Engineering for Civil Infrastructure (ECI) Program Informational Webinar

Program Directors:

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May 11, 2020

Webinar Outline

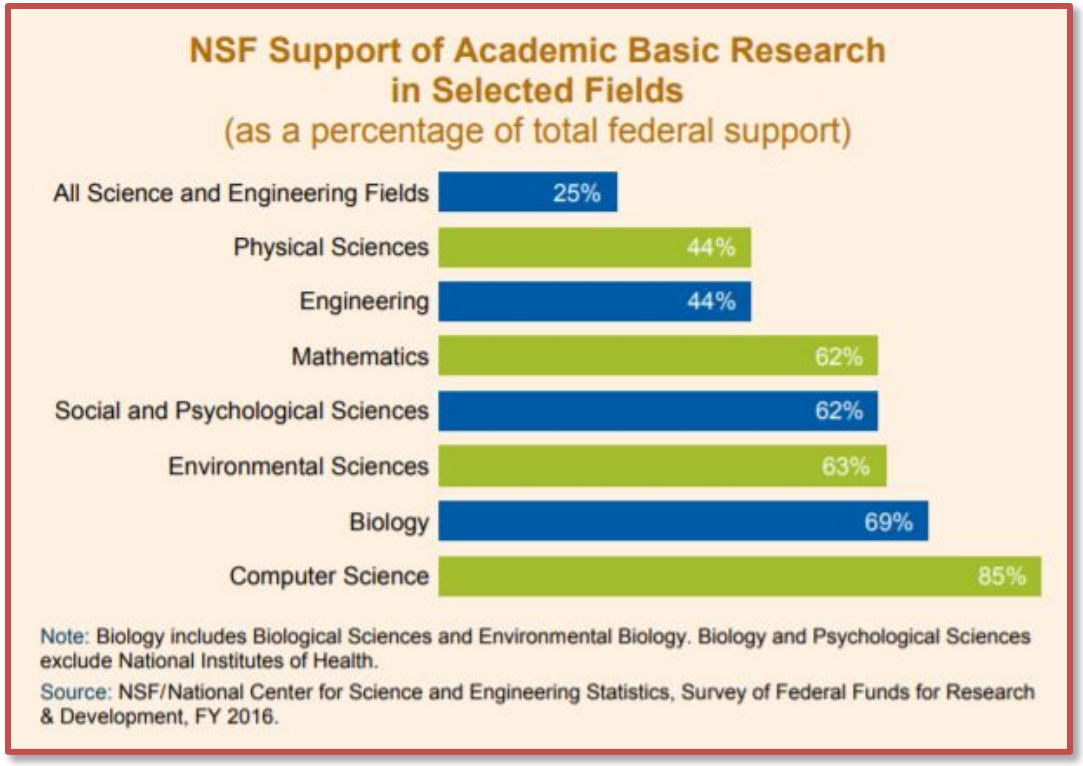
- Reminders
  - Webinar is being recorded.
  - Please use the Q&A box for submitting questions.
  - Do not use the Chat feature.
  - Webinar recording and these slides will be available at the ECI home page in about two weeks after this webinar.

- Overviews
  - National Science Foundation
  - Engineering for Civil Infrastructure Program
  - Natural Hazards Engineering Research Infrastructure

