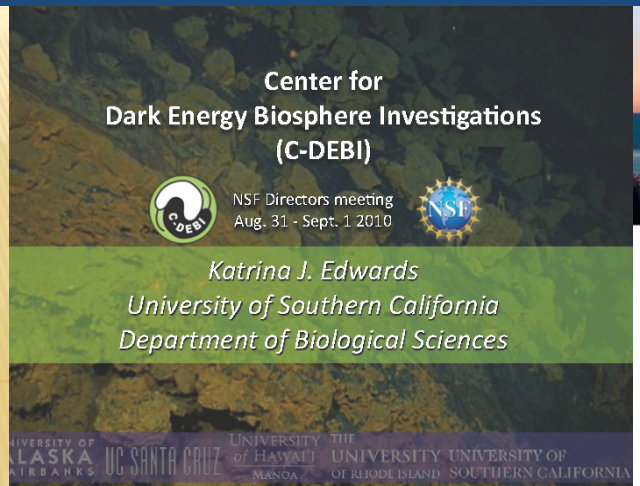
Five new STCs established in 2010

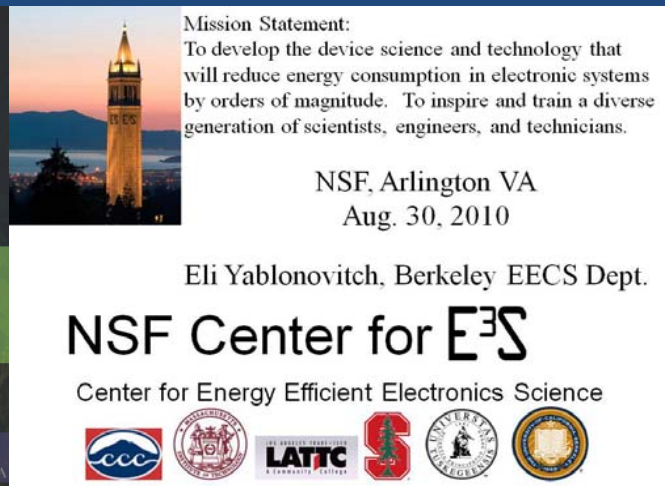
NSF Builds Science and Engineering Capacity in Communities Around the U.S.

http://nsf.gov/dir/index.jsp?org=OIA

New solicitation in FY 2011







Major Research Instrumentation (MRI)

http://nsf.gov/dir/index.jsp?org=OIA

- Congressionally mandated program since 1990s
- Annual competition – FY11 solicitation soon
- Supports acquisition and development of major research instruments
- Coordinated by OIA in partnership with NSF Directorates and Offices (Working Group)
  - Award made by the appropriate NSF Program

Major Research Instrumentation (MRI)

http://nsf.gov/dir/index.jsp?org=OIA

- Proposal limit “2 + 1” per institution
- Award size from $100,000 to $4 million**
- Standard grants – up to 3Y acquisition, 5Y development
- 30% cost sharing, but non-PhD-granting academic institutions are exempt

Major Research Instrumentation (MRI)

http://nsf.gov/dir/index.jsp?org=OIA

- Next solicitation SOON
  - contact Randy Phelps or Craig Henderson:
  - *mri@nsf.gov*
- Previous solicitation (for guidance):
  - Solicitation 10-529
- Program web page: see
  - *What Has Been Funded (Recent Awards Made Through This Program, with Abstracts)*

Cyber-Enabled Discovery and Innovation (CDI)

NSF's bold five-year initiative to create revolutionary science and engineering research outcomes made possible by innovations and advances in computational thinking

Cyber-enabled Discovery and Innovation

Cross-NSF: all directorates participating

Goals

- To support multi-disciplinary research for advancing more than one field of science or engineering as they become increasingly computational (referring to computational concepts, methods, models, algorithms, tools, as applied to all fields of science and engineering)

- To produce paradigm shifts in our understanding of science and engineering phenomena and socio-technical innovations

CDI

CDI seeks ambitious, transformative, multidisciplinary research proposals in or across the following areas

- From Data to Knowledge: enhancing human cognition and generating new knowledge from a wealth of heterogeneous digital data.
- Understanding Complexity in Natural, Built, and Social Systems: deriving fundamental insights on systems comprising multiple interacting elements.
- Virtual Organizations: enhancing discovery and innovation by bringing people and resources together across institutional, geographical and cultural boundaries.

