

Broadening Participation in Engineering (BPE)



Overview of Programming and Solicitation: NSF 22-514

NSF – ENGINEERING DIRECTORATE

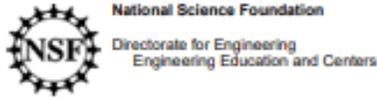
ENGINEERING EDUCATION AND CENTERS (EEC)

CHRISTINE GRANT, PH.D., BPE PROGRAM OFFICER

Broadening Participation in Engineering (BPE)

PROGRAM SOLICITATION NSF 22-514

REPLACES DOCUMENT(S):
PD 19-7680



Letter of Intent Due Date(s) (optional) (due by 5 p.m. submitter's local time):

December 03, 2021
September 21, 2022
Third Wednesday in September, Annually Thereafter

LOIs are strongly recommended for Track 4.

Full Proposal Target Date(s):

January 28, 2022
November 16, 2022
Third Wednesday in November, Annually Thereafter

These target dates are for BPE proposals submitted to Tracks 3 and 4 ONLY. Proposals will be accepted at ANYTIME for BPE Tracks 1 and 2.

IMPORTANT INFORMATION AND REVISION NOTES

- This solicitation builds upon the prior Broadening Participation in Engineering (BPE) Program Description (PD 19-7680) and encompasses multiple pathways for engaging the engineering community:
 - Track 1: Planning and Conference Grants,
 - Track 2: Research in Broadening Participation in Engineering,
 - Track 3: Inclusive Mentoring Hubs (IM Hubs), and
 - Track 4: Centers for Equity in Engineering (CEE).
- Proposals in Tracks 1 and 2 can be accepted at any time. However, it is encouraged that projects seeking possible funding for the current Fiscal Year submit their proposals no later than June 30th. Proposals submitted after this date will be considered for funding in the subsequent Fiscal Year.
- Proposals submitted to other program announcements and solicitations for consideration in BPE, including the Faculty Early Career Development Program (CAREER), must meet their respective deadlines; please refer to the deadline dates specified in the appropriate announcement or solicitation. Proposals for Early-concept Grants for Exploratory Research (EAGER) or Rapid Response Research (RAPID) can be submitted at any time but Principal Investigators must contact the cognizant BPE Program Director prior to submission. Supplemental funding requests and proposals for planning or conference grants can be submitted at any time, and Principal Investigators are encouraged to contact the cognizant Program Director prior to submission.
- The BPE program does not provide support for undergraduate tuition.

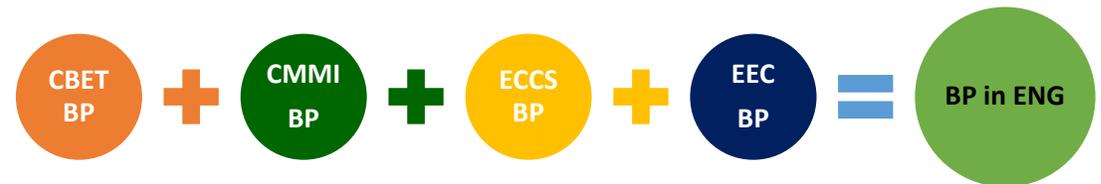
Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 22-1), which is effective for proposals submitted, or due, on or after October 4, 2021.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

- Introduction of new solicitation
- Overview of BP in Engineering
- Question and answer session



NSF Mission Statement

NSF Mission:

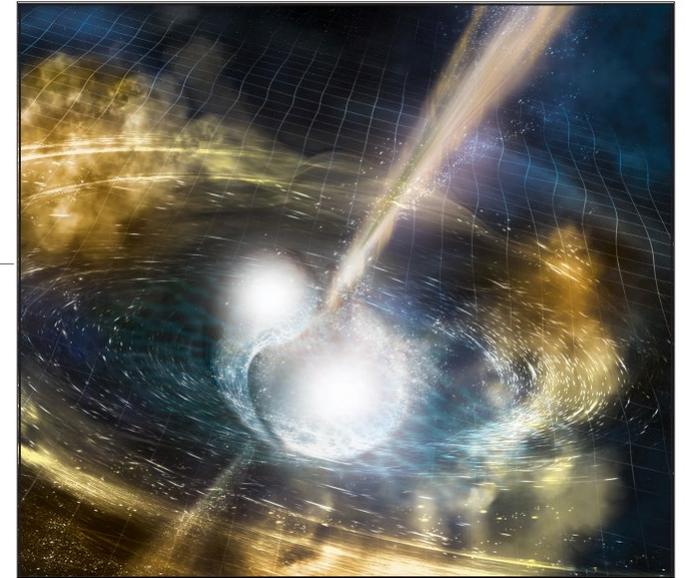
To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense....

NSF's goals:

discovery, learning, research infrastructure and stewardship -- provide an integrated strategy to advance the frontiers of knowledge, cultivate a world-class, **broadly inclusive science and engineering workforce** and expand the scientific literacy of all citizens, build the nation's research capability through investments in advanced instrumentation and facilities, and support excellence in science and engineering research and education through a capable and responsive organization.



