National Science Foundation
Division of Undergraduate Education (DUE)

Grant Opportunities in the NSF Division of Undergraduate Education

Workshop for New Physics and Astronomy Faculty
June 28, 2018

Steve Turley
Corby Hovis

Program Officers
Division of Undergraduate Education (DUE)
Directorate for Education and Human Resources (EHR)

Outline

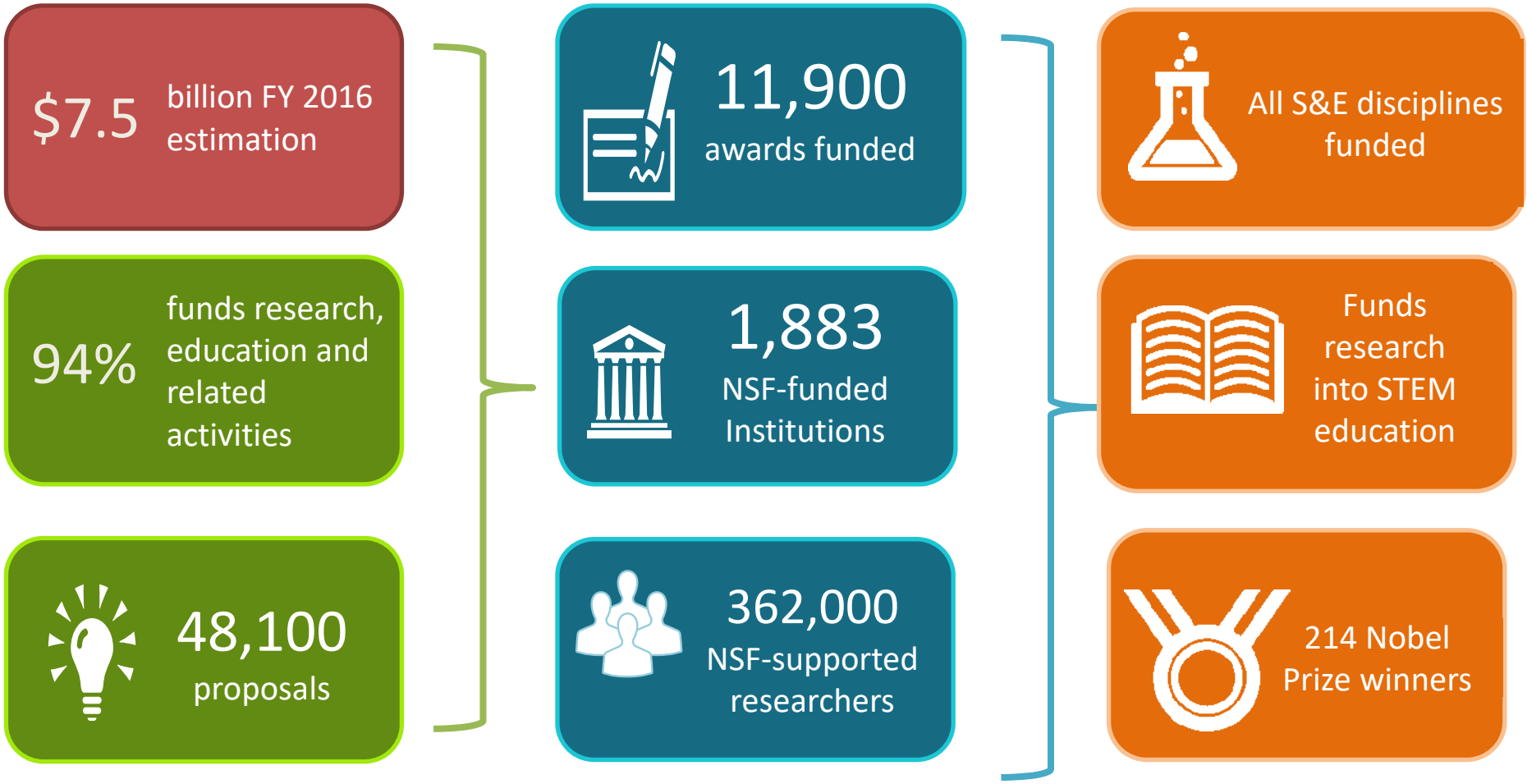
- About NSF
- Division of Undergraduate Education Programs
- Questions and Answers