CDI

Contact
(703) 292-8080 / cdi@nsf.gov

FY 2010 (43 awards/ $36M)

FY 2011 – Coming Soon

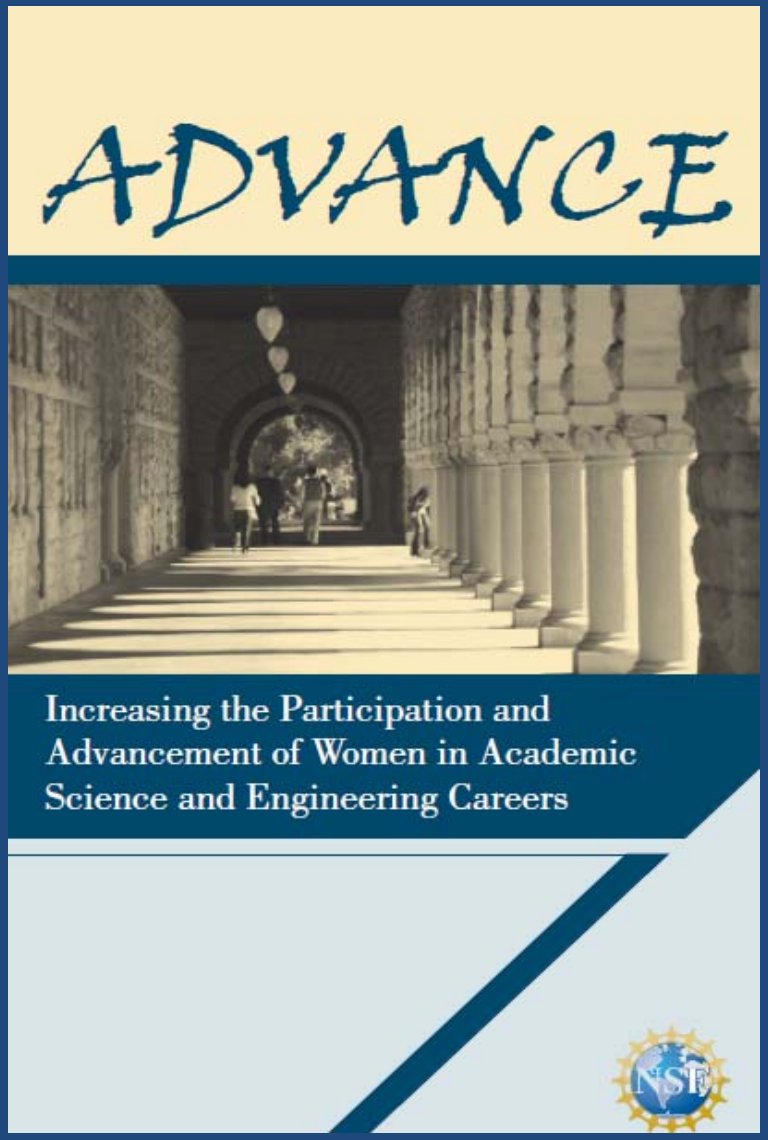
Type I Awards

- Two investigators with complementary expertise; two graduate students; and their collective research needs (e.g., materials, supplies, travel) for three years

Type II Awards

- Three investigators with complementary expertise; three graduate students; one or two senior personnel (including post-doctoral researchers and staff); and their collective research needs for four years

ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers



- Contact
  - Kelly Mack (EHR)
  - (703) 292-8575
  - kmack@nsf.gov
- Partnership for Adaption, Implementation, Dissemination
- Deadlines
  - LOI: 10/4/10
  - Full Proposal: 11/8/10

ADVANCE

Program Goal

- To increase the representation and advancement of women in academic science and engineering careers
- Both men and women may submit proposals to this program

Projects Supported in 2009-2010

- Institutional Transformation (IT) Projects systemically and permanently change institutional practices to promote women in STEM academics
- IT-Catalyst Projects support the evaluation of current institutional activities to identify areas for transformation and cultural change
- **Partnerships for Adaptation, Implementation, and Diffusion (PAID) Projects** adapt, implement, and/or distribute exemplary programs, policies, and practices to new institutions or settings

www.advance-portal.net

HOME ABOUT MAP ADVANCE GRANTEES CONTACT SEARCH

ADVANCE

for the advancement of women in science and engineering careers

NSF

- Activities & Events
- ADVANCE Initiatives
- ADVANCE Program & Work
- Diversity & Equity
- Electronic Resources by Type
- Initiatives by Person
- On The Job
- Resources

Welcome to the home page of the Advance Portal Website. This site aims to link the activities of Advance Institutional Transformation Grant recipients. You can find information using the menus on the left of the page or the search feature on the right. If you have any questions about anything here or know of links that should be added, feel free to contact us.

