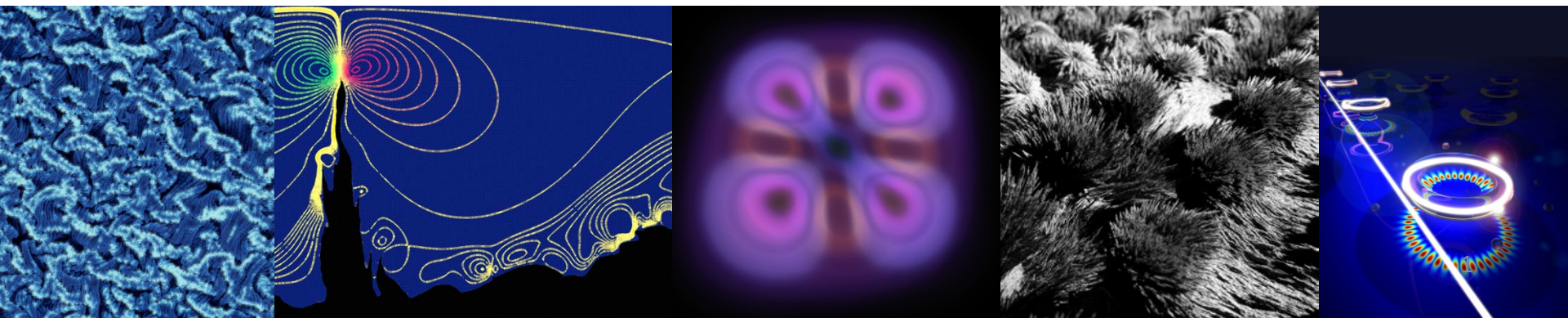


NSF Directorate for Engineering

Cecile Gonzalez
Regional Grants Conference
October 6-7, 2014



ENG Mission

To enable the engineering and scientific communities to advance the frontiers of **engineering research, innovation, and education**, in partnership with the engineering community, and in service to society and the nation

Proposal Submission

- The right program for a proposal depends on the research objective
- The research goal is to obtain a fundamental understanding of...
- The research objective is to test the hypothesis...
- Winning proposals need both a research objective and a plan to accomplish the objective

NSF Supports Research

- Winning proposals focus on research, not development
- If the focus of the proposal is an artifact (a device, system, product, process,...), it's probably development
- If the focus of the proposal is knowledge (the truth of an hypothesis), it's probably research

Steps towards Successful Proposals

- Begin with
 - Dialog with program officer
 - White paper
 - Short biography
- Get involved with NSF reviews