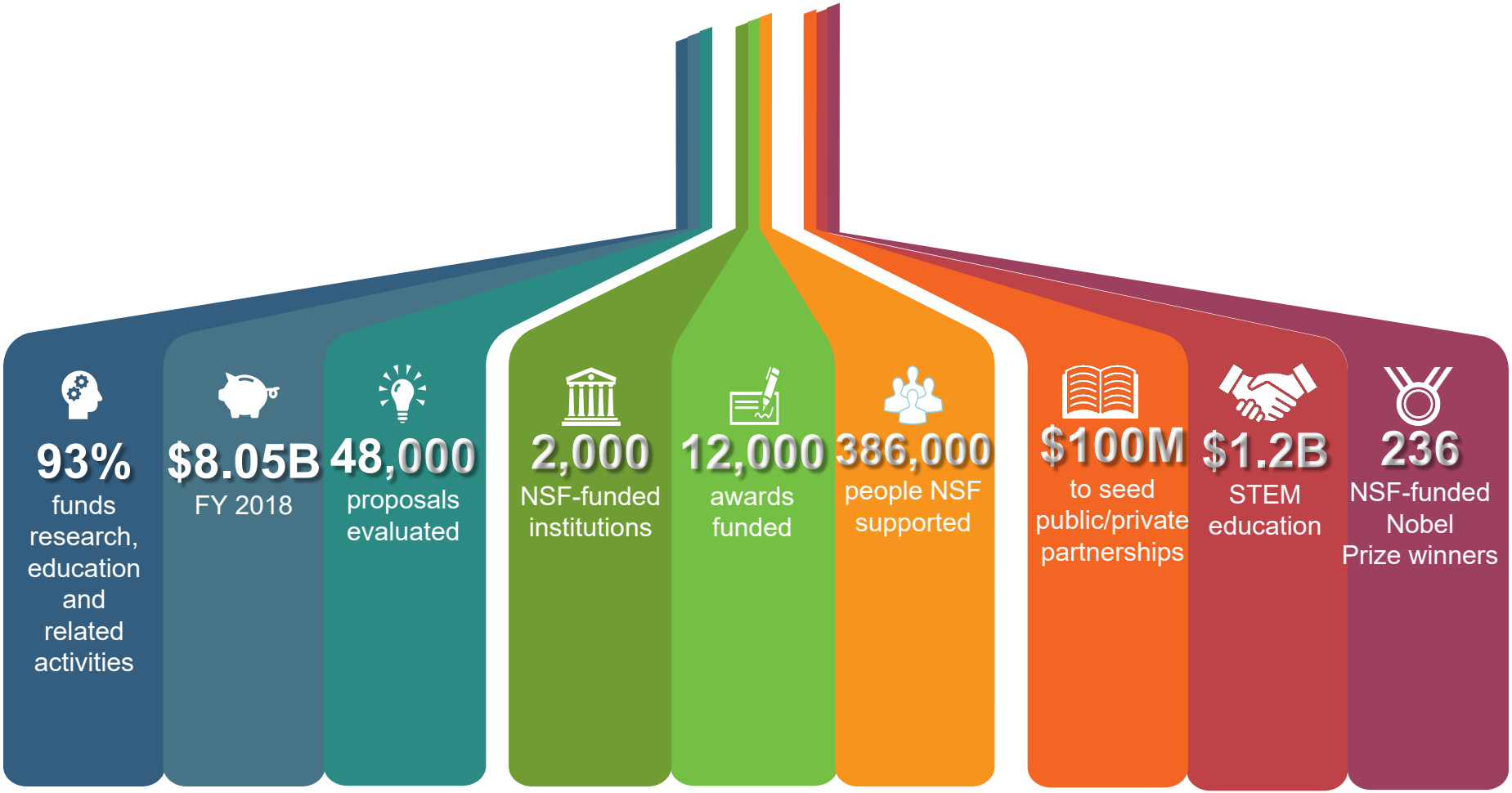
- Question and Answer (Q&A) session

What NSF Does

- Supports all fields of fundamental science and engineering, except for medical sciences.
- Ensures that research is integrated with education so that today's revolutionary work will enable training of tomorrow's top scientists and engineers.