Announcements

ADVANCE solicitation, July 26, 2010 **by** Tom DeHart

A new ADVANCE solicitation has been posted on

ADVANCE Grantees

Take a look at all first, second, third, and fourth round of NSF ADVANCE grant recipient's websites here.

ADVANCE at NSF

"The goal of the ADVANCE program is to develop systemic approaches to increase the representation and advancement of women in academic science, technology, engineering and mathematics (STEM) careers, thereby contributing to the development of a more diverse science

National Science Foundation

National Science Board

Director
Deputy Director

Office of IG

BIO
CISE
ENG
GEO
MPS
SBE
EHR

OD Offices with Program Components

Office of Polar Programs
Karl A. Erb, Director

Office of Integrative Activities
W. Lance Haworth, Director

EPSCoR Office
Henry N. Blount, Director

Office of Cyberinfrastructure
Alan Blatecky, Acting Director

Office of International Science & Engineering
Larry H. Weber, Acting Director

OD Offices

BFA
OGC
OIRM
OLPA
OEOP

EPSCoR Objectives

- Build research capacity, competitiveness
- Broaden individual, institutional participation in STEM
- Promote development of a technically engaged workforce
- Foster collaborative partnerships

- Multi-faceted State-wide Programs

EPSCoR Origins

- NSF's 1979 statutory authority "authorizes the Director to operate an Experimental Program to Stimulate Competitive Research (EPSCoR)…"

- To assist NSF's statutory function "to strengthen research and education in science and engineering throughout the United States and to avoid undue concentration of such research and education."