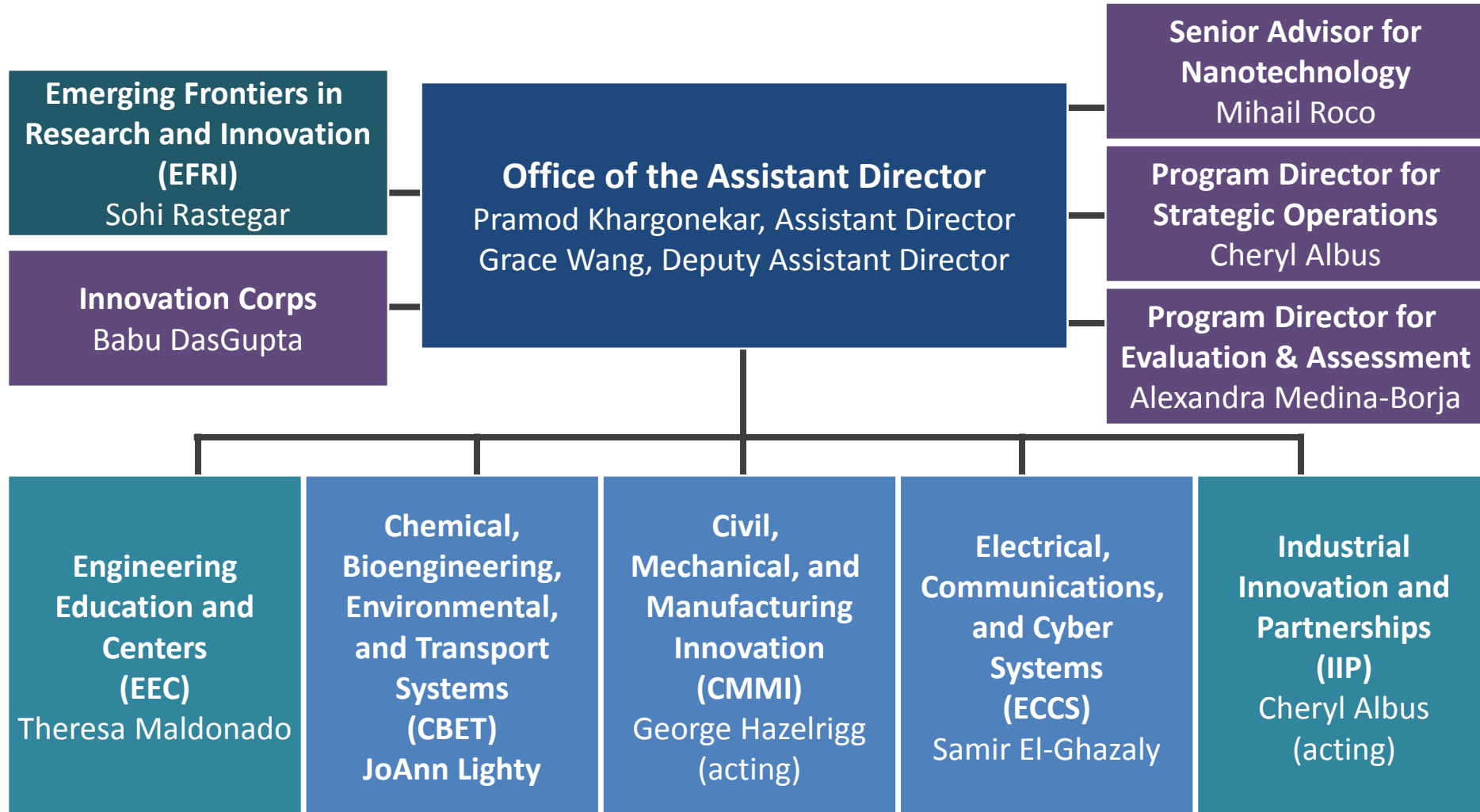
Ethics

- Persons submitting proposals to the Federal government are held to high standards of conduct
- Misbehavior can be dealt with quite severely
 - PI barred from submission to NSF up to 2 years
 - Permanently barred from proposal review
 - At least two cases of jail time (Grimes case, 42 months in Federal prison)
 - Maximum \$250,000 fine, 5 years in prison
- Institutions must train and verify

Major Forms of Misbehavior

- Plagiarism—uncited reproduction of the work of others
- Falsification—intentional misrepresentation of data or results (progress reports)
- Fabrication—making up data
- Double charges—billing the government twice for the same work