NSF's Mission:

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

NSF Support:

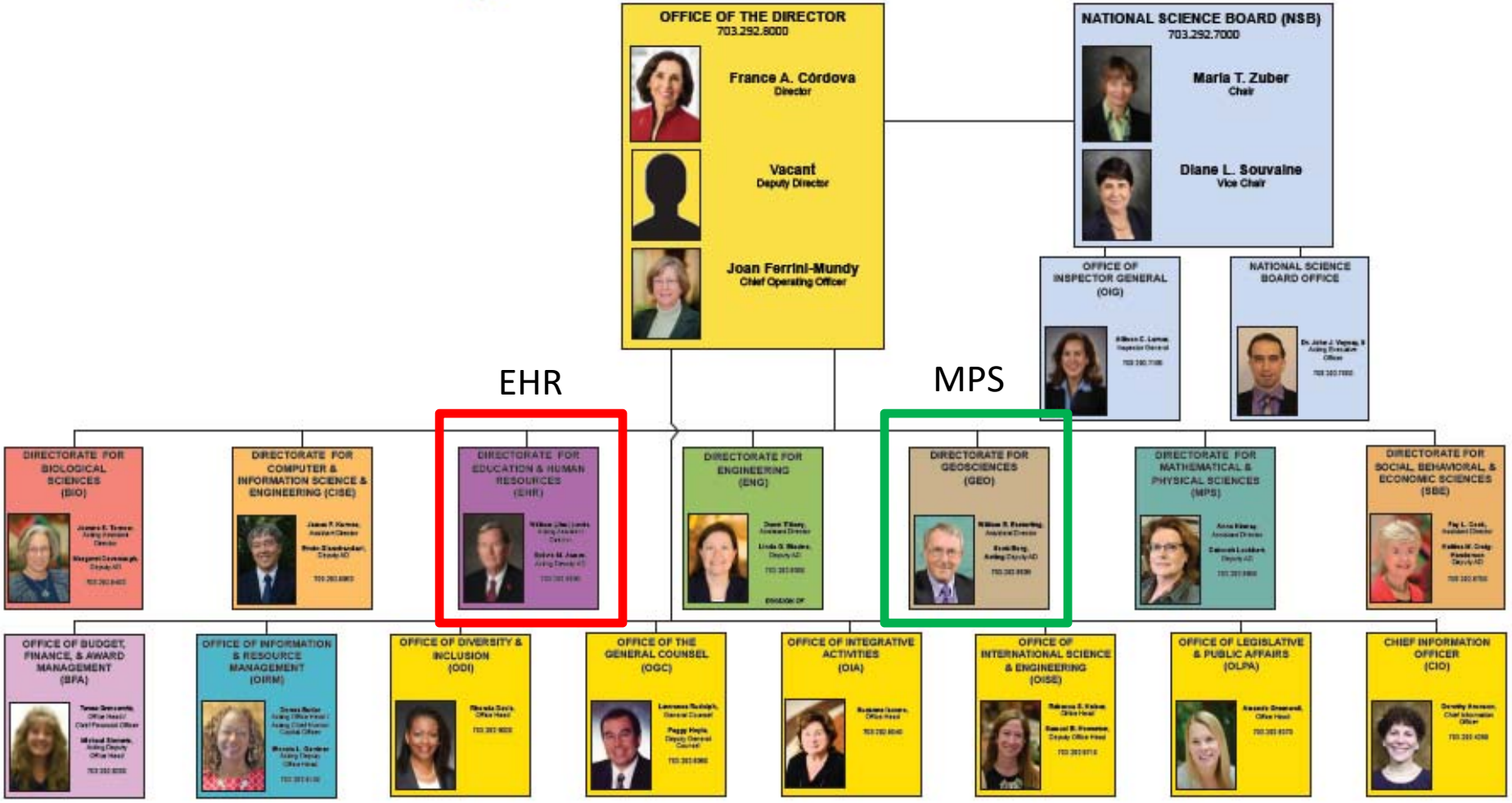
- *Is a primary driver of the U.S. economy.*
- *Enhances the nation's security.*
- *Advances knowledge to sustain global leadership.*