NSF EPSCoR Jurisdictions

1980
Arkansas
Maine
Montana
South Carolina
West Virginia

1985
Alabama
Kentucky
Nevada
North Dakota
Oklahoma
Puerto Rico
Vermont
Wyoming

1987
Idaho
Louisiana
Mississippi
South Dakota

1992
Kansas
Nebraska

2000
Alaska

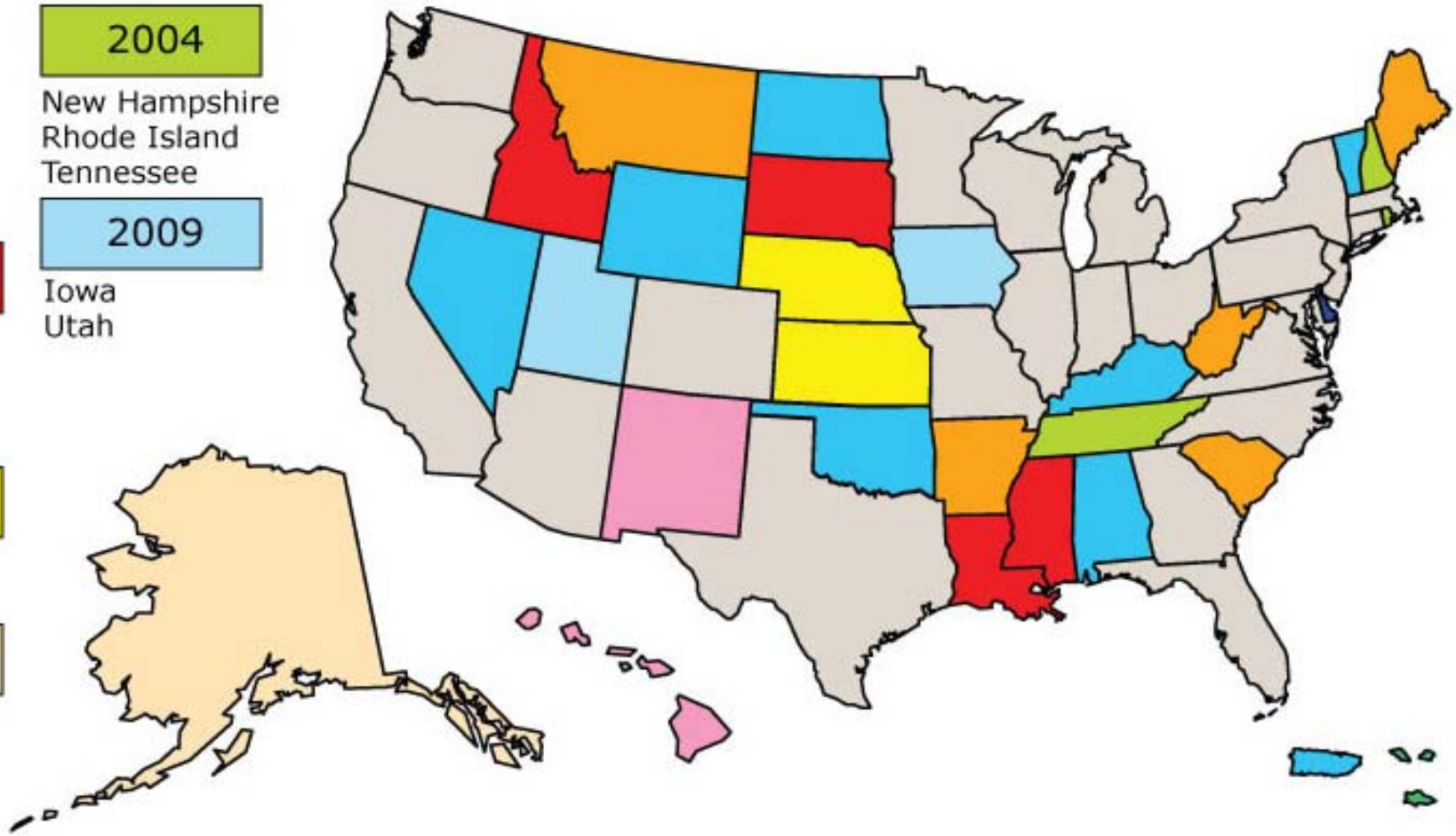
2001
Hawaii
New Mexico

2002
U.S. Virgin Islands

2003
Delaware

2004
New Hampshire
Rhode Island
Tennessee

2009
Iowa
Utah



EPSCoR Investment Strategies

- Research Infrastructure Improvement
  - RII Track-1
  - RII Track-2
  - RII C2
- Co-Funding
- Outreach and Workshops

Stats: the 29 Jurisdictions…

- 21% of the nation's total population
- 24% of the research institutions
- 16% of the employed scientists and engineers

- Receive about 12% of all NSF research funding

Fundamentally

- NSF and EPSCoR support science and engineering research and education
- Must adapt to how science and engineering research and education change over time

Research Is Changing

- Geographically distributed communities
  - Numerous labs, universities, industry
- Integration with other national resources
  - Increasingly multi-agency, multi-disciplinary
- Computational S&E
- Extremely large quantities of data
  - Petabyte data sets, with complex access patterns
  - Also thousands of SMALL data sets
  - None of it tagged as you need it, or in the right format

Fundamental Change in Science

- Modern science
  - Data- and compute-intensive
  - Integrative
- Multiscale Collaborations
  - Additional complexity
  - Individuals, groups, teams, communities
- Transitioning research approach to address these issues
- One way is through use of CI

EPSCoR Co-Funding

- Joint support
  - Proposals submitted by EPSCoR researchers
  - Proposals submitted to non-EPSCoR NSF programs
- Merit reviewed and recommended for award
  - Could not be funded without the combined, leveraged support of EPSCoR and the Research and Education Directorates and Offices
- FY 2009
  - 400 Requests; 251 Co-Investments ($40.5 M)

EPSCoR Co-Funding Essentials

- Reviewed and Recommended for Funding within NSF Directorates and Offices
- Combined leveraged support necessary for funding
- Characteristics favoring Co-funding:
  - New PIs
  - Multidisciplinary
  - Broaden participation
  - R/T Ops for St/Tchrs
  - Collaborative
  - Synergistic
  - Instrumentation
  - Integration of R&E
- Tipping Point is Financial!