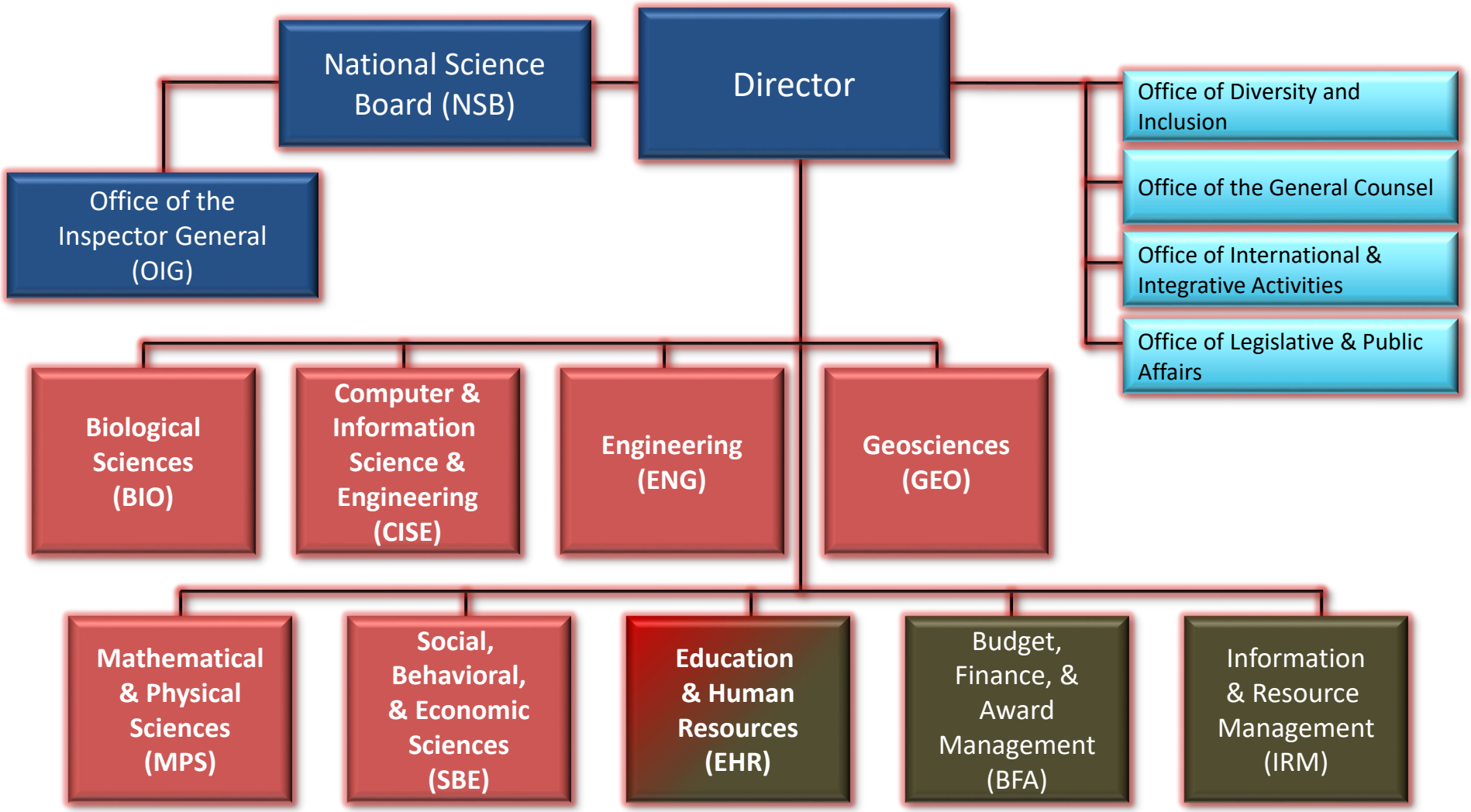


NSF By the Numbers

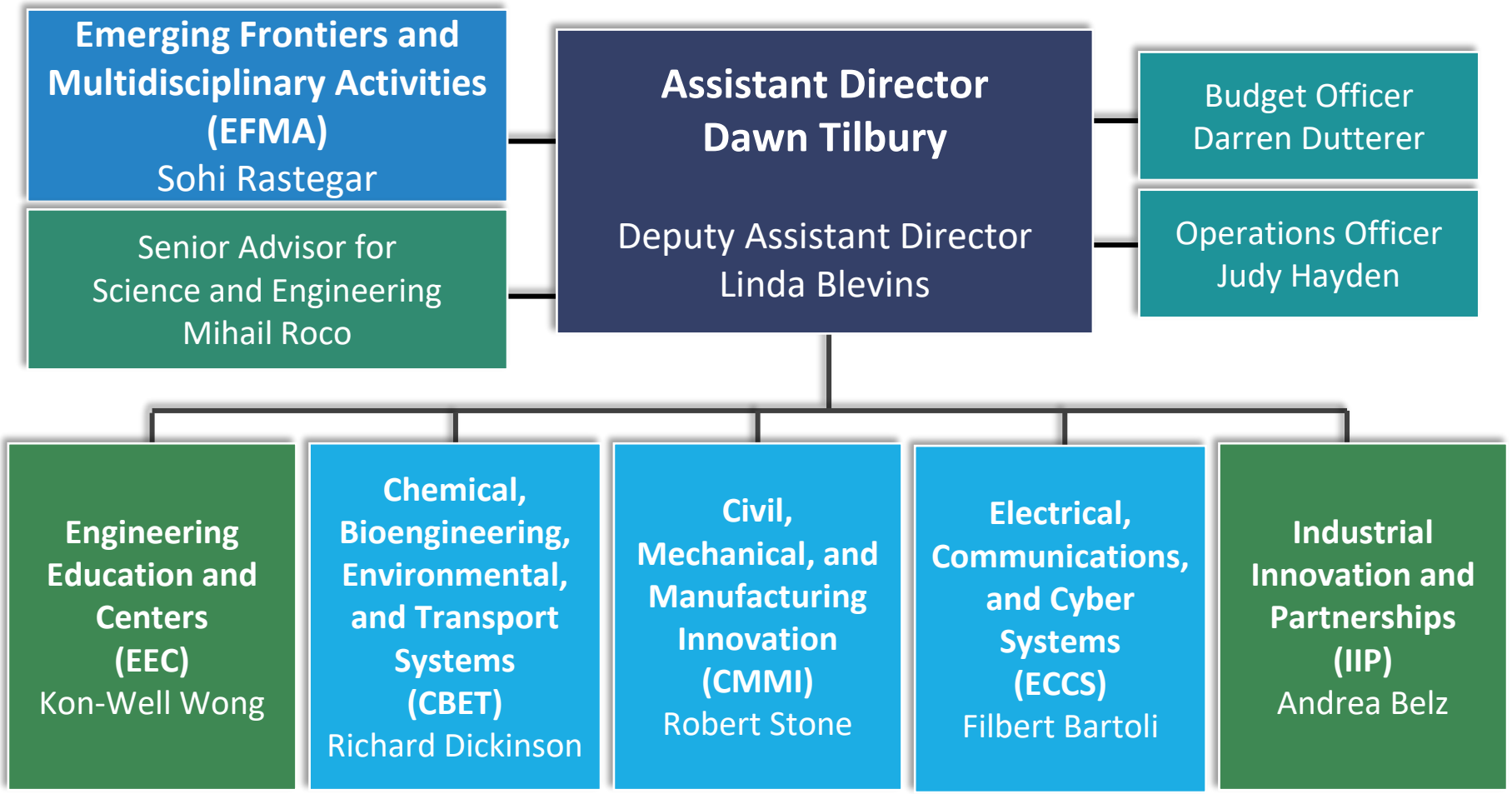


Numbers shown are estimates based on FY 2018 activities.

NSF Organization



Directorate for Engineering (ENG)



Civil, Mechanical and Manufacturing Innovation

Deputy Division Director
Mary Toney

Division Director
Rob Stone

Senior Advisor
Bruce Kramer

S&T Advisor
Jack Meszaros

Data Infrastructure
Alexis Lewis

Integrative Activities
Jo Culbertson

Advanced Manufacturing

Advanced Manufacturing Program

Khershed Cooper
Kevin Chou
Bruce Kramer
Tom Kuech
Andrew Wells

Dynamics, Control and Cognition

Dynamics Control and Systems Diagnostics
Jordan Berg
Irina Dolinskaya
Robert Landers

Mind, Machine, Motor Nexus
Robert Scheidt

Mechanics and Engineering Materials

Biomechanics and Mechanobiology
Laurel Kuxhaus

Mechanics of Materials and Structures
Nakhiah Goulbourne
Siddiq Qidwai

Operations and Design

Civil Infrastructure Systems
Yueyue Fan

Humans, Disasters, and the Built Environment
Walter Peacock

Engineering Design & Systems Engineering
Katherine Jablokow

Operations Engineering
Georgia-Ann Klutke

Resilient and Sustainable Infrastructures

Engineering for Civil Infrastructure
Çağlar Oskay
Joy Pauschke
Future PD

Natural Hazards Engineering Research Infrastructure
Joy Pauschke

Leading Engineering for American Prosperity, Health, and Infrastructure
Bruce Kramer

Resilient and Sustainable Infrastructures (RSI) Cluster

Innovation to advance resilience and sustainability of civil infrastructure

RSI Cluster

- Engineering for Civil Infrastructure (ECI) Program
- Natural Hazards Engineering Research Infrastructure (NHERI)