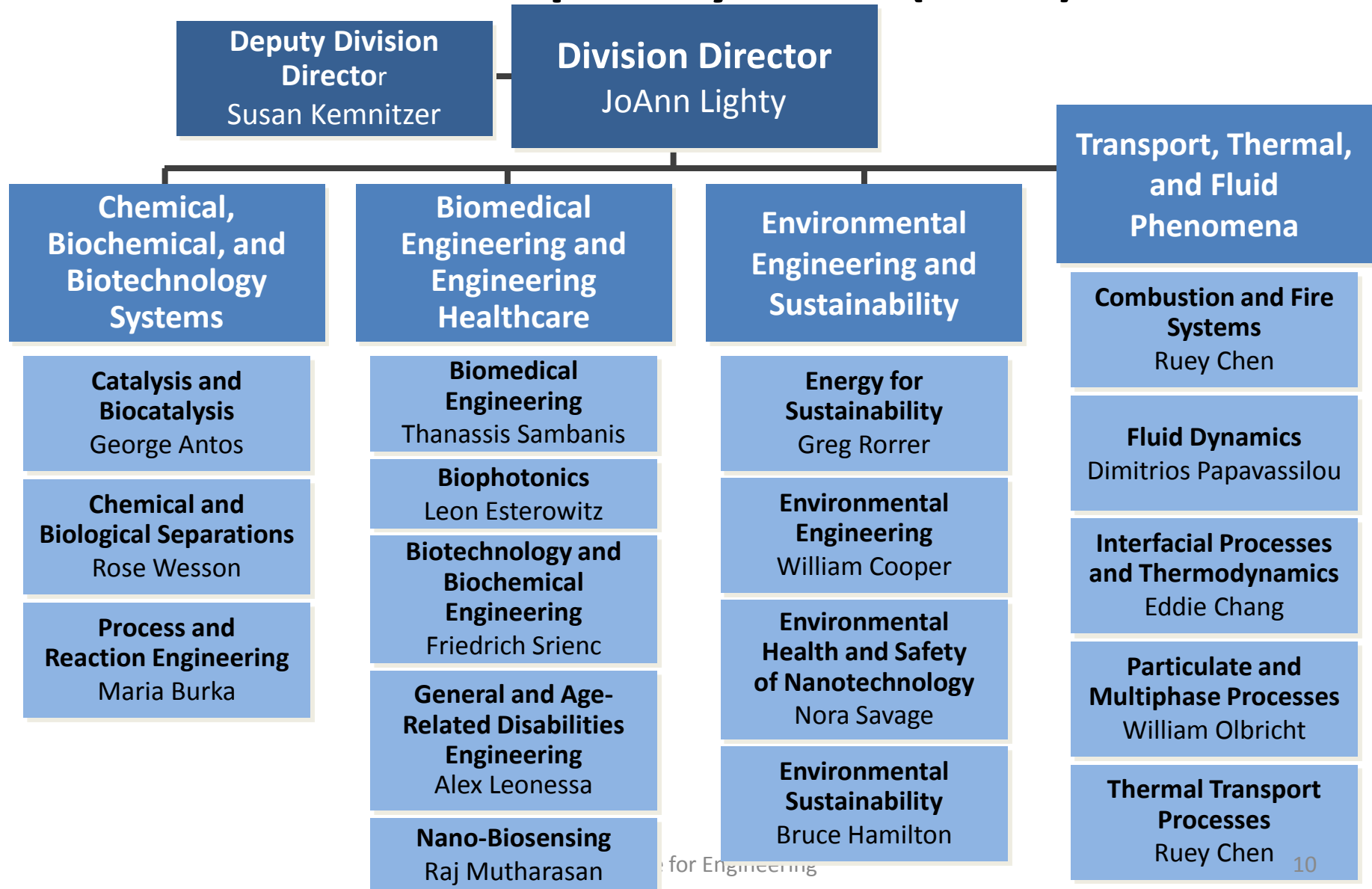
NSF Directorate for Engineering (ENG)



Emerging Frontiers in Research and Innovation (EFRI)

- High-risk, high-payoff opportunities that:
 - Are potentially transformative
 - Address a national need or grand challenge
- FY 2015 topic area is 2-Dimensional Atomic-Layer Research and Engineering (2-DARE)
- \$31M for 4-year awards at ~\$500K per year

Chemical, Bioengineering, Environmental, and Transport Systems (CBET)