NSF Strategic Plan



FY 2018 – 2022: 3 strategic goals

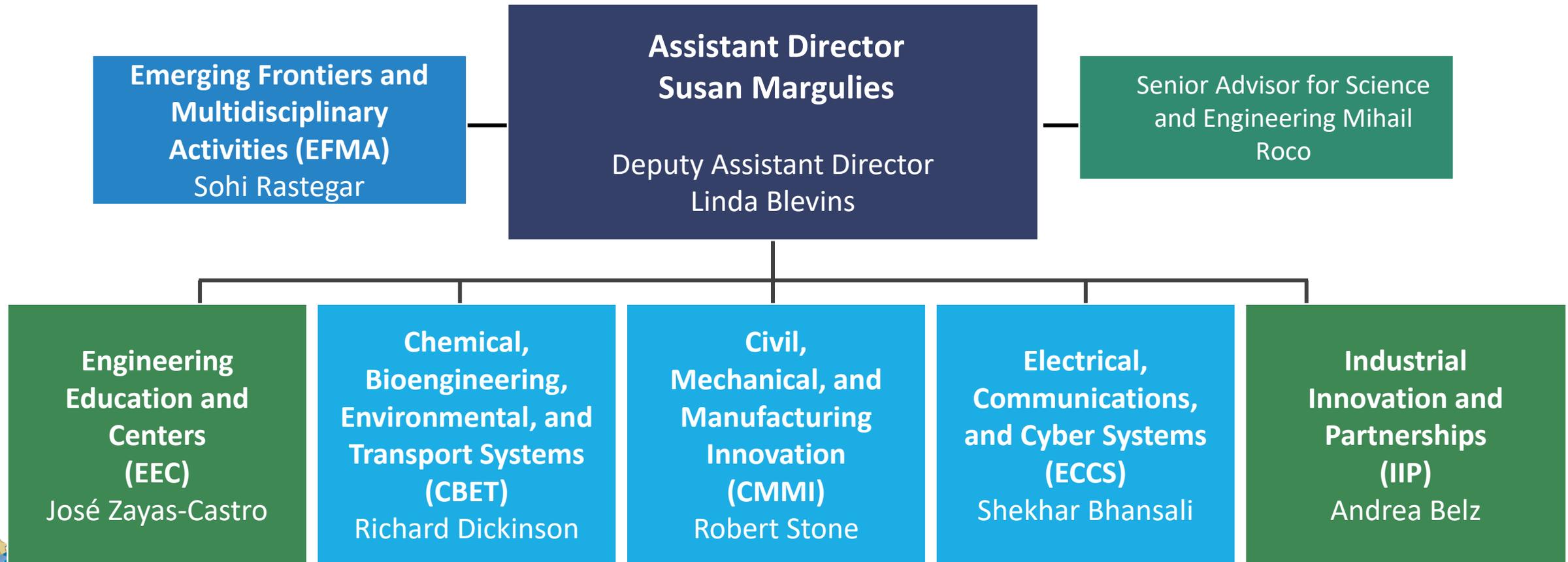
Expand knowledge in science, engineering, and learning

