



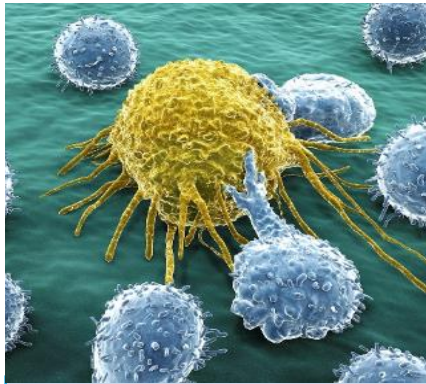
Engineering at NSF

DAWN TILBURY, NSF ASSISTANT DIRECTOR FOR ENGINEERING

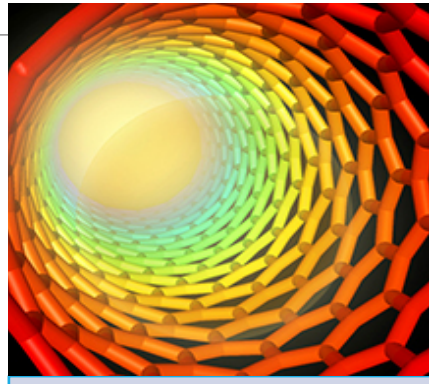
ASEE ENGINEERING DEANS INSTITUTE, NEW DEANS ORIENTATION

FEB. 3, 2020

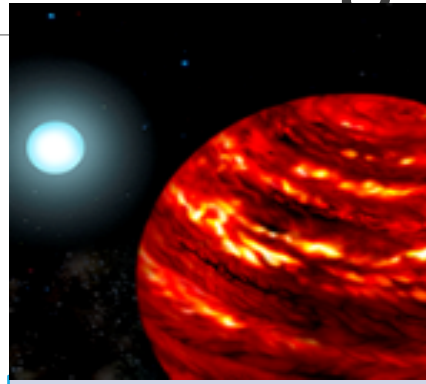
NSF champions research and education across all fields of science and engineering



Biological Sciences



Engineering



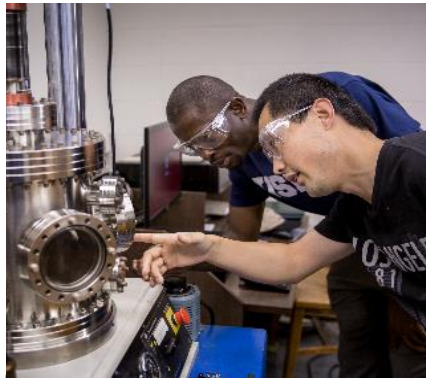
Mathematical & Physical Sciences



Computer & Information S&E



Geosciences (including Polar)



