Computer and Information Science and Engineering

Exploring the frontiers of computing

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

April 2014

CISE Organization

Office of the Assistant Director for CISE

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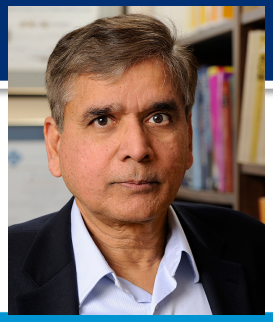
Computing and Communications Foundations

Division Director
Dr. Rao Kosaraju



Advanced Cyberinfrastrcutre

Division Director
Irene Qualters

Computer and Network Systems

Division Director
Dr. Keith Marzullo

Information and Intelligent Systems

Division Director
Dr. Howard Wactlar

Overview of CISE Support

CISE Supports:

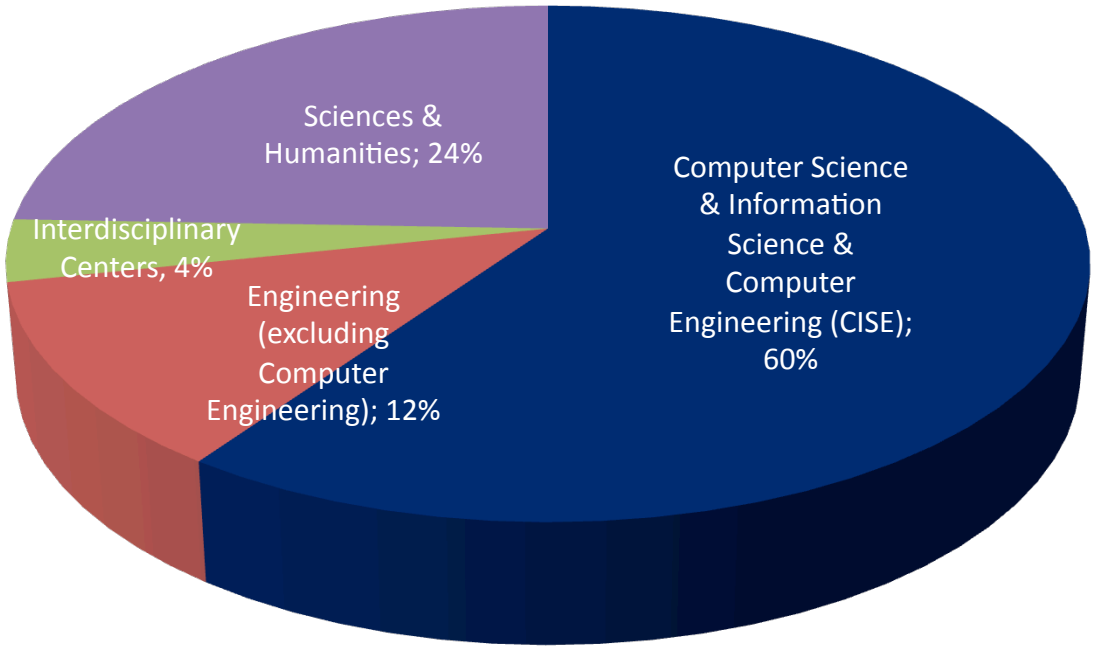
- Investigator-initiated **research** in all areas of computer and information science and engineering
- Cutting-edge national computing and information **infrastructure** for research and education
- **Education and training** of the next generation of computer scientists and engineers

Through:

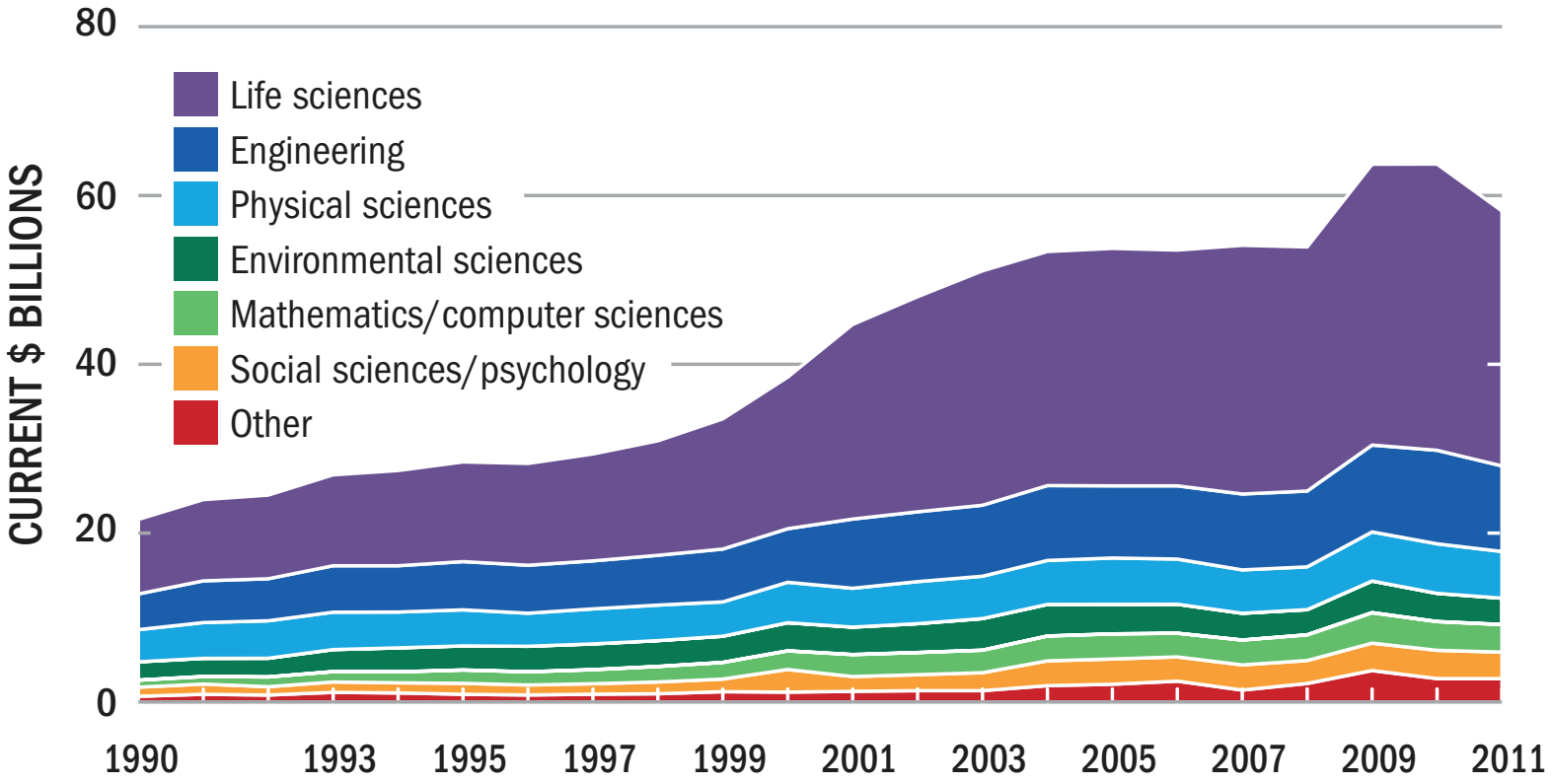
- CISE Core programs
- CISE Cross-cutting programs
- NSF Cross-cutting programs

Who comprises the CISE community?

PI and Co-PI Departments for FY 2012 Awards Funded by CISE



Federal basic and applied research funds, by S&E field: 1990–2011



SEI 2014: **Federal Spending on Research, by Field**, Chapter 4.

Advanced Cyberinfrastructure (ACI)

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

Coordinates and supports the acquisition, development, and provision of state-of-the-art cyberinfrastructure resources, tools, and services essential to the conduct of 21st century science and engineering research and education.

- *Campus Cyberinfrastructure – Network Infrastructure and Engineering Program (CC-IIE):* Improvements and re-engineering at the campus level to support a range of scientific data transfers and movement.
- *Data Infrastructure Building Blocks (DIBBS):* Development and implementation of new methods, management structures, and technologies to store and manage the diversity, size and complexity of current and future data sets and streams.
- *Software Infrastructure for Sustained Innovation (SI2-S2I2):* Goal of transforming innovations in research and education into sustained software resources that are an integral part of the cyberinfrastructure.