Advance the capability of the Nation to meet current and future challenges

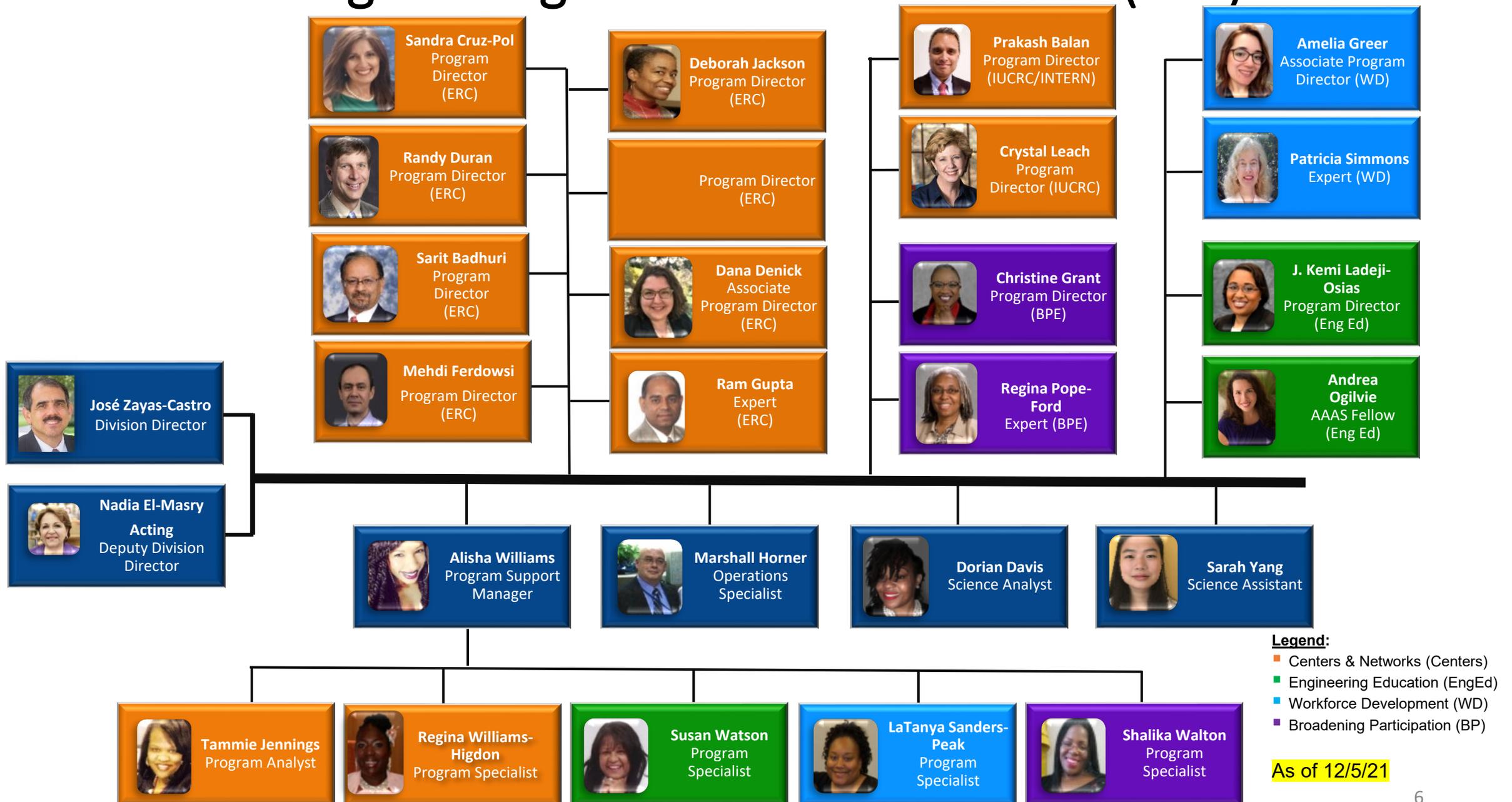
Enhance NSF's performance of its mission → includes strategies to **attract, retain, and empower a talented and diverse workforce**, and to continually improve agency operations.



NSF Directorate for Engineering



Engineering Education and Centers (EEC)



Broadening Participation in Engineering (NSF 22-514)

BPE funds research to:

- Understand the systemic barriers that prevent traditionally underserved communities from pursuing and succeeding in engineering.
- Analyze factors that enhance our ability to increase access to engineering by creating support systems and social networks that raise career awareness about different engineering pathways.
- Develop innovative methods and projects to significantly impact the recruitment and retention of engineering students, faculty and employees from traditionally underserved communities.
- Design and transform culture to make diversity, equity and inclusion a priority in the engineering enterprise.

See solicitation for details on deadlines and requirements....

Broadening Participation in Engineering (BPE)

PROGRAM SOLICITATION NSF 22-514

REPLACES DOCUMENT(S): PD 19-7680



National Science Foundation
Directorate for Engineering
Engineering Education and Centers

Letter of Intent Due Date(s) (optional) (due by 5 p.m. submitter's local time):

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September 21, 2022

Third Wednesday in September, Annually Thereafter

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IMPORTANT INFORMATION AND REVISION NOTES

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 - Track 1: Planning and Conference Grants,
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SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NEW!

Broadening Participation in Engineering (NSF 22-514)

Strengthens the future U.S. engineering workforce by enabling and encouraging the participation of all citizens in the engineering enterprise via 4 tracks:

1. Planning and Conference Grants
2. Research in Broadening Participation in Engineering
3. Inclusive Mentoring Hubs (IMHubs) **NEW**
4. Centers for Equity in Engineering (CEE) **NEW**