NSF by the numbers

Other than the FY 2016 figure, numbers shown are based on FY 2014 activities.

NATIONAL SCIENCE FOUNDATION



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April 2018

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Directorate for Education and Human Resources (EHR) Goals

- ✓ Prepare the next generation of STEM professionals and attract/retain more Americans to STEM careers
- ✓ Develop a robust research community that can conduct rigorous research and evaluation to support excellence in STEM education
- ✓ Increase the technological, scientific and quantitative literacy of all Americans
- ✓ Broaden participation and close achievement gaps in all STEM fields.

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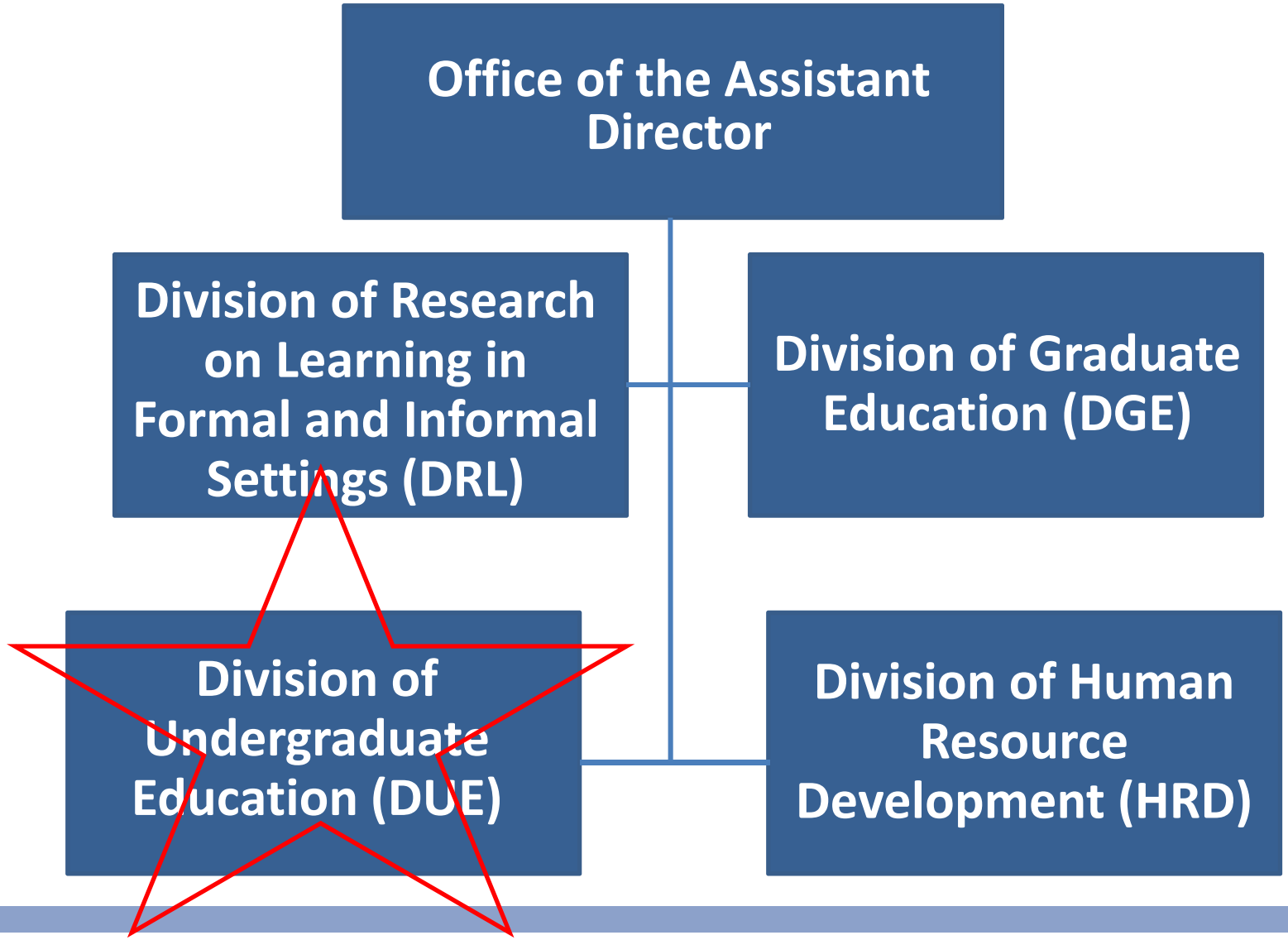
EHR's Organizational Structure