Computing & Communication Foundations (CCF)

http://www.nsf.gov/div/index.jsp?org=CCF

Supports research and education projects that explore the foundations of computing and communication devices and their usage.

- *Algorithmic Foundations (AF):* Innovative research characterized by algorithmic thinking and algorithm design, accompanied by rigorous mathematical analysis.
- *Communications and Information Foundations (CIF):* Transformative research addressing the theoretical underpinnings and current and future enabling technologies for information acquisition, transmission, and processing in communication and information networks.
- *Software and Hardware Foundations (SHF):* Foundational research essential to advance the capability of computing systems, including software and hardware components, systems, and other artifacts.

Information and Intelligent Systems (IIS)

http://www.nsf.gov/div/index.jsp?div=IIS

Supports research and education activities that study the inter-related roles of people, computers, and information.

- *Cyber-Human Systems (CHS):* Research that explores creative ideas, novel theories, and innovative technologies that advance our understanding of the complex and increasingly coupled relationships between people and computing.

- *Information Integration and Informatics (III):* Information technology research on the processes and technologies involved in creating, managing, visualizing, and understanding diverse digital content in circumstances ranging from individuals through groups, organizations, and societies, and from individual devices to globally-distributed systems, and that can transform all stages of the knowledge life cycle.

- *Robust Intelligence (RI):* Research that encompasses all aspects of the computational understanding and modeling of intelligence in complex, realistic contexts to advance and integrate the traditions of artificial intelligence, computer vision, human language research, robotics, machine learning, computational neuroscience, cognitive science, and related areas.

Computer and Network Systems (CNS)

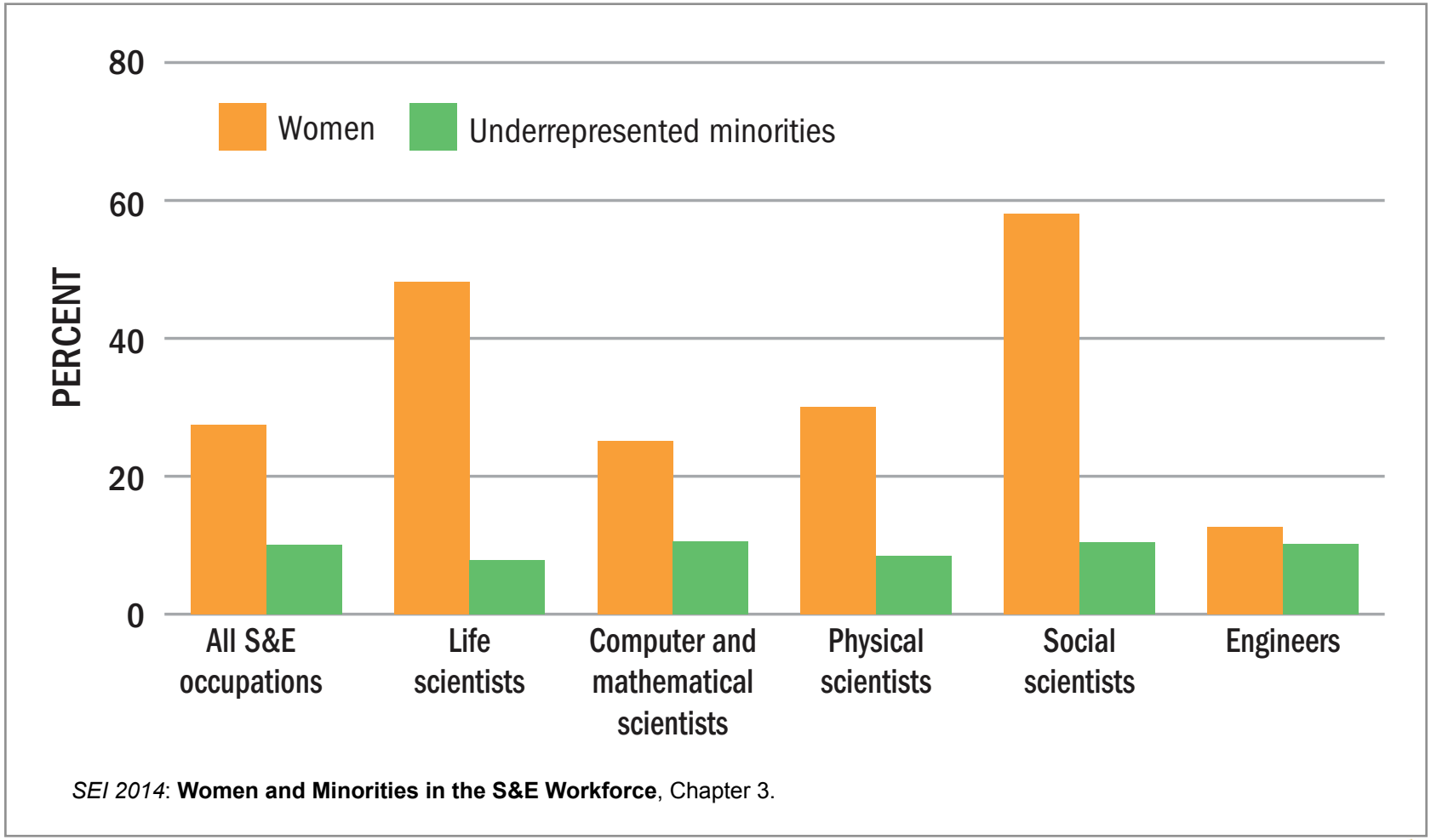
http://www.nsf.gov/div/index.jsp?div=CNS