CBET Areas of Interest

Chemical, biochemical, and biotechnology

- processing and manufacturing of products with chemical and renewable resources

Biomedical engineering and engineering healthcare

- integration of engineering and life science to solve biomedical problems

Environmental engineering and sustainability

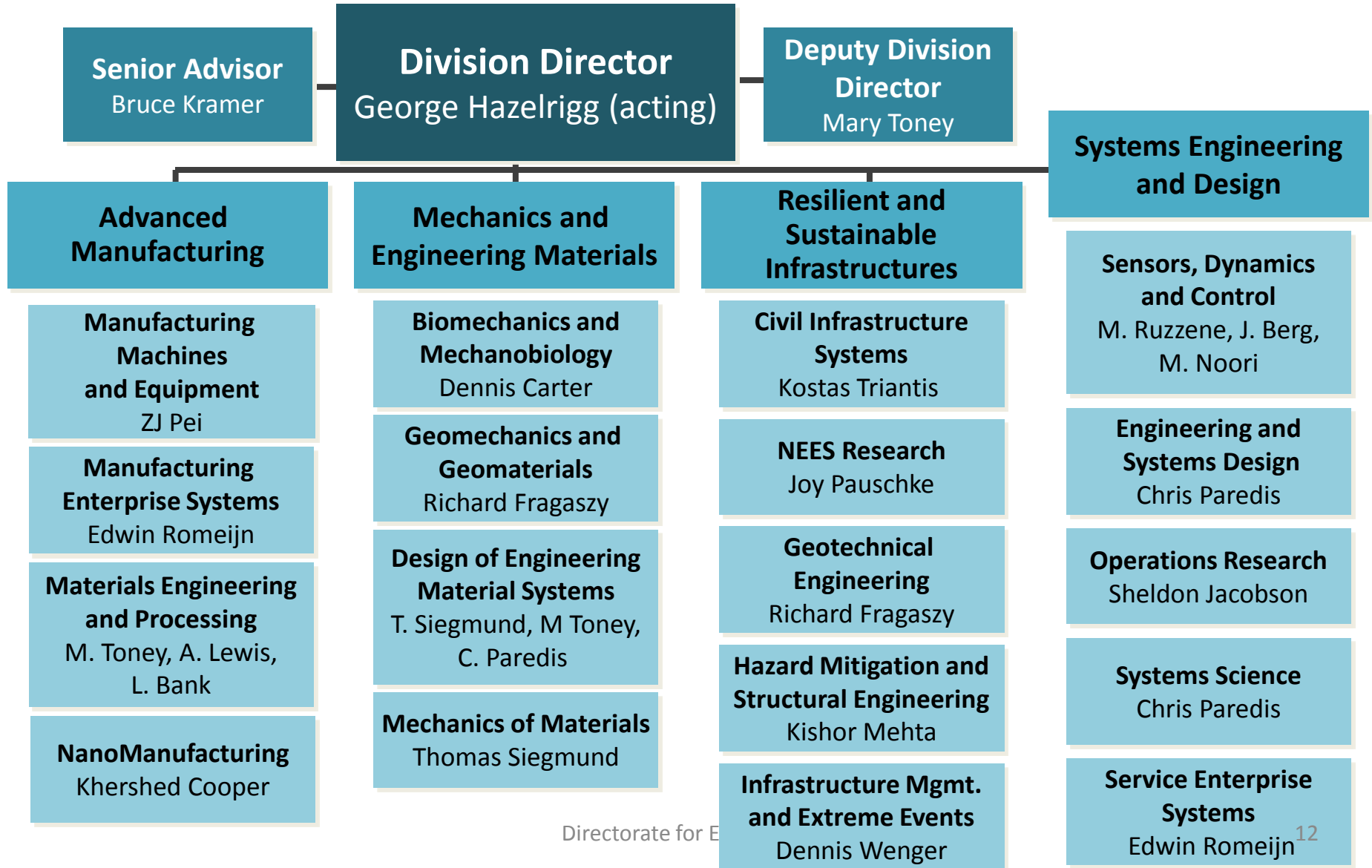
- reduction of adverse effects of solid, liquid, and gaseous discharges into land, waters, and air that result from human activity

Transport and thermal fluids phenomena

- thermal, mass, and momentum transport that enable new technological solutions (energy, environment, manufacturing, health care, ...)

ONE submission deadline per year: Nov. 5, 2014, and Oct. 20 annually thereafter

Civil, Mechanical, and Manufacturing Innovation (CMMI)



CMMI Areas of Interest

Advanced Manufacturing

- transformative advances in manufacturing and materials processing, with emphases on efficiency, economy, sustainability and scalability

Mechanics and Engineering Materials

- understanding the properties and use of materials in engineered and natural systems

Resilient and Sustainable Infrastructures

- innovation to advance resilience and sustainability of civil infrastructure and distributed infrastructure networks