Integrative Activities



Education & Human Resources



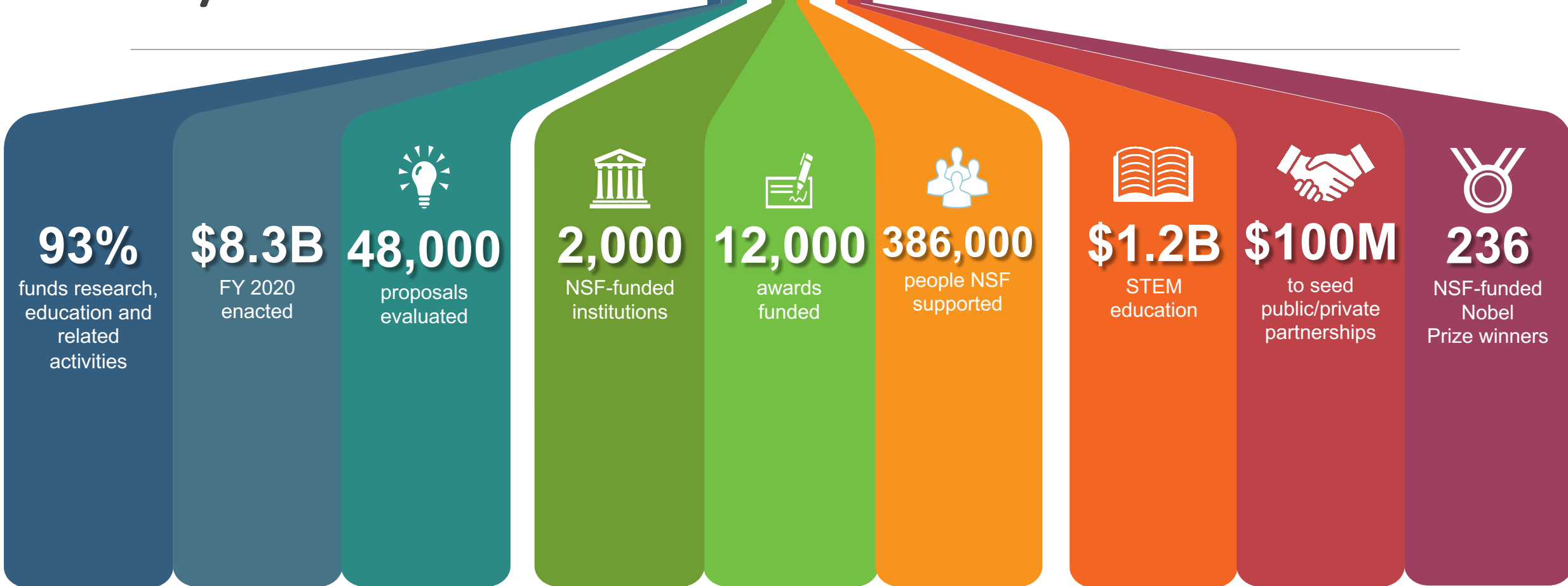
Social, Behavioral & Economic Sciences



International Science & Engineering



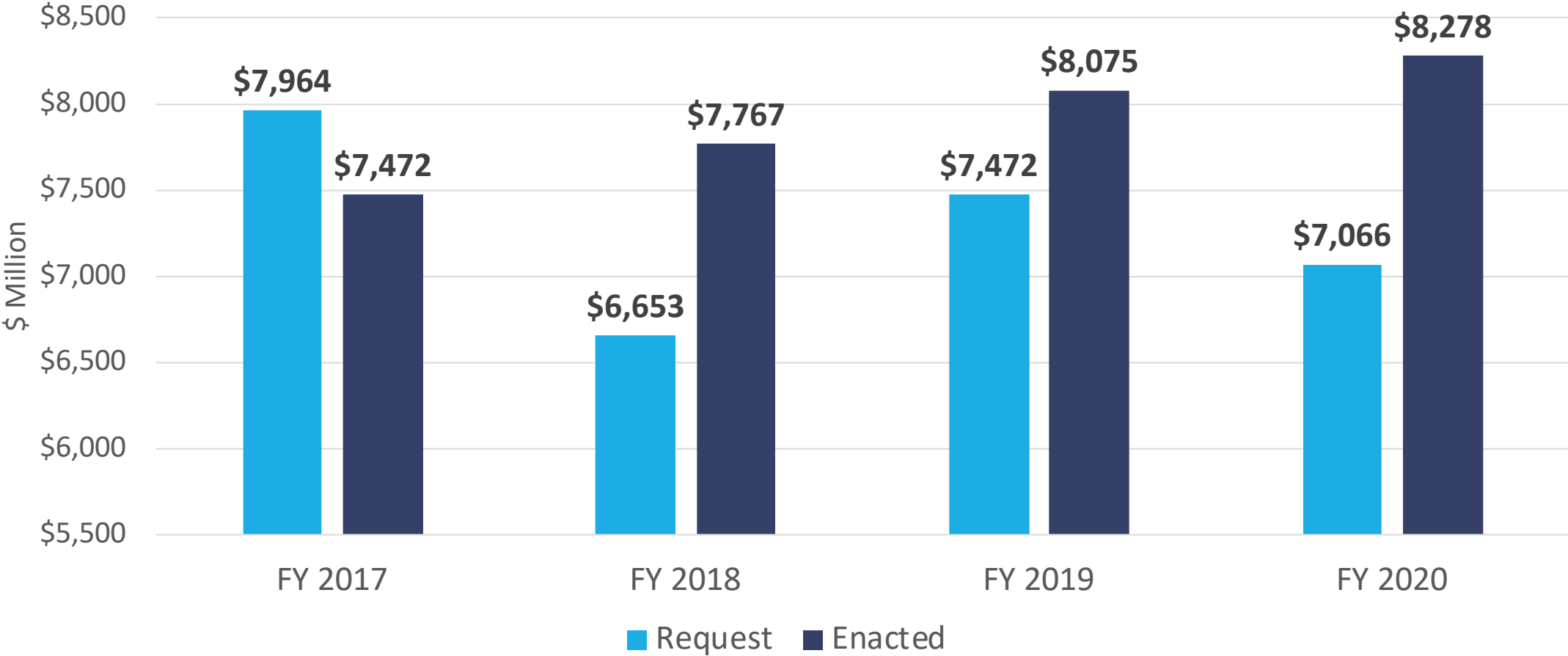
NSF by the Numbers



Numbers shown are estimates based on FY 2018 activities.