Supports research and education activities that invent new computing and networking technologies and that explore new ways to make use of existing technologies.

- *Computer Systems Research (CSR):* Transformative research on fundamental scientific and technological advances leading to the development of future generation computer systems (e.g., new architectures; distributed real-time embedded devices; pervasive, ubiquitous and mobile computing; file and storage systems; new programming models, abstraction, languages, compilers, and operating systems; reliable, fault-tolerant and secure hard/middle/software; …).

- *Networking Technology and Systems (NeTS):* Transformative research on fundamental scientific and technological advances leading to the understanding, development, engineering, and management of future-generation, high-performance computer networks.

Women and underrepresented minorities in S&E occupations: 2010



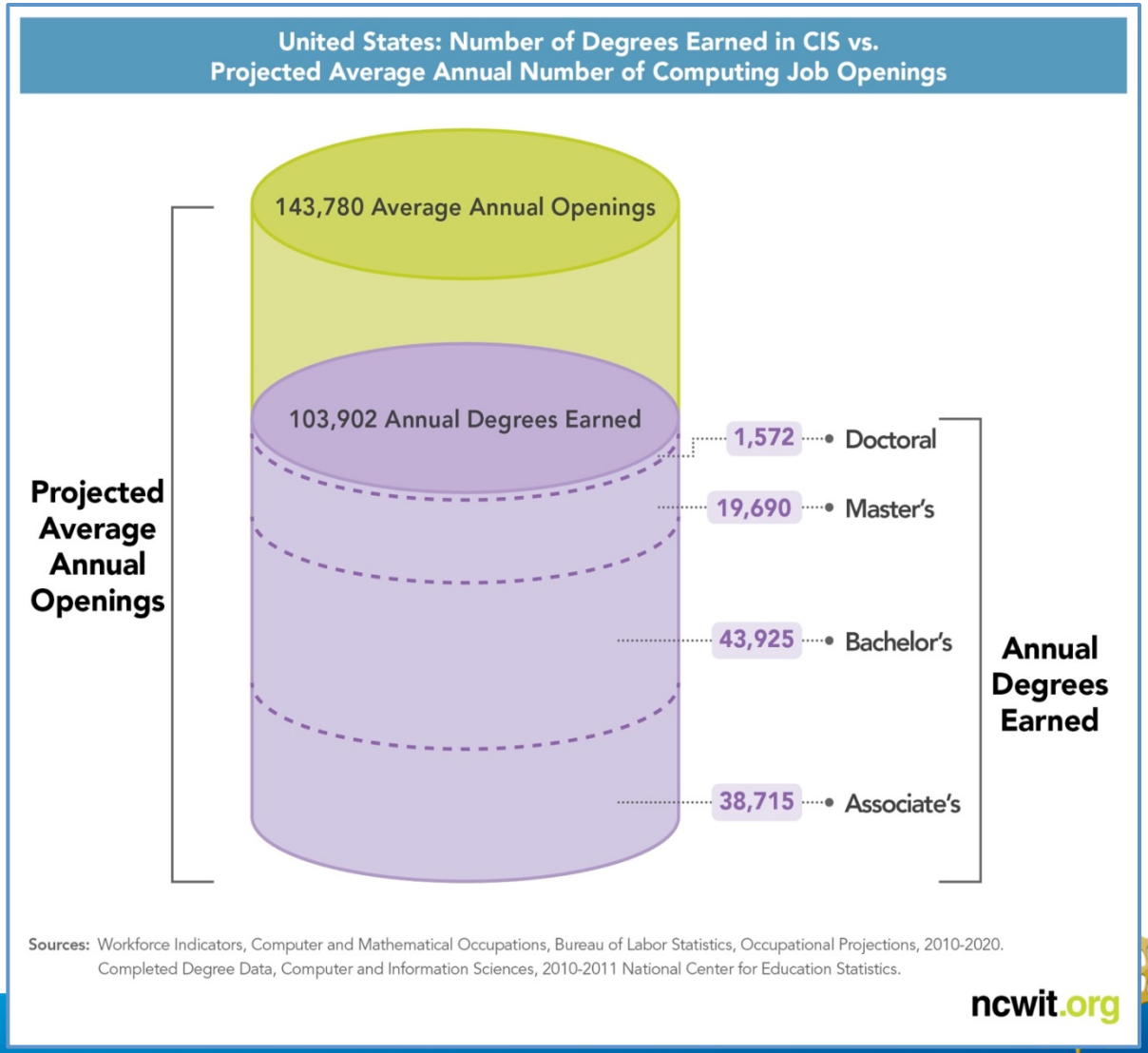
SEI 2014: **Women and Minorities in the S&E Workforce**, Chapter 3.