• ***See solicitation for details on deadlines and requirements***

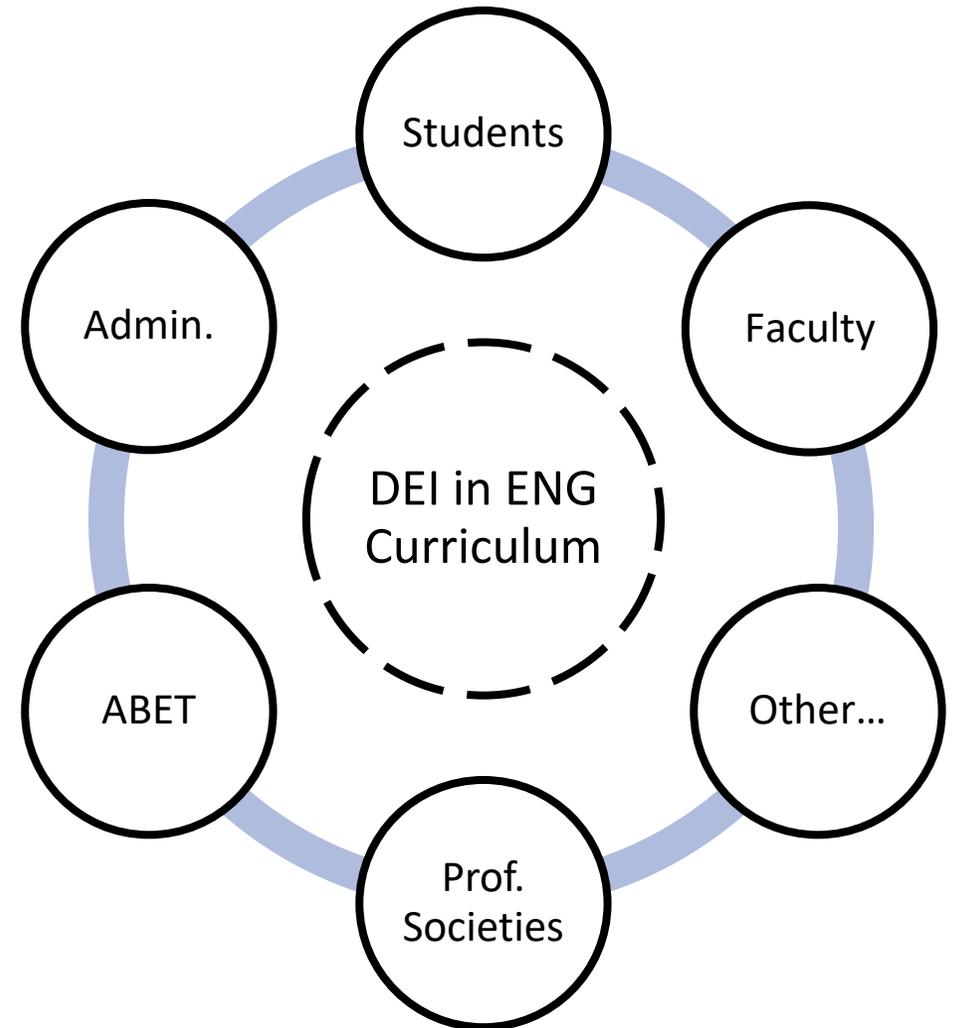


- Unsolicited Research
- CAREER
- Planning Grants
- Travel, Conferences & Workshops
- EARly-concept Grants for Exploratory Research (EAGER)
- Rapid Response Research (RAPID)

Premise: The incorporation of Diversity Equity and Inclusion (DEI) concepts in Engineering Curricula presents myriad opportunities (and challenges) for research and program development...

Core Elements:

- *Development* of programs based on “needs” of various stakeholders, constituencies and beneficiaries (e.g., students, faculty, etc.).
- *Utilization* of strategies based in DEI and educational scholarship.
- *Identification* of content format and compatibility with current curriculum (e.g., case studies, classroom elements).
- *Creation* of mechanisms to implement/incorporate proven approaches into the curriculum.
- *Authentic engagement* of content developers/deliverers (e.g., faculty, teaching assistants) in the process.
- *Long term adoption* of curriculum-based concepts
- *Assessment* of impact, effectiveness



EEC Division - BPE



The **Broadening Participation in Engineering (BPE) Program** seeks to strengthen the future U.S. engineering workforce by enabling and encouraging the participation of all citizens in the engineering enterprise.

The **BPE Program** seeks to support not only research in the science of broadening participation and equity in engineering, but also collaborative endeavors which foster the professional development of a diverse and well-prepared engineering workforce *as well as* innovative, if not revolutionary, approaches to building capacity through inclusivity and equity within the engineering academic experience.



Broadening Participation in Engineering (NSF 22-514)

Track 1
Planning and
Conference
Grants

Track 2
Research in
Broadening
Participation
in
Engineering

Track 3
Inclusive
Mentoring
Hubs
(IMHubs)

Track 4
Centers for
Equity in
Engineering
(CEE)



BPE Program Description: Track 1



**Track 1
Planning
and
Conference
Grants**

Supports efforts necessary to build capacity and establish collaborations endeavoring to address BP and equity challenges in engineering at scale.

Conference Grants

Focus on engaging communities and/or identifying synergies to inform the development of a future Planning Grant

Planning Grants

Designed to foster/facilitate engineering community on formation of convergent BPE research and/or collaborative BPE relevant projects.

BPE Planning Grant not a prerequisite for submitting proposals to BPE Tracks 2 - 4.



Track 1 - Details



**Track 1
Planning
and
Conference
Grants**

- Duration: 12 months
- Expected Budget: \$50,000-\$100,000
- Deadline to apply: None – Apply anytime
- LOI: Optional
- Submit via Research.gov
- Note: must follow the proposal preparation instructions for "Planning Proposals" or "Conference Proposals" contained in Chapter II.E the PAPPG.





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[Home](#) [Meetings](#) [2020 ECEDHA Annual Conference and ECExp](#) [IEC Workshop 2020](#)

2020 ECEDHA ANNUAL CONFERENCE AND ECExp



CONFERENCE March 18-21, 2020 | ECExp March 20-21, 2020 | Renaissance Orlando at SeaWorld® | Orlando, Florida

[Conference Home](#)

[Schedule](#)

[ECExp](#)

[Program Committee](#)

[Sponsors](#)

[Hotel & Travel](#)

[Sponsorship Opportunities](#)

[Register](#)

The Inclusive Engineering Consortium Workshop

BPE Program Description: Track 2

Track 2
Research in
Broadening
Participation
in Engineering

Supported research activities provide scientific evidence to make informed decisions regarding the implementation of effective programs that broaden participation and in the engineering discipline and workforce.