DUE's Mission:

To promote excellence in undergraduate science, technology, engineering, and mathematics (STEM) education for all students.

Potentially Tra  ormative Education R&D

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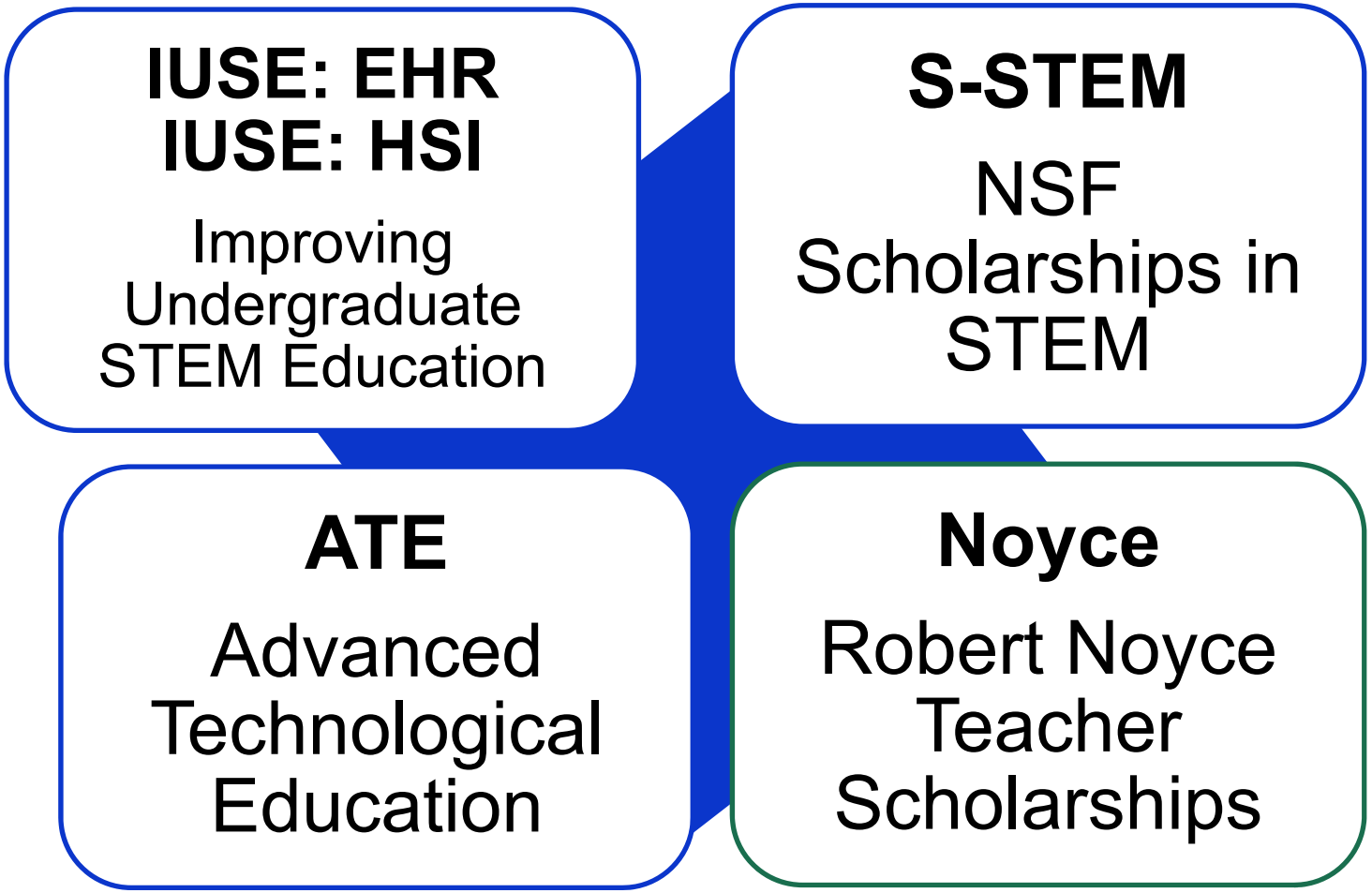