The computing community faces three significant and interrelated challenges in workforce development

Underproduction of degrees

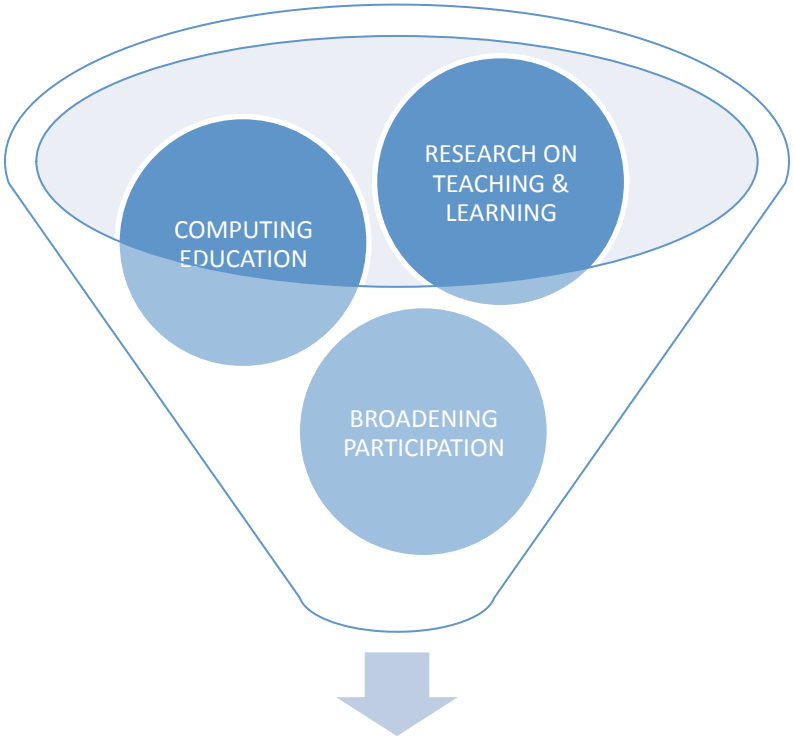
Under-representation

Lack of a presence in K-12



Computing Education for the 21st Century (CE21)

Enhancing computational competencies



CE21

Goals:

- Increase number and diversity of K-14 students and teachers who develop and practice computational competencies.
- Increase number of postsecondary students who have background necessary to pursue degrees in computing and computationally-intensive fields.