Funds research to:

- Understand the systemic barriers
- Analyze factors that enhance our ability to increase access to engineering
- Develop innovative methods and projects to significantly impact the recruitment and retention of engineering students, faculty and employees from underserved communities
- Design and transform culture to make DEI a priority



BPE Program Description: Track 2

Track 2
Research in
Broadening
Participation
in Engineering

Funds research for K-12 to the professional and academic workforce.

Research outcomes should be:

- *Scalable and sustainable*
- *Applicable to various contexts, settings and demographics*

Particular interest in research employing intersectional approaches

- Research activities must be supported by relevant data
- Leverage BP foundational work where appropriate
- Have the capability to produce a model that can be replicated across the ENG community.

Well defined research questions should also form the backbone and substance of the proposed work.



BPE Program Description: Track 2

Track 2
Research in
Broadening
Participation
in Engineering

BPE is interested in research activities that align with and provide meaningful connections to the NSF INCLUDES National Network. Collaborations are encouraged between BPE proposals and existing NSF INCLUDES projects



NSF INCLUDES



To enhance U.S. leadership in science and engineering by developing STEM talent from all sectors of our society

Funding: Launch Pilots, Planning grants, Alliances, Coordination Hub

Partnerships with 8 federal agencies



- **NSF INCLUDES Alliance: Partnerships Launching Underrepresented Students:** Northeastern University, Karl Reid, Claire Duggan, Richard Harris Michael Silevitch; Sage Fox Group Alan Peterfreund

**FIRST NSF INCLUDES
ENGINEERING ALLIANCE
PROJECT!**

Announcement

NSF INCLUDES announces new Alliances focused on increasing equity and broadening participation in STEM



SOURCE: <https://coe.northeastern.edu/news/northeastern-wins-10-million-nsf-grant-to-boost-people-of-color-and-women-in-engineering-nationally/>

Northeastern Wins \$10 Million NSF Grant to Boost People of Color and Women in Engineering Nationally

August 11, 2021



Despite decades of scattered efforts to improve diversity in engineering, the number of women and people of color remains far below their representation in the U.S. population as a whole.

To solve this problem, Northeastern's College of Engineering won a prestigious \$10 million grant from the National Science Foundation to build a system and a network to increase engineering degrees among women and BIPOC (Black, Indigenous, and Other People of Color) nationally.