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- **ATE** (NSF 17-568)
  - Focuses on the education of technicians to meet workforce demands in existing and emerging advanced technological fields.
- **IUSE** (next slide)
- **Noyce** (NSF 17-541)
  - Encourages talented STEM majors and STEM professionals to become K-12 STEM teachers.
- **S-STEM** (NSF 17-527)
  - Supports institutional scholarship programs for full-time, academically-talented STEM students with demonstrated financial need.

IUSE: Improving Undergraduate STEM Education

- **IUSE: EHR** (NSF 17-590)
  - Works to improve the effectiveness of undergraduate STEM education, educate students to become leaders and innovators in STEM, and to provide a foundation in scientific literacy for all students.
- **IUSE: HSI** (NSF 18-524)
  - Similar to IUSE: EHR, but targeted to Hispanic-Serving Institutions.

Cross-Directorate STEM Education Programs

- Research Experiences for Undergraduates (REU: EHR; NSF 13-542)
- Faculty Early Career Development Program (CAREER: EHR; NSF 17-537)
- EHR Core Research (ECR; NSF 15-509)
- Research Coordination Networks for Undergraduate Biology Education (RCN:UBE; NSF 18-510)
- IUSE: HSI – Hispanic-Serving Institutions Program (NSF 18-524)

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ATE

Advanced Technological Education

SOLICITATION: NSF 17-568

ATE Program Overview

1) ATE Focuses on the education of technicians to meet workforce demands in existing and emerging advanced technological fields.
2) Colleges that award two-year degrees and their faculty must play leadership role on all projects.
3) Requires partnerships between two-year colleges and business and industry, along with secondary schools, four-year colleges and universities, and government, as appropriate.
4) Must respond to the hiring needs of for highly-skills technical workforce in the service area of the proposing institution(s).
5) Must address sustainability.
6) Read the program solicitation for more detailed information.