Program Directors

Caglar Oskay

Joy Pauschke

Program synopsis:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505488

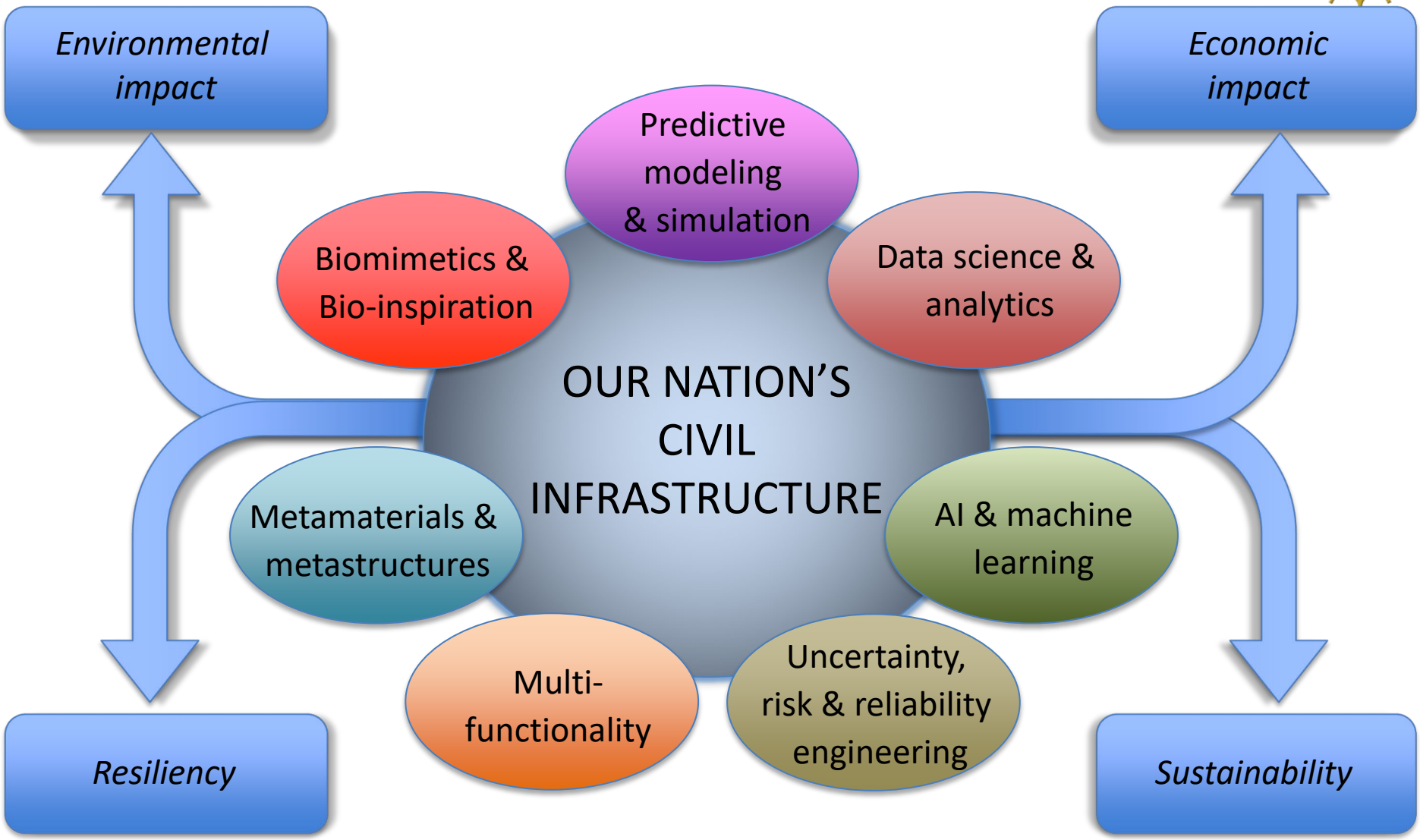
Engineering for Civil Infrastructure Program

Supports fundamental research in infrastructure materials and architectural, geotechnical and structural engineering that can shape the future of the nation's civil infrastructure

- **Research focus areas:**
  - **Geomaterials and geo-structures**
  - **Structural materials (metallic, polymeric, cementitious, glass, composites, etc.)**
  - **Structural and non-structural systems**
  - **Building envelopes**
- **Physical infrastructure subjected to or interacting with**
  - **Natural environment during construction**
  - **"Normal" service conditions**
  - **Severe loading and environmental conditions**
  - **Extreme single or multiple events (e.g., earthquakes, windstorms, tsunamis, storm surges, sinkholes, subsidence, and landslides)**