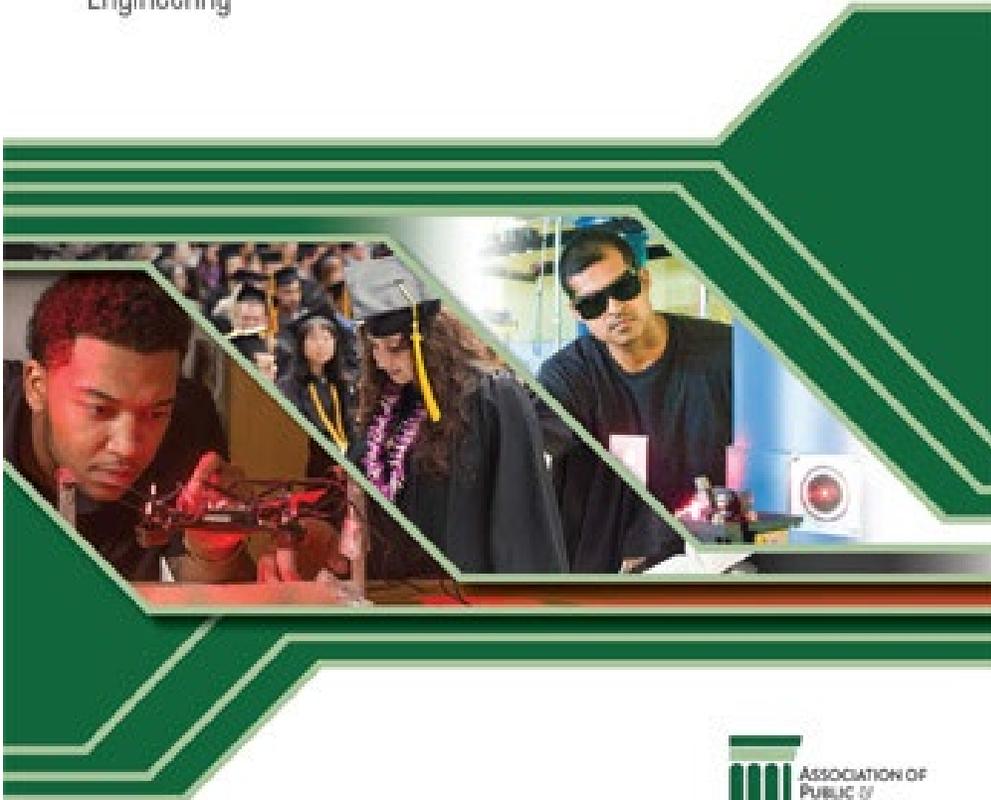
BPE - Project Examples

- **Investigating the Impact of Engineering Graduate Student Financial Literacy on URP Entering and Staying in the Engineering Workforce:** Luis A Vazquez, New Mexico State University
- **Collaborative Research: Rising Doctoral Institute:** Mayra Artiles Fonseca, Arizona State University
- **Broadening Participation in Engineering: A Qualitative Study on Latina/o Persistence In and Beyond the Degree:** Erika Mein, Alberto Esquinca, Elsa Villa; University of Texas at El Paso
- **Investigating the Barriers to Retention and Tenure for Black and Hispanic Engineering Faculty at R1 Institutions;** Henry Tran and Spencer Platt ; University of South Carolina at Columbia
- **NSF INCLUDES: Increasing Degrees Awarded to African American, Hispanic, Native American and Women Students in Engineering (50K Coalition)** Karl Reid (NSBE), Karen Horting (SWE), Sarah Echohawk (AISES), Raquel Tamez (SHPE) Barry Cordero (SHPE)
- **Collaborative Research: Should I Stay or Should I Go? Understanding the Retention of Latinx in Engineering Jobs;** Lisa Flores, University of Missouri-Columbia; Rachel Navarro, University of North Dakota Main Campus



The 2018 Status Report on Engineering Education:

A Snapshot of Diversity
in Degrees Conferred in
Engineering



Award Abstract #1734899

The APLU Project: Status Reports on Broadening Participation in Engineering

NSF Org: [EEC](#)
[Div Of Engineering Education and Centers](#)



2021 NSF CAREER:

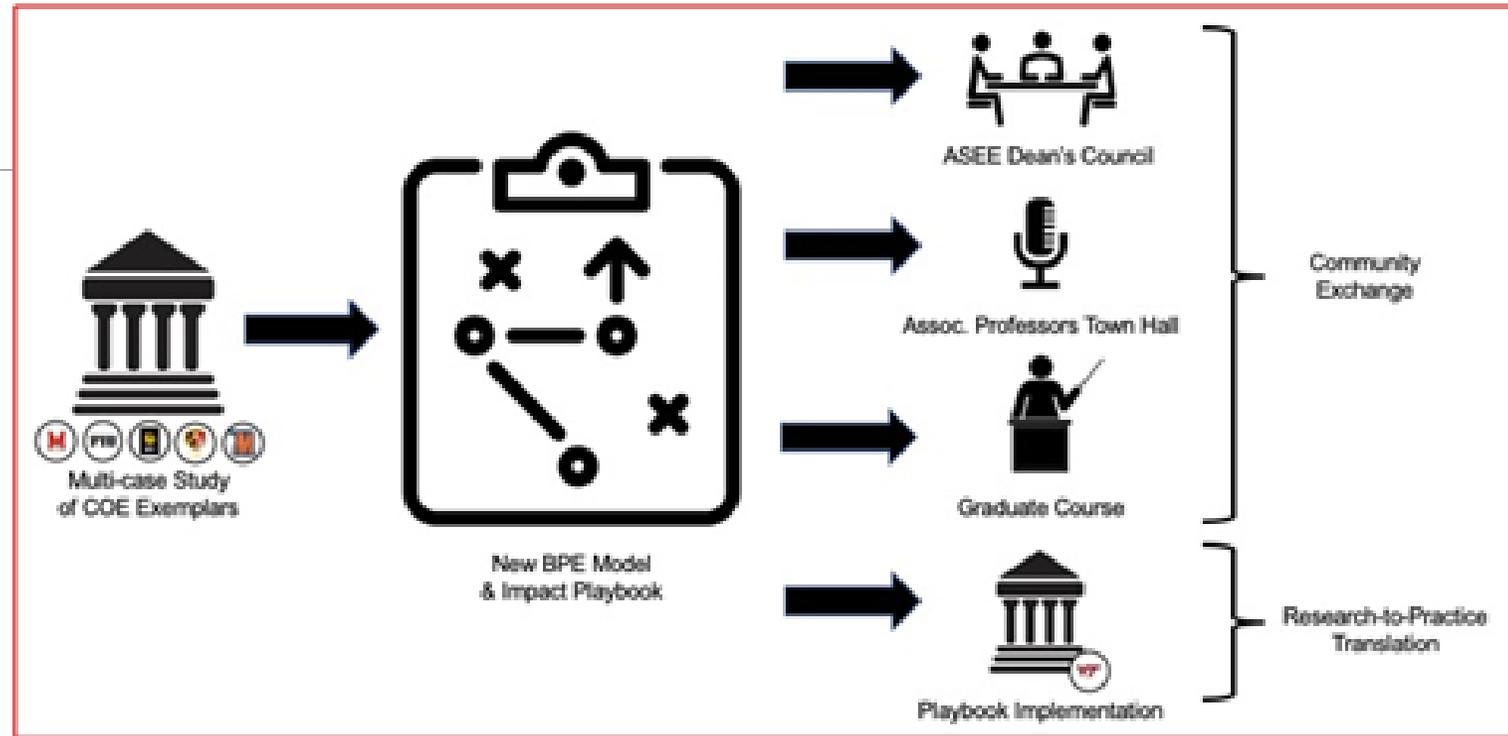
Disrupting the status quo regarding who gets to be an engineer



PI: Jeremi London, Ph.D.