NSF Budget



Research Protection

NSF values

- Openness
- Transparency
- Merit-based competition

Importance of disclosure



The screenshot shows the NSF website header with the logo and tagline 'National Science Foundation WHERE DISCOVERIES BEGIN'. A search bar is in the top right. A navigation menu includes 'Research Areas', 'Funding', 'Awards', 'Document Library', 'News', and 'About NSF'. Below the menu, there are links for 'Home', 'Email', 'Print', and 'Share'. The main content area is titled 'NSF 19-200 Dear Colleague Letter: Research Protection' and dated 'July 11, 2019'. The letter text discusses the importance of research protection, the NSF's commitment to openness and transparency, and the risks posed by foreign government-sponsored talent recruitment programs. It mentions that NSF is taking steps to mitigate these risks and is applying consistent standards to all staff members. The letter also notes that NSF has required senior project personnel to disclose all sources of support since 1978 and is proposing an electronic format for submission of biographical sketches.



NSF's 10 Big Ideas | 6 Research Ideas

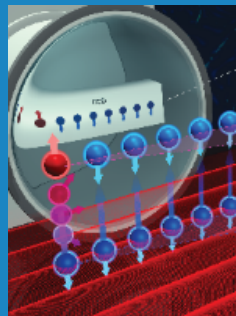


Harnessing the Data Revolution

The Future of Work at the Human-Technology Frontier



Navigating the New Arctic



The Quantum Leap: Leading the Next Quantum Revolution

Understanding the Rules of Life: Predicting Phenotype

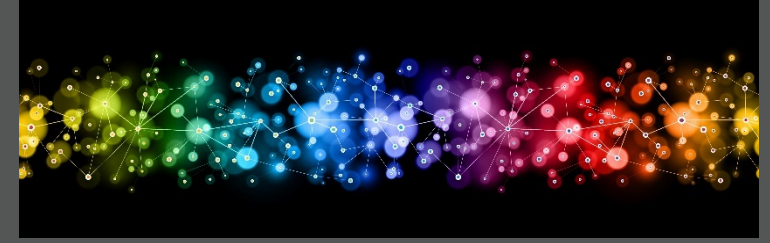


Windows on the Universe: The Era of Multi-messenger Astrophysics



NSF's 10 Big Ideas | 4 Enabling Ideas

Growing Convergence Research at NSF



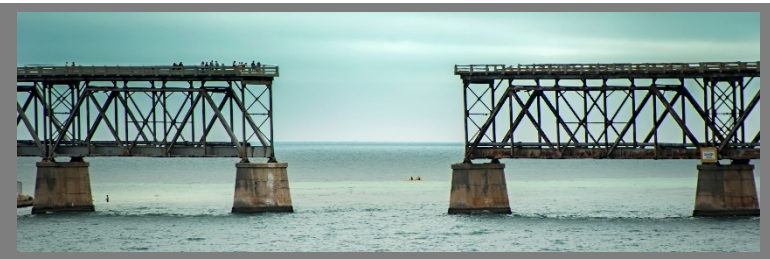
NSF 2026: Seeding Innovation



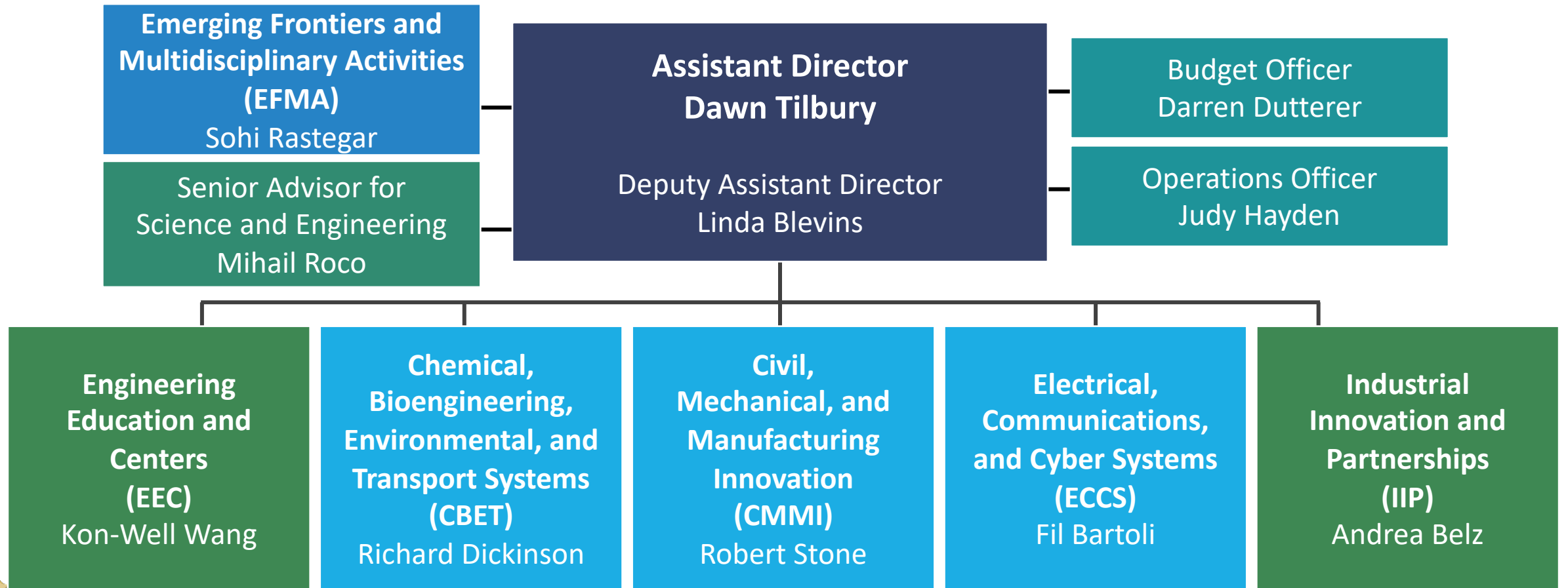
NSF INCLUDES: Enhancing STEM through Diversity and Inclusion