Background image: www.mckinsey.com

ECI Priority Areas

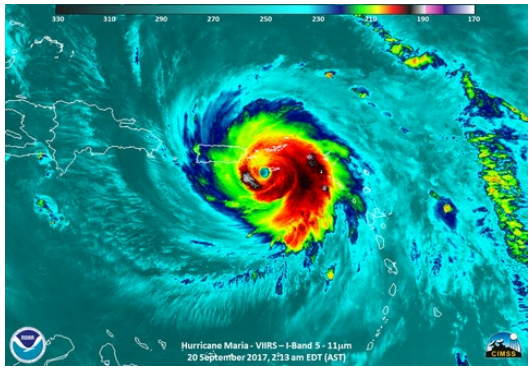


ECI Program Considerations

Image from NWIRP website

- Disciplinary or cross-disciplinary research
- Single PI or multiple PI teams
- Contributions to:
  - National Earthquake Hazards Reduction Program (NEHRP)
  - National Windstorm Impact Reduction Program (NWIRP)

Image from NWIRP website



- Leverage Natural Hazards Engineering Research Infrastructure (NHERI)
  - Experimental facilities
  - Computational modeling and simulation tools
  - Data resources and DesignSafe cyberinfrastructure
- NHERI Five-Year Science Plan

Images from NEHRP website

Research Topics not Supported by ECI

- Research that *lacks grounding in theory*;
- Research that is *not fundamental*;
- Research that is *not focused on civil infrastructure*;
- Research on *mission agency responsibilities*;
  - Nuclear power plants (e.g., foundations, design, materials)
  - Energy-related infrastructures (e.g., wind farms; offshore drilling platforms; power and transmission lines, including towers)
  - Transportation infrastructure (e.g., bridges, roadways, pavements, waterways)
- *Hazard characterization for and mitigation of impact of explosions, fire or blast loading*;
- *Sensor and measurement technologies*;
  - Advancing imaging techniques and diagnostics, remote sensing techniques
- *Natural hazard characterization* (consult Geosciences directorate)

Rapid Response Research (RAPID) Proposals

For proposals having a severe urgency with regards to availability of or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events.

- Only internal merit review required
- PIs must contact NSF Program Officer before proposal submission
- Email documentation from at least one NSF Program Officer confirming approval to submit a RAPID proposal must be uploaded in proposal as a document entitled "RAPID – Program Officer Concurrence Email" in the Supplementary Documentation section of FastLane
- Support up to one year and up to $200K
- RAPID proposals should address:
  - Perishable data collection or other urgency
  - Research questions/hypotheses and expected research outcomes
  - Contributions to advance basic knowledge

EArly Grants for Exploratory Research (EAGER) Proposals

Supports exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. This work may be considered especially "high risk-high payoff" in the sense that it, for example, involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives.

- Only internal merit review required
- PIs must contact NSF Program Officer before proposal submission
- Email documentation from at least one Program Officer confirming approval to submit an EAGER proposal must be uploaded in proposal as a document entitled “EAGER – Program Officer Concurrence Email" in the Supplementary Documentation section of FastLane
- Support up to two years and up to $300K
- EAGER proposals are NOT:
  - for projects that are appropriate for submission as "regular" NSF proposals;
  - for planning grants;
  - to support the collection of preliminary data; or
  - to provide services to NSF.

Natural Hazards Engineering Research Infrastructure (NHERI) https://www.DesignSafe-ci.org

NHERI Natural Hazards Engineering Research Infrastructure

PURDUE UNIVERSITY
Network Coordination Office
NSF Award #1612144

UNIVERSITY OF COLORADO BOULDER
Extreme Event Reconnaissance Coordination
NSF Award #1841338

UC BERKELEY
Computational Simulation
NSF Award #1612843

UNIVERSITY OF WASHINGTON
Natural Hazards Reconnaissance Equipment
NSF Award # 1611820