*Assistant Professor of
Engineering Education*

Virginia Tech
(EEC 2042377)



- **Education Aim:** Set COEs on a **path to parity**, such that COEs' student demographics reflect the racial/ethnic makeup of the nation
- **Research Aim 1:** Advance our understanding of the **change strategies exemplary Colleges of Engineering (COE)** use to improve Black and brown students' access to engineering education and careers.
- **Research Aim 2:** Develop an empirically-valid **model for broadening participation** of URM students in COEs.



Track 2: Details

Track 2
Research in
Broadening
Participation
in Engineering

- Duration: Up to 36 months
- Expected Budget: Average award \$400,000; if greater than \$400,000 contact Program Director
- Deadline to apply: None – Apply anytime
- LOI: Optional
- Submit via Research .gov





BPE Program Description: Track 3

Track 3
Inclusive
Mentoring
Hubs
(IMHubs)

Encourage proposals *from all engineering disciplines* that investigate or leverage promising approaches to STEM related mentoring in an effort to establish all-access, open-platform racially and ethnically Inclusive Mentoring Hubs (IMHubs).

Can leverage or build upon existing mentoring resources; recommend activities be creative, innovative and distinct in their approach

Goal: Connect and dynamically build networks for racial and ethnic groups not sufficiently represented in STEM or, more specifically, the engineering profession.



BPE Program Description: Track 3

NEW

Track 3 Inclusive Mentoring Hubs (IMHubs)

Communities served by IMHubs may include 1 or more of the following:

- Students (K-12, undergraduate and graduate);
- University and College Faculty and Leaders;
- Postdoctoral and Career Transitioning Researchers;
- Small Businesses and Industry Professionals;
- K-12 Educators and Practitioners; and
- Researchers from National Labs.

An IMHub is expected to :

- Offer free access to mentoring and networking opportunities
- Provide professional development programs for members
- Coordinate institutional and organizational involvement in order to curate, develop and expand mentoring programs



BPE Program Description : Track 3



Track 3 Inclusive Mentoring Hubs (IMHubs)

Possible activities:

- Participation in curriculum-based modules focused on engineering as a career
- Grant writing (e.g., NSF proposal preparation)
- Entrepreneurship
- Transitioning between academia, industry or government
- Mentor/mentee training and skills development
- Structured individual professional development assignments for those who plan to enter, or who have recently entered, the engineering workforce or faculty.

Activities should be creative, innovative and distinct in their approach



BPE Program Description: Track 3



Track 3
Inclusive
Mentoring
Hubs
(IMHubs)

- Duration: At least 5 years
- Expected Budget: Not to exceed \$800K
- Deadline to apply:
 - Optional LOI
Dec. 3, 2021/ Nov. 21, 2022
3rd Wednesday in September, annually thereafter
 - Full Proposal
Jan. 28, 2022/Nov. 16, 2022
3rd Wednesday in November, annually thereafter
- Submit via Research .gov
- Note: Awards should be submitted by lead institution with at least two partnering institutions (as sub-awards)



BPE Program Description: Track 4



Track 4 Centers for Equity in Engineering (CEE)

Growing recognition of need to create and support a 21st Century inclusive and innovative engineering profession. Requires understanding of:

- How engineers from all communities are formed
- How they can be supported to successfully obtain both the technical and professional skills needed to solve complex, often critical, problems facing today's society.

Consider cultural, organizational, structural, and pedagogical changes needed to transform institution's College of Engineering where students are equally:

- Included and engaged
- Provided with opportunities to develop and hone technical and professional skills
- Enabled to establish their identities as professional engineers



BPE Program Description : Track 4



Track 4

Centers for
Equity in
Engineering
(CEE)

- Proposed activities at the engineering college level or higher,
- Including community, two year and associate
- Not a singular office or engineering department.
- Center evolution and sustainability ...proposers expected to submit a "**Phase I**" CEE proposal.

Phase I projects and funding are focused on

1. establishing infrastructure supporting CEE in College of Engineering and
2. deploying curricular/training activities across the submitting institution's College of Engineering aligned w/CEE co-dependent goals of inclusion and professional preparation in engineering.





BPE Program Description : Track 4

Track 4
Centers for
Equity in
Engineering
(CEE)

After Phase I activities established (i.e. CEE project in 2nd funding yr.),

- a site visit completed and
a discussion of the proposing institution's intent to submit a CEE proposal to the next phase held with cognizant NSF BPE Program Director, proposers may submit a CEE Phase II proposal.

*****A Phase I award is a pre-requisite for a Phase II BPE CEE proposal.*****

Phase II proposal builds upon the newly established center's **Phase I** activities and focuses on the center partnering with additional universities and colleges to expand, enrich and sustain the program.



BPE Program Description : Track 4



Track 4

Centers for
Equity in
Engineering
(CEE)

Phase I institutions encouraged to partner with at least two other institutions. Highly encouraged that at least one of these partners include an institution from

- an EPSCoR state
- *minority-serving institution (MSI), or*
- *community college (for example 3-2, dual or combined programs).*

Phase II proposals must be submitted by the Phase I awardee (PI and institution) with partnering institutions as sub awardees.