Mid-scale Research Infrastructure



NSF Directorate for Engineering

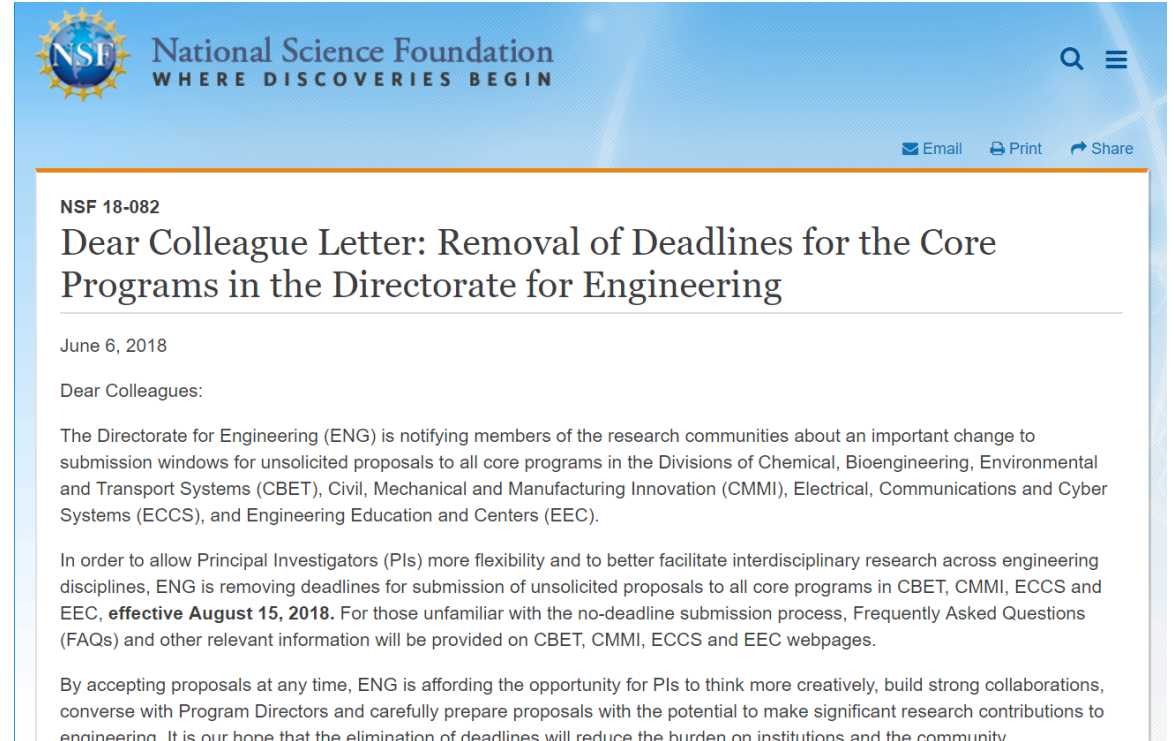


“No Deadlines” for ENG core proposals

Unsolicited proposals to all core programs in four ENG divisions (CBET, CMMI, ECCS, and EEC) are accepted any time

- Declined proposals face a 1-year moratorium before resubmission

New flexibility to carefully craft proposals for significant contributions



The screenshot shows the top of an NSF website page. The header includes the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". There are search and menu icons in the top right, and "Email", "Print", and "Share" options below. The main content area is titled "NSF 18-082 Dear Colleague Letter: Removal of Deadlines for the Core Programs in the Directorate for Engineering". The date is "June 6, 2018". The letter begins with "Dear Colleagues:" and states that the Directorate for Engineering (ENG) is notifying members of the research communities about an important change to submission windows for unsolicited proposals to all core programs in the Divisions of Chemical, Bioengineering, Environmental and Transport Systems (CBET), Civil, Mechanical and Manufacturing