Systems Engineering and Design

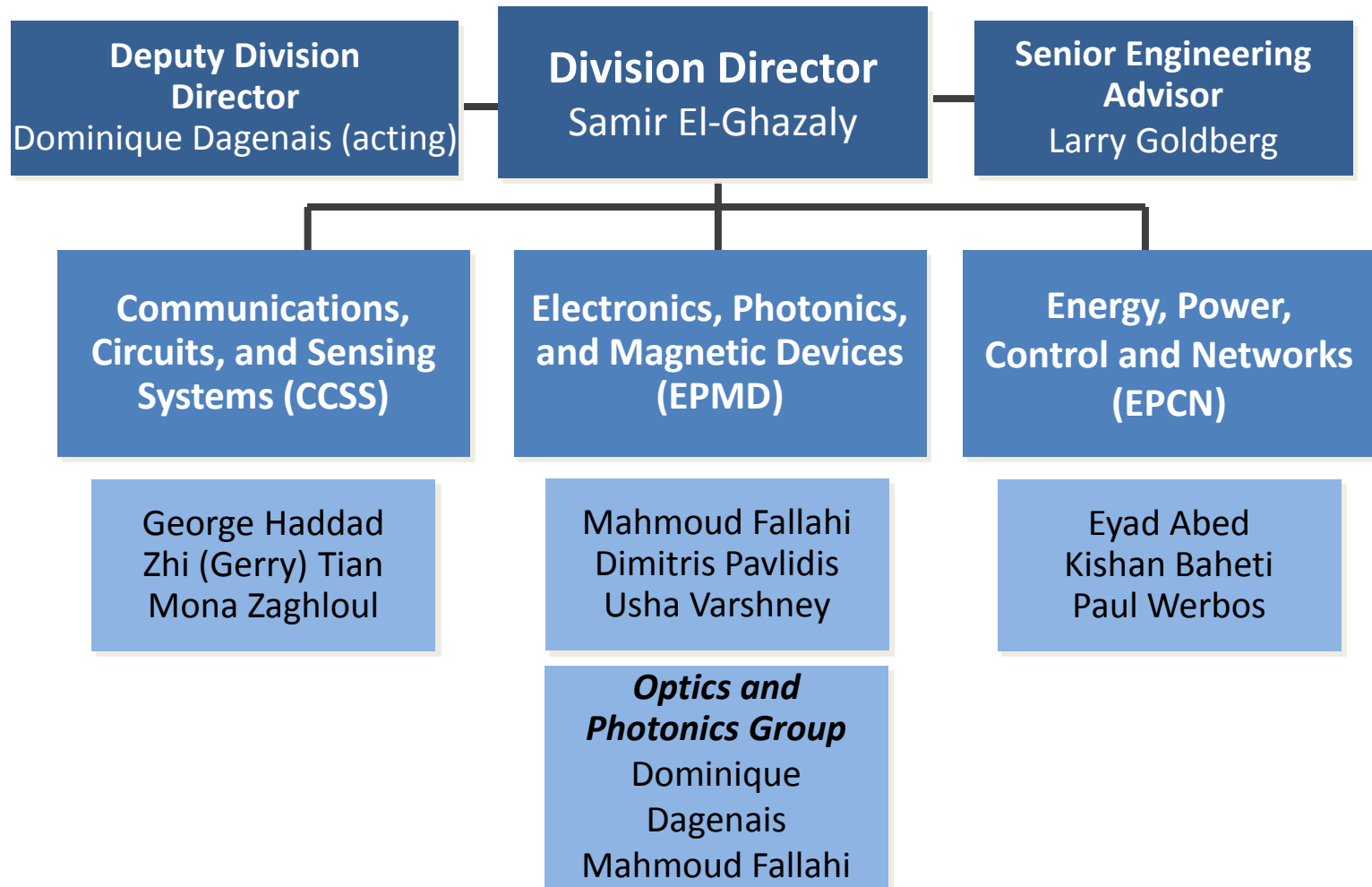
- decision-making aspects of engineering, including design, control, optimization and systems science

TWO submission deadlines each year: Sept. 15 and Feb. 15

Natural Hazards Engineering Research Infrastructure (NHERI)

- Infrastructure for earthquake engineering and wind engineering research for 2015-2019
- \$62M for up to 10 awards for network coordination office, experimental facilities, cyberinfrastructure, and computational modeling and simulation tools
- Letters of Intent required by Nov. 6, 2014; proposals due by Dec. 3, 2014
- ENG contact is Joy Pauschke, CMMI

Electrical, Communications, and Cyber Systems (ECCS)



ECCS Areas of Interest

- Fundamental research issues underlying device and component technologies, power, controls, computation, networking, communications and cyber technologies
- The integration and networking of intelligent systems at the nano, micro and macro scales
 - for healthcare, homeland security, disaster mitigation, energy, telecommunications, environment, transportation, manufacturing, and other systems-related areas
- ONE submission deadline per year: Nov. 3, 2014, and Nov. 1 annually thereafter

Engineering Education and Centers

Centers and Networks

Engineering Research Centers (ERC)

Eduardo Misawa, Lead
Deborah Jackson
Carmiña Londoño
Carole Read
Keith Roper

Nanoscale Science & Engineering Centers (NSEC)

Carole Read
Keith Roper

Network for Computational Nanotechnology (NCN)