UNIVERSITY OF TEXAS, AUSTIN
Community Cyberinfrastructure
NSF Award #1520817

OREGON STATE UNIVERSITY
Wave Basin and Flume
NSF Award # 1519679

FLORIDA INTERNATIONAL UNIVERSITY
Wind Simulation
NSF Award #1520853

UNIVERSITY OF TEXAS, AUSTIN
Mobile Field Shakers
NSF Award #1520808

UNIVERSITY OF FLORIDA
Wind Simulation
NSF Award #1520843

UC DAVIS
Geotechnical Centrifuges
NSF Award #1520581

LEHIGH UNIVERSITY
Hybrid Simulation
NSF Award #1520765

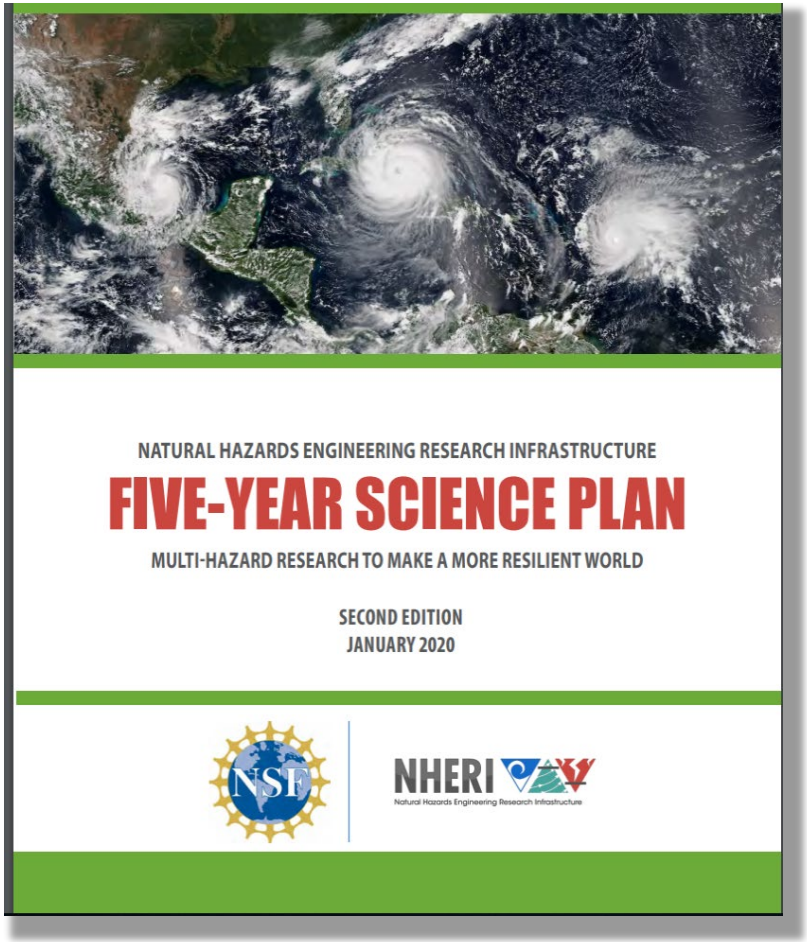
UC SAN DIEGO
Large Outdoor Shake Table
NSF Award #1520904

$16.3M upgrade from 1 DOF to 6DOF in progress, to be completed spring 2021

Graphics courtesy of Julio Ramirez, Purdue University

NHERI Science Plan

https://www.designsafe-ci.org/facilities/nco/science-plan/



Grand Challenge subject areas:

1. Identify and quantify the characteristics of earthquake, windstorm, and associated hazards — including tsunamis, storm surge, and waves — that are damaging to civil infrastructure and disruptive to communities.
2. Evaluate the physical vulnerability of civil infrastructure and the social vulnerability of populations in communities exposed to earthquakes, windstorms, and associated hazards.
3. Create the technologies and engineering tools to design, construct, retrofit, and operate a multi-hazard resilient and sustainable infrastructure for the nation."

Engineering for Civil Infrastructure Program

Program Description

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505488

Due Date

Full proposal accepted anytime

Submit proposal to PD 19-073Y

Read program description

Write proposal to PD 19-073Y scope

If proposal that does not fit program, it is either

- returned without review, or
- transferred to another program (with PI approval)

NSF Resources for Proposal Submission

Proposal submitted to core ENG programs (including ECI) must follow the NSF PAPPG in effect at the time of proposal submission.