Cross-Directorate Solicitation: CISE, EHR, OCI

Sample of CISE Cross-Cutting Programs

For a comprehensive list of CISE funding opportunities, visit:
http://www.nsf.gov/funding/pgm_list.jsp?org=CISE

- Cross-Division
  - *Expeditions in Computing*
    Exploring new frontiers in computing and information science.
- Cross-Directorate
  - *Cyberlearning: Transforming Education (CTE)*
    Designing and implementing technologies to aid and understand learning.
  - *Cyber-Physical Systems (CPS)*
    Integrating computation, communication, and control into physical systems.
  - *Enhancing Access to the Radio Spectrum (EARS)*
    Enhancing access to wireless service and/or efficiency with which radio spectrum is used.
  - *Secure and Trustworthy Cyberspace (SaTC)*
    Securing our Nation's cyberspace from malicious behavior, while preserving privacy and promoting usability.
  - *Smart and Connected Health (SCH)*
    Transforming healthcare knowledge and delivery, and improving quality of life through IT.
  - *NSF Research Traineeship Program (NRT)*
    IGERT replacement.
- Cross-Agency
  - *Cyber-Physical Systems (CPS)*
    Developing core system science to engineer complex CPSupon which people can depend with high confidence.
  - *National Robotics Initiative (NRI)*
    Developing and using robots that work alongside, or cooperatively with, people.

NSF-wide Opportunities for the CISE Community

- Faculty Early Career Development (CAREER)
- Grants for Rapid Response Research (RAPID)
- EArly-concept Grants for Exploratory Research (EAGER)
- Graduate Research Fellowship Program
- Research Experiences for Undergraduates (REU)
- Conferences, Summer Schools, and Workshops
- International Collaborations

For a comprehensive list of NSF funding opportunities, visit:
http://www.nsf.gov/funding/

Initiation Grants

Some divisions have initiation grants

- BRIGE: Broadening Participation Research Initiation Grants in Engineering NSF 13-534

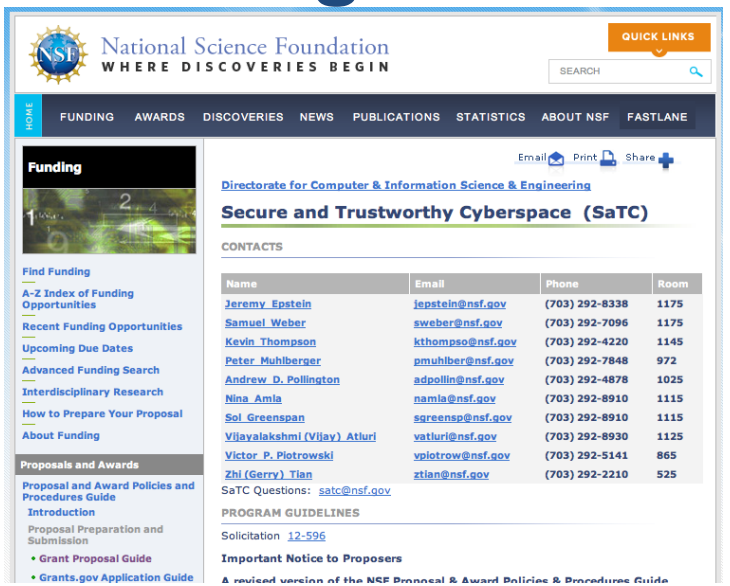
  Designed to promote the development of early career faculty who will become champions for diversity and broadening participation of underrepresented groups in engineering throughout their careers.

- OCE-RIG: Ocean Sciences Research Initiation Grants NSF 13-606

  provide start up funding for researchers who have been recently appointed to tenure track (or equivalent) positions, with the twin goals of enhancing the development of their research careers and broadening the participation of under-represented groups in ocean sciences.

Find out what we're funding

All of the awards we have made– PI names and institutions, proposal abstracts, program that funded award, amount awarded, papers reported to have been done under project, etc. – are available.



Go here!

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Become a panelist

One way to volunteer to be a panelist:

i. Identify a program/call in which your research fits but for which you won't be submitting this year.

ii. Select a program officer in that program.

iii. Two weeks after submission closes, send a short message to that program officer including:
   - a self-introduction including your research interest
   - ask to serve on a panel
   - an attached CV

Don’t be a stranger!

- plan a visit.
- let your program director know of accomplishments.
- discuss with program directors your ideas to find the best program.

Thanks!

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