Eduardo Misawa
Keith Roper

Division Director
Theresa Maldonado
Deputy Division Director
Don Millard (acting)

Engineering Education

Research in Engineering Education (REE)
Research Initiation Grants in Engineering Education (RIGEE)
CAREER
Ethics Education in Science and Engineering (EESE)
Donna Riley

Nanotechnology Undergraduate Education (NUE) in Engineering and Computer Science

Mary Poats

Engineering Workforce Development

Research Experiences for Undergraduates

Esther Bolding

Research Experiences for Teachers

Mary Poats

Broadening Participation in Engineering

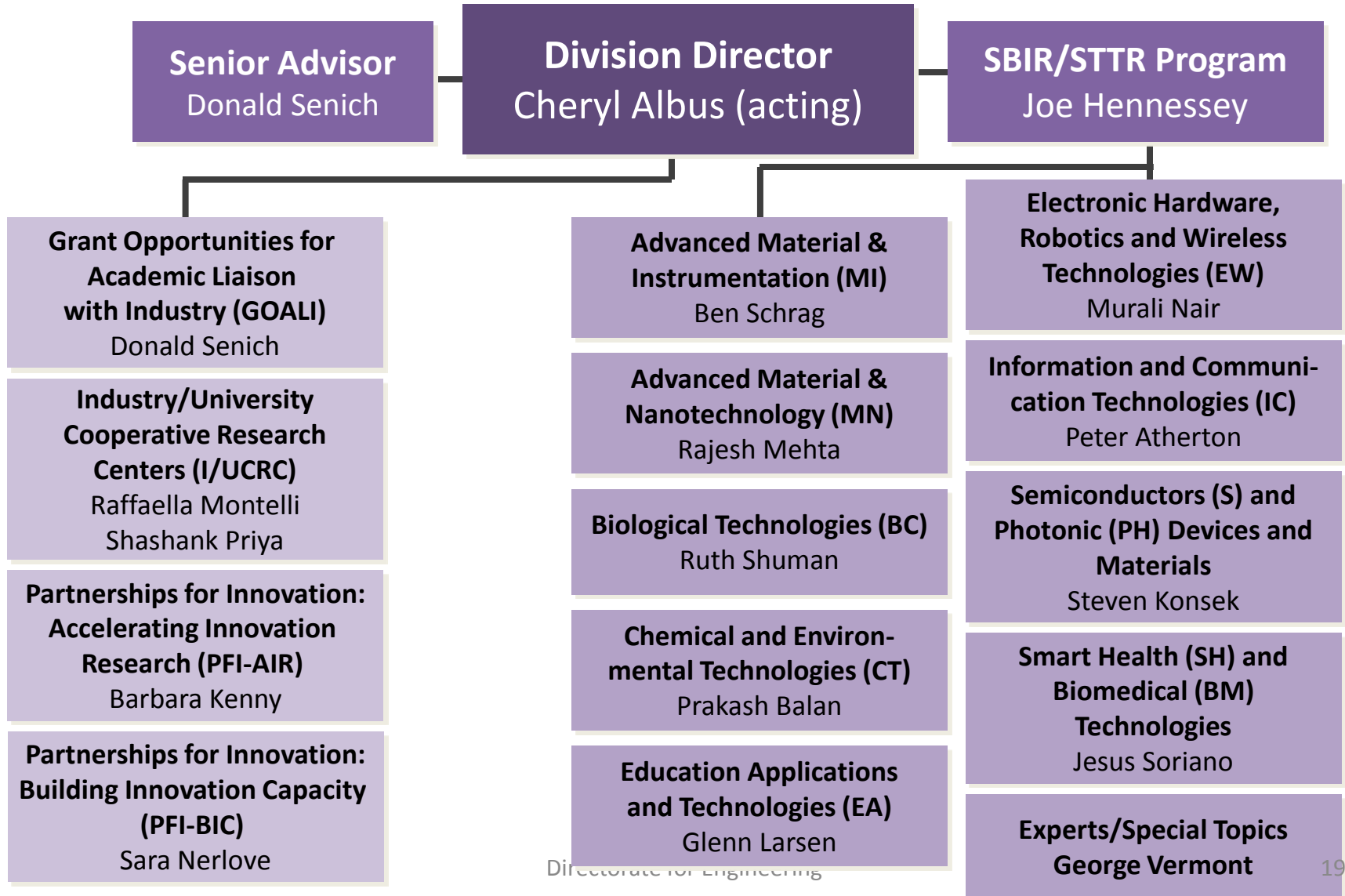
Broadening Participation Research Initiation Grant (BRIGE)

