Opening Remarks
NAE Grand Challenges Scholars Program

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Create the future

NSF supports discovery and education to create a future where people thrive.

Engineers are making this future a reality through research in areas such as advanced manufacturing, health care, sustainability, infrastructure, and more.

Image credit: Rob Felt
Innovate for prosperity

NSF-funded engineering researchers create new knowledge, concepts, and designs that become technological breakthroughs and solve real-world problems. They create innovations for clean water, the electric grid, agriculture, and to address other national challenges.

To speed innovations to the market, NSF also spurs entrepreneurship, small business growth, and industry collaboration.
Educate the future workforce

To prepare an inclusive, innovative workforce that can meet the changing needs of the US economy, NSF supports advances in engineering education and introduces the exciting possibilities of engineering to the next generation.
NSF FY 2017 Budget (Enacted, $M)

NSF Total $7,472
ENG Total $930

- ENG - other than SBIR
- ENG - SBIR
- NSF - other than ENG
FY 2018 Budget Request

NSF FY 2018 Budget Proposals
(% change from FY 2017 Enacted)

National Science Foundation Total
-11%

Research (R&RA)
-11%

Education (EHR)
-14%

Facilities Construction (MREFC)
-63%

Source: American Institute of Physics / www.aip.org/fyi
NSF Big Ideas for Future NSF Investments

**RESEARCH IDEAS**

- Harnessing Data for 21st Century Science and Engineering
- Work at the Human-Technology Frontier: Shaping the Future
- Windows on the Universe: The Era of Multi-messenger Astrophysics
- The Quantum Leap: Leading the Next Quantum Revolution
- Understanding the Rules of Life: Predicting Phenotype

**PROCESS IDEAS**

- Mid-scale Research Infrastructure
- NSF 2026
- Growing Convergent Research at NSF
- NSF INCLUDES: Enhancing STEM through Diversity and Inclusion
NSF INCLUDES

SEPT. 2016
Awards for 37 Design and Development Launch Pilots
DCL for NSF INCLUDES EAGERs, supplements and conferences
JULY 2017

SEPT. 2017
Awards for 27 Design and Development Launch Pilots
Workshop for NSF INCLUDES grantees and NSF centers
JAN. 2018
Engineering Research Centers take on complex research challenges

ERCs focus cutting-edge researchers from multiple fields to discover and launch ubiquitous future technologies

- Translate discoveries into innovations
- Strengthen U.S. competitiveness
- Prepare next generation of technological leaders
14 Generation-3 ERCs in FY 2018

4 new ERCs awarded in FY17

- Innovative and Strategic Transformation of Alkane Resources, *Purdue University*
- Cell Manufacturing Technologies, *Georgia Tech*
- Cellular Metamaterials, *Boston University*
- Precise Advanced Technologies and Health Systems for Underserved Populations, *Texas A&M University*
A New Vision for Center-Based Engineering Research

May 2017: National Academies report
Summer 2017: Working group
October 2017: ENG AdCom discussion
November 3, 2017: Workshop
Spring 2018: Solicitation for GEN-4 ERC
Innovation Corps spurs entrepreneurship

Trains teams of faculty, students/postdocs, and business mentors

Translates NSF discoveries into new technologies

Involves people across NSF

Since 2011:
• 1000+ teams
• 50+ cohorts
• 360+ startups
NSF Responds to Hurricanes Harvey, Irma, and Maria

- Deadline extensions
- Mobilization of Geotechnical Extreme Events Reconnaissance (GEER) Association and Natural Hazards Engineering Research Infrastructure (NHERI) teams
- Funding of Rapid Response Research (RAPID), Early-concept Grants for Exploratory Research (EAGER) and supplements
- https://nsf.gov/naturaldisasters/
Burgeoning US Undergraduate Enrollment in Engineering

Nearly 77% growth in 10 years!

Data courtesy ASEE
Strategic Challenges and Opportunities

Struggling with diversity and inclusion despite increasing enrollment; uneven distribution across engineering disciplines

Flat or decreasing budgets
- Leading Engineering for America's Prosperity, Health and Infrastructure (LEAP HI)
- Partnerships
  - Industry (SRC, IUCRC, and other IIP programs)
  - Government (INFEWS USDA/NIFA, AFOSR, I-Corps)
  - International (Ireland, UK, China, Israel; CASIS)