Innovation (CMMI), Electrical, Communications and Cyber Systems (ECCS), and Engineering Education and Centers (EEC). It further explains that in order to allow Principal Investigators (PIs) more flexibility and to better facilitate interdisciplinary research across engineering disciplines, ENG is removing deadlines for submission of unsolicited proposals to all core programs in CBET, CMMI, ECCS and EEC, effective August 15, 2018. It mentions that Frequently Asked Questions (FAQs) and other relevant information will be provided on CBET, CMMI, ECCS and EEC webpages. The letter concludes by stating that by accepting proposals at any time, ENG is affording the opportunity for PIs to think more creatively, build strong collaborations, converse with Program Directors and carefully prepare proposals with the potential to make significant research contributions to engineering. It ends with the sentence: "It is our hope that the elimination of deadlines will reduce the burden on institutions and the community."



National AI Research Institutes

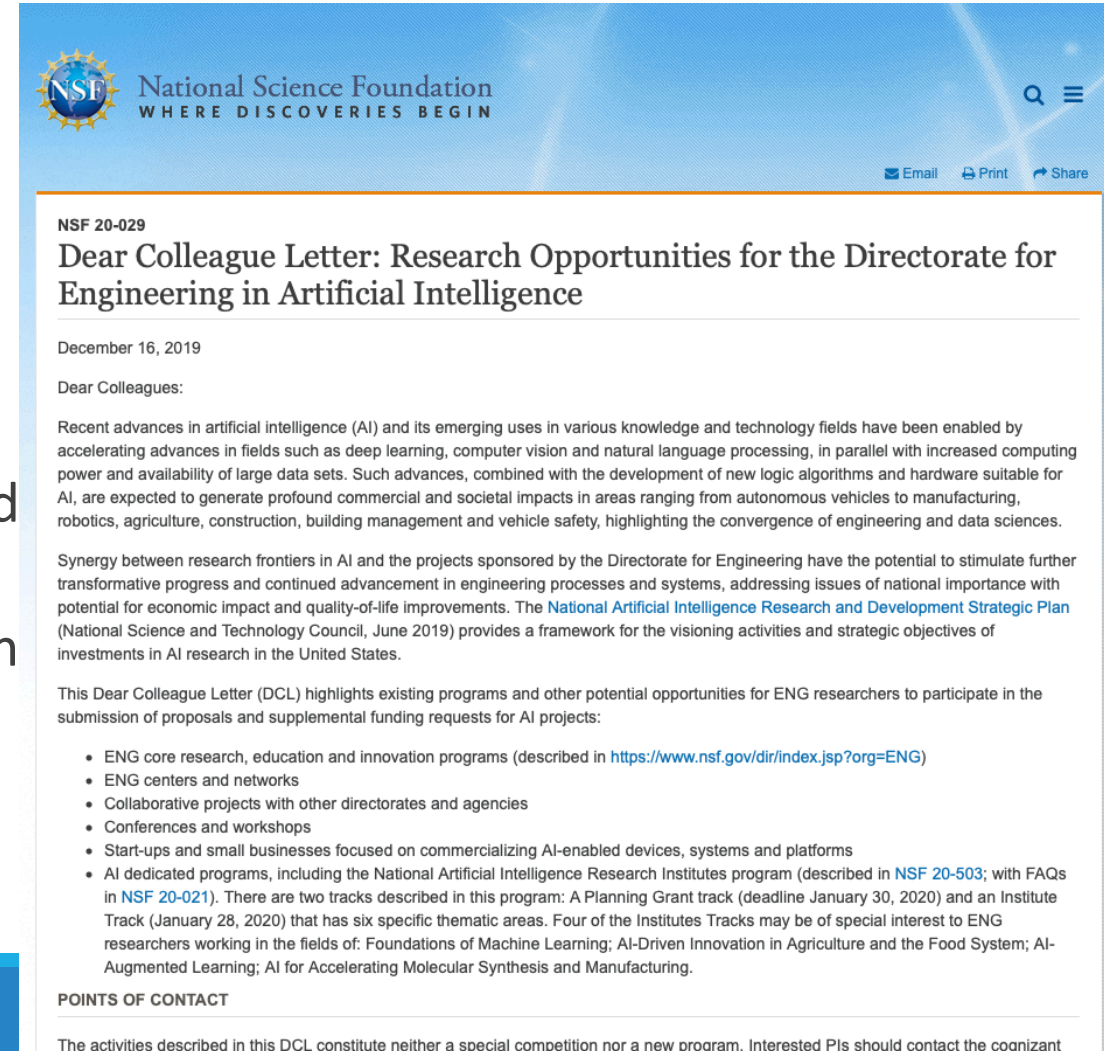
Planning grant proposals in any areas of relevant foundational and use-inspired research