Bevlee Watford

Professional Formation of Engineers: Revolutionizing Engineering Departments (RED)

- Aims to create and support an innovative and inclusive engineering profession
- Seeks ground-breaking, significant, sustainable, and scalable ideas
- ~12M for up to 10 awards
- Letters of Intent required by Oct. 28, 2014; proposals due Nov. 26
- ENG contact is Donna Riley, EEC

Industrial Innovation and Partnerships(IIP)

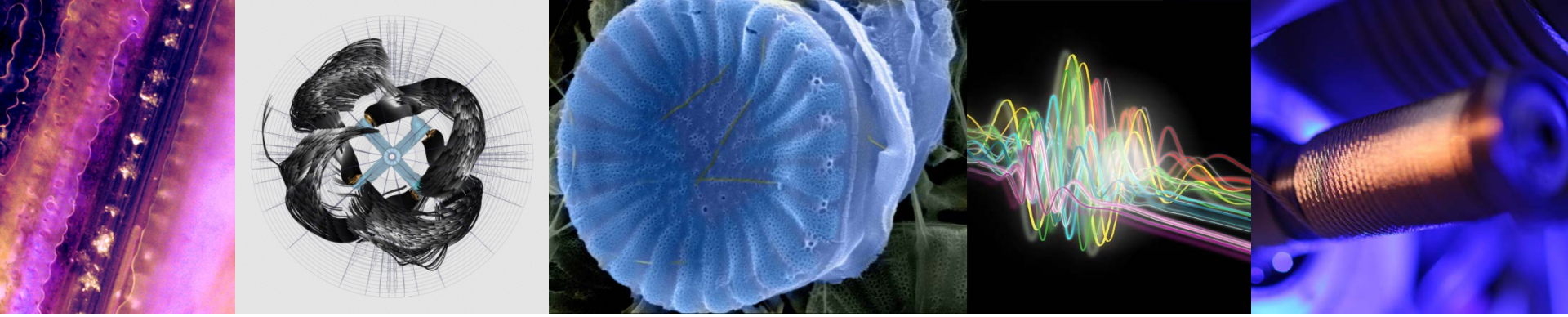


Accelerating Innovation Research (AIR)

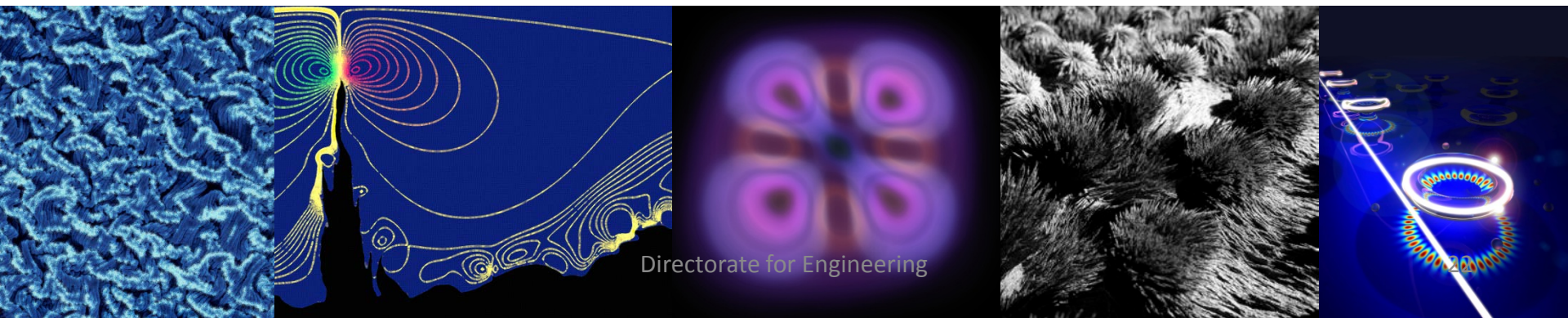
- AIR choice 1: Technology Translation (TT)
 - Proofs-of-concept and/or pre-commercial prototypes
 - Promote entrepreneurial thinking among faculty and students
 - Up to \$200K for 18 months
 - Letters of Intent due Mar. 13, 2015; proposals due Apr. 14, 2015
- AIR choice 2: Research Alliance (RA)
 - Develop innovation ecosystem
 - Stimulate entrepreneurial & innovation activities
 - Up to \$800K for 3 years
 - Third party investment required
- NSF funding lineage required