NSF Proposal and Award Policies and Procedures Guide PAPPG

NSF 19-1 prior to June 1, 2020 https://www.nsf.gov/pubs/policydocs/pappg19_1/index.jsp

NSF 20-1 on/after June 1, 2020 https://www.nsf.gov/pubs/policydocs/pappg20_1/index.jsp

NSF Merit Review Process

https://www.nsf.gov/bfa/dias/policy/merit_review/

Engineering Directorate Removal of Core Program Proposal Deadlines

- Removal of Deadlines for Core ENG Programs https://www.nsf.gov/pubs/2018/nsf18082/nsf18082.jsp
- FAQ on Removal of Deadlines https://www.nsf.gov/pubs/2018/nsf18083/nsf18083.jsp

CMMI Guidelines for Research Experiences for Undergraduates (REU) Supplements (Oct 1, 2020 – May 1, 2020)

https://www.nsf.gov/news/news_summ.jsp?cntn_id=138772

Faculty Early Career Development (CAREER) Program (Deadline: July 27, 2020)

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503214

Q & A

Please use the Q&A box for submitting questions.

Do not use the Chat feature.

Webinar recording will be available at the ECI home page within two weeks after webinar.

- Who should I contact if I have a question about the ECI program?
- How do I know if my topic fits the ECI program?
- What is a typical budget for an ECI award?
- When can I submit a proposal to the ECI program?
- How long will it take NSF to review and make a decision on my proposal?
- Is there a “best time” to submit a proposal to ECI?
- What is the timeline of the merit review process?
- Can I resubmit a declined proposal right away?
- Is there a limit to how many proposals I can have pending at the same time as a PI or co-PI?

Q & A

Who should I contact if I have a question about the ECI program?

You can send an e-mail to all Program Directors at: ECI@nsf.gov or any one of the Program Directors. We work closely together and one of us will respond to your question.

How do I know if my topic fits the ECI program?

Review the ECI program synopsis. Send email to ECI@nsf.gov with no more than a one-page summary of your proposed topic.

What is a typical budget for an ECI award?

The budget should be commensurate with the scope. The ECI program does not have a floor or ceiling for the budget.

Q & A

When can I submit a proposal to the ECI program?

ECI accepts proposals at any time throughout the year.

How long will it take NSF to review and make a decision on my proposal?

Merit review process **takes approximately six months**. Large or particularly complex proposals may require additional review and processing time.

Is there a "best time" to submit a proposal to ECI?

The ECI program reviews proposals on an ongoing basis. **There is no best time.** PIs should pick a date when they would like a decision made on their proposal, and then back-up that date by six months to determine the proposal submission date. For example, a PI would like a decision by approximately March, then the PI should consider submitting the proposal by September of the previous year.

Q & A

What is the timeline of the merit review process?

https://www.nsf.gov/bfa/dias/policy/merit_review/

Q & A

Will ECI support research on highway or railway/highway bridges, roadways, pavements, waterways, or other transportation infrastructure components?

No, the ECI program description states that the program does not support any research for transportation infrastructure.

Will ECI support research on wind turbines and wind farms?

No, the ECI program description states that the program does not support any research for energy-related infrastructure.

Will ECI support offshore structures?

Depends on the type of offshore structure. For example, the ECI program description states that the program does not support any research for energy-related infrastructure, e.g., offshore oil drilling platforms and offshore windfarms.

Q & A

I have two unfunded collaborators that will contribute to my proposal and have asked them each to write a letter of collaboration. Each letter has three paragraphs that describe in detail the work that the collaborator will do. Can these letters be included in the proposal?

- No, letters from unfunded collaborators MUST follow the format given in the Proposal and Award Policies and Procedures Guide for letters of collaboration in Chapter II:

  "If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal."

- Letters of support are NOT permitted for proposals submitted to core programs.

Q & A

Can I resubmit a declined proposal right away?

No. A declined proposal may be resubmitted only after:

1. it has undergone *substantial revision, as determined by the cognizant NSF Program Director,* **AND**
2. *After 12 months has passed from the previous date of submission.*

Any proposal that is a duplicate of, or substantially similar to, a previous proposal that is under the moratorium period will be returned without review. A revised proposal must abide by the 12-month moratorium even if it is submitted to a different program in the Engineering Directorate.

Is there a limit to how many proposals I can have pending at the same time as a PI or co-PI?

There is no limit to the number of pending proposals a PI or co-PI can have within the Engineering Directorate at any given time. However, each proposal must be ***significantly different*** from the others pending at NSF in order to be considered for review. A proposal that is a duplicate of, or substantially similar to, a pending proposal at NSF will be returned without review.

Q & A

Please use the **Q&A** box for submitting questions.

Do not use the Chat feature.