Institutes proposals in a theme:

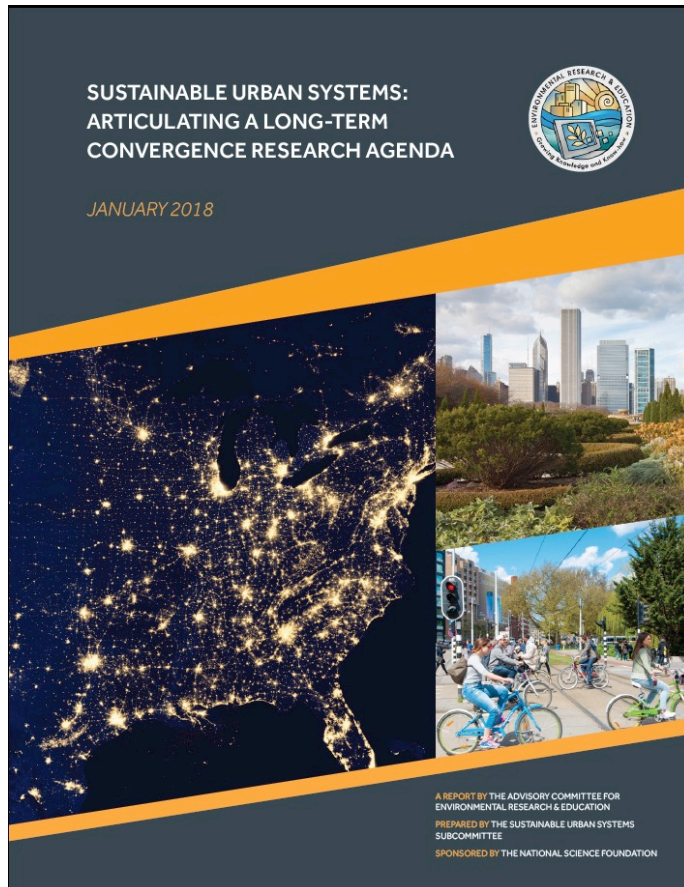
- Trustworthy AI
- Foundations of Machine Learning
- AI-Driven Innovation in Agriculture and the Food
- AI-Augmented Learning
- AI for Accelerating Molecular Synthesis and Man
- AI for Discovery in Physics

President's AI strategy:

<https://www.whitehouse.gov/ai/>

A screenshot of a webpage from the National Science Foundation (NSF) titled "Dear Colleague Letter: Research Opportunities for the Directorate for Engineering in Artificial Intelligence". The page includes the NSF logo, the text "National Science Foundation WHERE DISCOVERIES BEGIN", and navigation links for Email, Print, and Share. The main content is a letter dated December 16, 2019, addressed to "Dear Colleagues". The letter discusses recent advances in artificial intelligence (AI) and its emerging uses in various knowledge and technology fields, highlighting the convergence of engineering and data sciences. It mentions the National Artificial Intelligence Research and Development Strategic Plan (National Science and Technology Council, June 2019) and provides a list of research opportunities for ENG researchers. The list includes: ENG core research, education and innovation programs; ENG centers and networks; Collaborative projects with other directorates and agencies; Conferences and workshops; Start-ups and small businesses focused on commercializing AI-enabled devices, systems and platforms; and AI dedicated programs, including the National Artificial Intelligence Research Institutes program (described in NSF 20-503; with FAQs in NSF 20-021). The letter concludes with "POINTS OF CONTACT" and a note that the activities described in this DCL constitute neither a special competition nor a new program. Interested PIs should contact the cognizant.

Sustainable Urban Systems



27 workshops and conferences in summer 2019 to explore concepts for advancing sustainable urban systems research networks

- Small to mega cities
- Topics: food, resilience, infrastructure, automation, education, and others
- Regions: Great Lakes, Southeast, arid regions, and others

<https://www.nsf.gov/ere/ereweb/urbansystems/>

NSF AdCom for Environmental Research & Education



Mid-scale Research Opportunities

Addressing Systems Challenges through Engineering Teams (ASCENT)

Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET)

Leading Engineering for America's Prosperity, Health, and Infrastructure (LEAP HI)

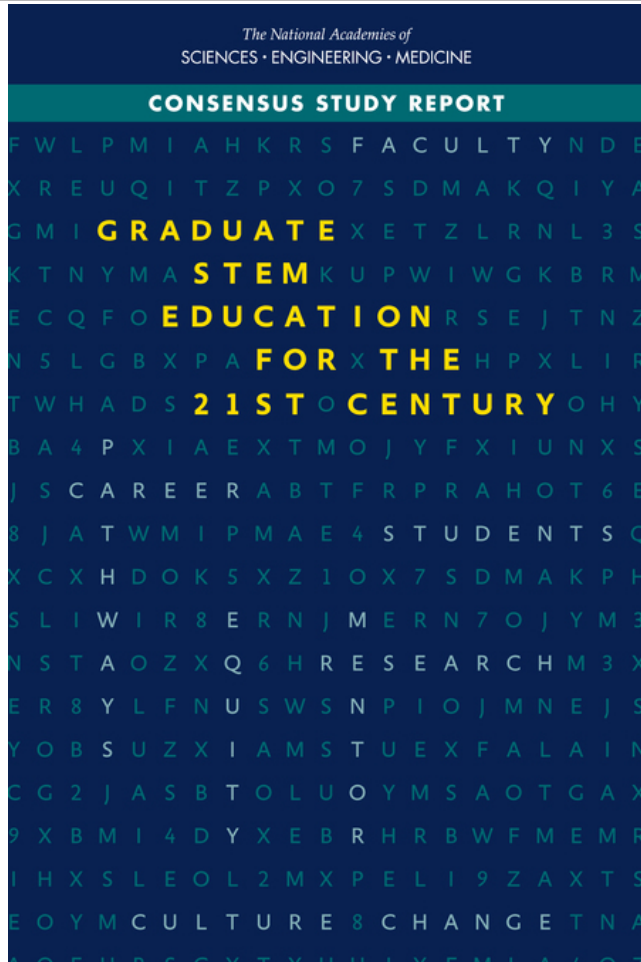


Resilient urban infrastructure that integrates the natural and built environments

Image courtesy Northwestern University



Non-Academic Research Internships for Graduate Students (INTERN) Supplements



Advances NSF-funded basic research through collaborations with industry, small businesses and national labs

- ~450 graduate students during FY 2017-2019

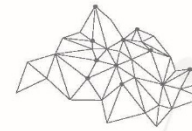


Visioning

To speak with a unified voice on bold and high-impact fundamental research priorities that will

- advance the state of current engineering endeavors, and
- enable rapid and efficient responses to emerging opportunities and/or national needs