Building Innovation Capacity (BIC)

- Platform technologies to enable customer-centered and market-driven "smart" service systems
 - Potential to achieve transformational change
- Academe-industry partnerships required
 - Industry contribution of customer feedback and market knowledge to ensure relevance
 - Social behavioral and/or cognitive science component required to understand the potential interaction of the technology with customers/users
- Up to \$800k for 3 years
- Letters of Intent due Dec. 3, 2014; proposals due Jan. 28, 2015



ENG Investments and Crosscutting Programs



CAREER

- High priority for Engineering
- ENG award size increased to \$500,000
- Note: the CAREER award is not a research award, it is a career development award

Collaborative Research in Computational Neuroscience (CRCNS)

- Advances understanding of nervous system structure and function, mechanisms underlying disorders, and computational strategies used by the nervous system
- \$5-20M for up to 25 awards
- Proposals due Nov. 14, 2014
- ENG contact is Thanassis Sambanis, CBET

Designing Materials to Revolutionize and Engineer our Future (DMREF)

- Aims to build the fundamental knowledge base needed to design and make materials with specific and desired functions or properties from first principles
- \$22M investment for up to 25 awards; awards up to \$1.5M for 4 years
- Proposals due Jan. 29, 2015
- ENG contact is Alexis Lewis, CMMI

National Robotics Initiative (NRI)

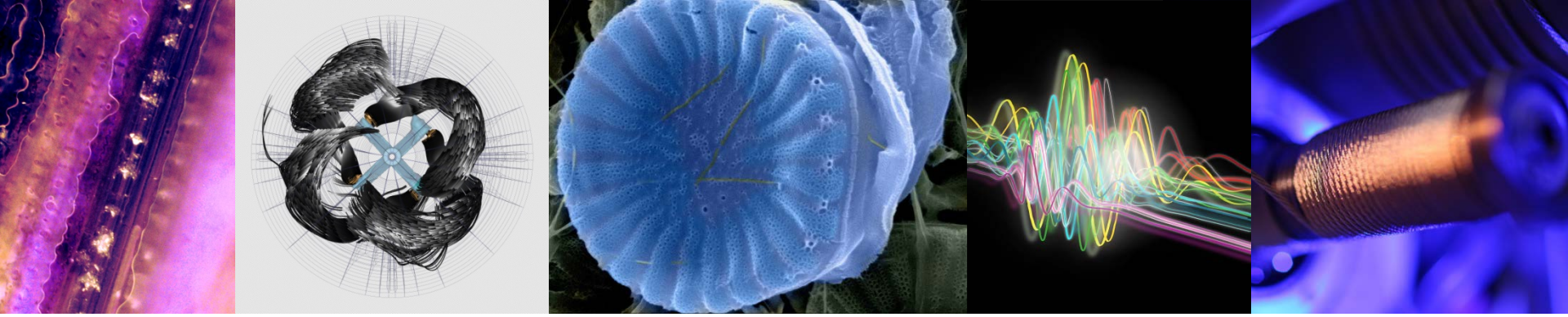
- Spurs creation of robots that that work beside, or cooperatively with, people
- ~\$30M for ~25 awards
- Proposals due Nov. 13, 2014
- ENG contact is Paul Werbos, ECCS

Secure and Trustworthy Cyberspace (SaTC)

- Multiple perspectives on cybersecurity
 - Trustworthy Computing Systems (TWC)
 - Social, Behavioral and Economic Sciences (SBE)
 - Secure, Trustworthy, Assured and Resilient Semiconductors and Systems (STARSS)
- ~\$72M for 77 awards
 - Small projects: up to 3 years, \$500K
 - Medium projects: up to 4 years, \$1.2M
 - Large projects: up to 5 years, \$3.0M
- Multiple deadlines, starting Nov. 2014
- ENG contact is Zhi (Gerry) Tian, ECCS

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- Twitter [@NSF ENG](#) and [@NSF](#) 
- Facebook <https://www.facebook.com/US.NSF> 
- www.nsf.gov



Questions

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