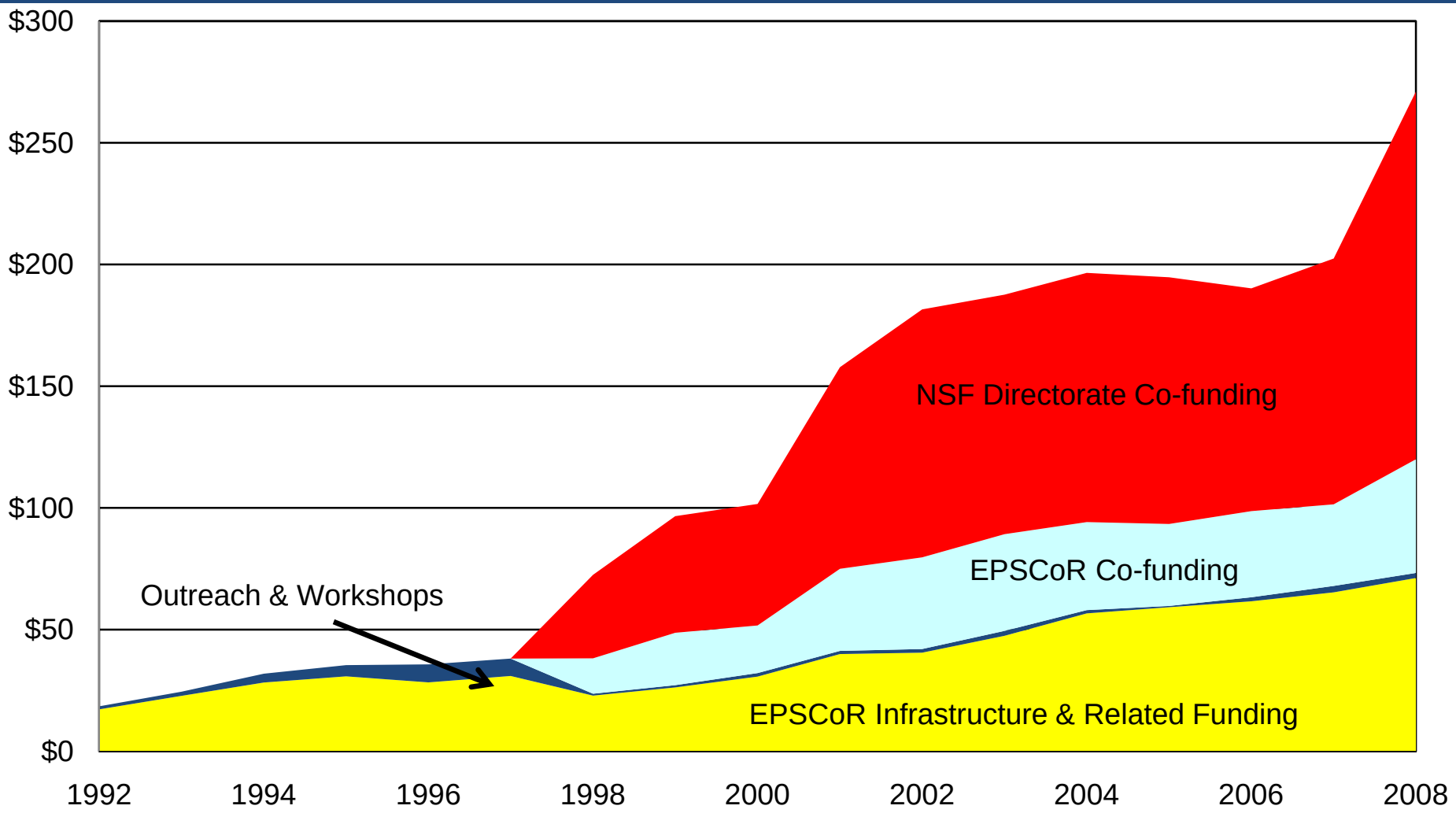
Co-Funding: What can you do?

- Program Officer of the program you submit to is responsible for submitting eligible proposals to EPSCoR
- Make sure the reviewers know you're in an EPSCoR state
  - Mention it in the narrative
  - Talk about how you're leveraging other EPSCoR work
  - Make sure the program PO knows you're from an EPSCoR state
  - When you're a reviewer – comment on this in your review!

Development of State Strategic Science and Technology Business Plans

- RII Track-1 program requires that proposal is developed in this context
- Idaho Plan is in place
  - great to hear this is being updated!
- This is the best way to leverage your state support

EPSCoR Leveraging with Funds from NSF Disciplinary Directorates ($M)



Seeking Funding from NSF?

Consult the Website: www.nsf.gov

- Search Recent Awards: www.nsf.gov/awardsearch
- Identify possible funding opportunities: www.nsf.gov/funding
- Talk to a Program Officer!
- Consult the *Proposal and Award Policies and Procedures Guide:* www.nsf.gov/publications/pub_summ.jsp?ods_key=papp
- Review solicitation requirements
- Serve as a panelist!
- Talk to successful PIs
- Know NSF's role compared to other Federal agencies

Ask Early, Ask Often!

Staff Directory

http://www.nsf.gov/staff

Organization List

http://www.nsf.gov/staff/orglist.jsp

Thank You!

lhaworth@nsf.gov