BPE Program Description : Track 4



Track 4

Centers for
Equity in
Engineering
(CEE)

Phase II Requires a:

- Plan for sustainability
- Detailed plan for resource sharing among the partnering institutions.

Phase I and Phase II CEE proposals should include a comprehensive:

- Management Plan
- Dissemination Plan
- BPE CEE **Phase II** Evaluation & Assessment Plan to be overseen by an independent evaluator (inclusion social scientists in evaluation encouraged).



Track 4: Details



Track 4
Centers for
Equity in
Engineering
(CEE)

Phase I

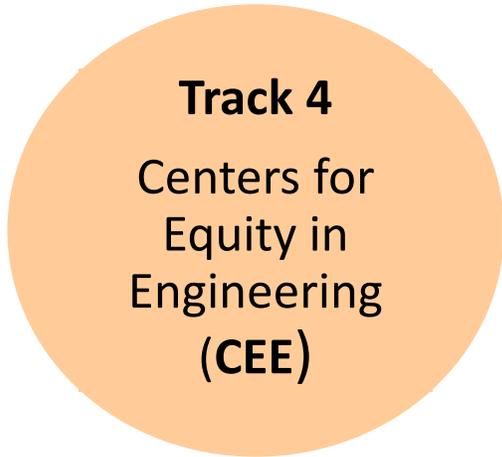
- Duration: At least 24 months
- Expected Budget: Not to exceed \$1.2M
- Requirement: Institutional Letter from the Dean (or equivalent) of the submitting institution's College of Engineering

Phase II

- Duration: At least 36 months
- Expected budget: not to exceed \$4.0 M.
- *Requirement:* Institutional Letter from the Dean (or equivalent) of the submitting Institution's College of Engineering as well as the Dean (or equivalent) of the partnering institution(s) College of Engineering



Track 4: Details



Deadline to apply:

LOI Strongly Recommended

Dec. 3, 2021

Nov. 21, 2022

3rd Wednesday in September, annually thereafter

Full Proposal

Jan. 28, 2022

Nov. 16, 2022

3rd Wednesday in November, Annually thereafter

Submit via Research .gov



Dear Colleague Letter (DCL):

EFRI Planning Grants to Promote Diverse Participation (NSF XYZ)

- **Encourage the formation of** potential EFRI research teams that actively draw on and fully integrate diverse engineering and science research talent, ideas, and perspectives in an intentionally inclusive manner and are responsive to the Emerging Frontiers in Research and Innovation (EFRI) solicitation (NSF 21-615).
- **Support team formation activities** that create opportunities for the development of partnerships between researchers and institutions that are bi-directional and mutually beneficial, thus engaging diverse perspectives and scientific talent to address the national needs and grand challenges presented in the EFRI solicitation
- EFRI Planning Grants are **designed for teams** preparing to apply to the FY23 EFRI competition

Due Date: January 28th, 2022

Up to \$100k for 12 months



Historically Black Colleges and Universities – Excellence in Research (HBCU-EiR) NSF 20-542

Primary goal: Increase support for researchers at HBCUs interested in pursuing research in domains that align with NSF's research program areas. Help to further the PI's research, improve research opportunities for students, and serve to improve research capacity at the institution.

Proposals submitted to EiR are routed for review to most appropriate research program(s) in one (or more) of the Directorates **as identified by the PI** as the secondary program(s).

Budget and Duration: Scope and scale commensurate with the projects typically supported by the research program(s) with which the proposal aligns, and appropriate to the proposed activities. No more than 20% of the budget can be allocated for equipment.

Participating Directorates:

- BIO
- GEO
- CISE
- MPS
- EHR
- OIA
- ENG
- SBE



Letter of Intent Due Date(s) (required): July 23, 2020
Fourth Thursday in July, Annually Thereafter

Full Proposal Deadline(s): October 06, 2020
First Tuesday in October, Annually Thereafter



Level Up Your Career

The next stage of Engineering
awaits



The E-Fellows program will provide postdoctoral researchers with a salary of \$75,000 per year, for two years. Upon selection, ASEE will issue subawards to host institutions, to cover salary, benefits and up to \$3,000 for travel expenses per fellow.

UPCOMING DEADLINES

- Application Opens: June 21, 2021
- Application Closes: July 6, 2021
- Award Announcements: August 1, 2021
- Start of Fellowship: September 7, 2021

•[eFellows \(asee.org\)](https://www.asee.org)

About the eFellows Program

The eFellows program places early-career PhDs in engineering fields in university research postdoctoral fellowships.

In addition to hands-on academic research with a faculty advisor, each fellowship cohort will participate in professional development and mentoring activities designed to prepare them for future research careers.

The eFellows program is administered by the **American Society for Engineering Education (ASEE)** with funding provided by the National Science Foundation (NSF).



For additional information

Contact: Christine Grant, BPE PO
email: cgrant@nsf.gov

Make an appointment

Provide a 1 pager prior to
appointment for discussion





**Any
Questions**