July 2019: Visioning Summit



ENGINEERING RESEARCH
FRAMEWORK VISIONING SUMMIT

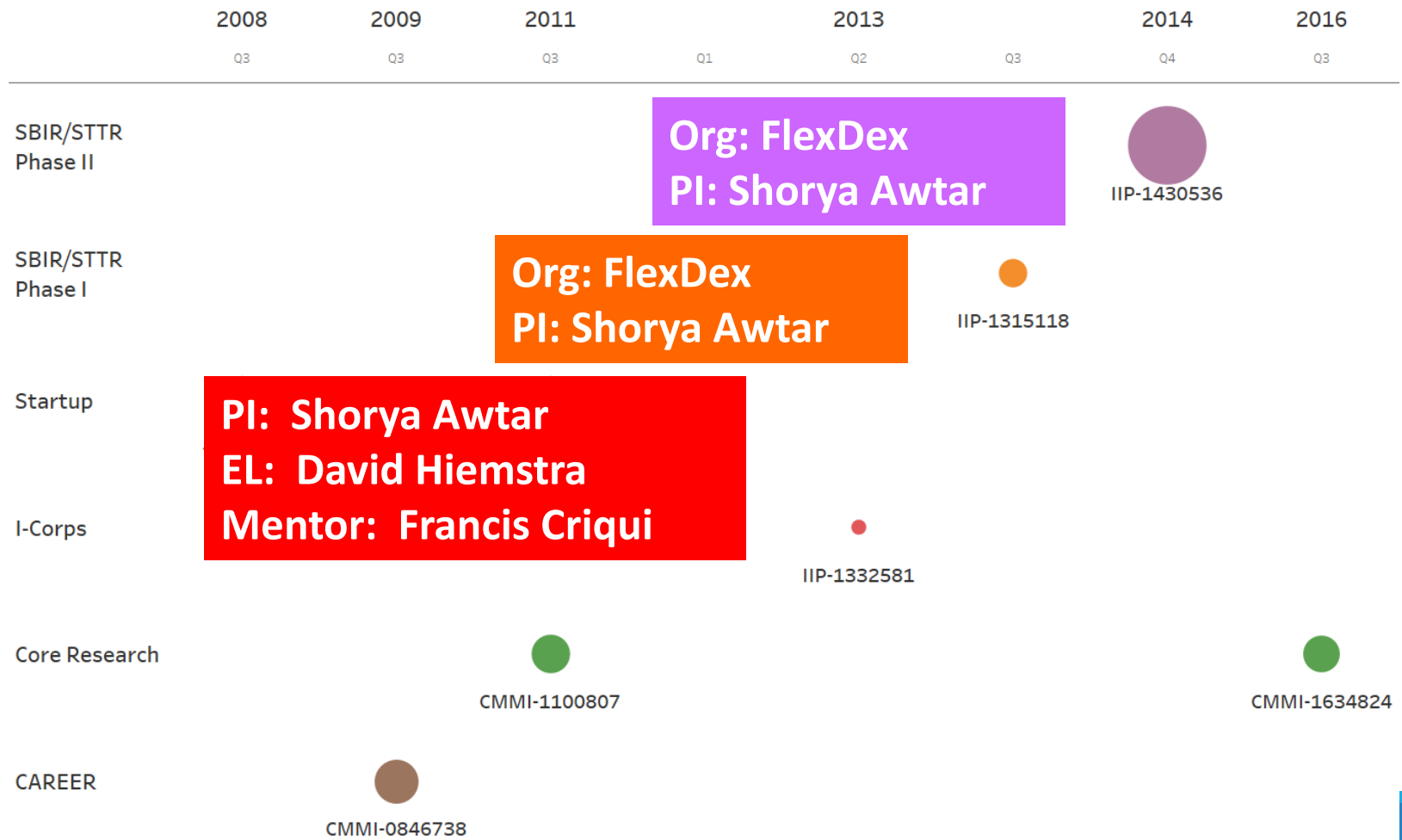


July 16 - 18, 2019
Embassy Suites, 1900 Diagonal Rd.
Alexandria, VA 22314

NSF Lineage: Basic research to commercialization



Dr. Shorya Awtar
University of Michigan
Ann Arbor



Open ENG Positions

CBET

- Disability and Rehabilitation Engineering (DARE)
- Engineering of Biomedical Systems

CMMI

- Engineering for Civil Infrastructure
- Manufacturing Systems Design

ECCS

- Communications, Circuits and Sensing Systems
- Energy, Power, Control, and Networks

EEC

- Engineering Research Centers

<http://nsf.gov/careers>



Thank you