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S-STEM

NSF Scholarships in STEM

SOLICITATION: NSF 17-527

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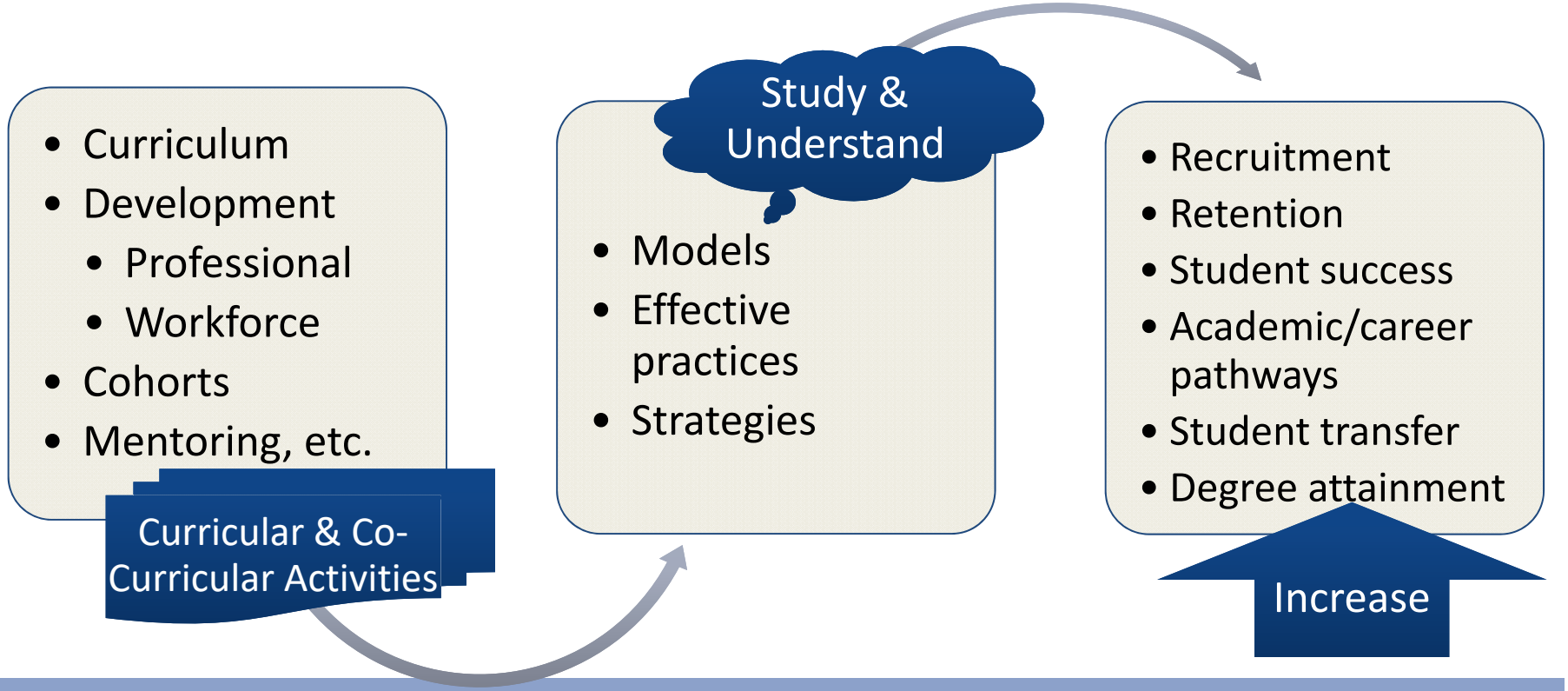
NSF Scholarships in STEM (S-STEM) Program

Supports institutional scholarship programs for full-time, academically-talented STEM students with demonstrated financial need.

- Scholarship Amount: Up to $10,000 per student per year (depending on **financial need**)
- 60% of Budget to Scholarships – 40% to Student Support, Admin., Research, Evaluation



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S-STEM Program

Three Program Tracks

Track 1: Institutional Capacity Building → **Up to $650K, Up to 5 yrs**

For institutions without prior funding from S-STEM or STEP programs

Track 2: Design and Development: Single Institution → **Up to $1M, Up to 5 yrs**

Tracks 2 & 3 seek to leverage S-STEM funds with institutional efforts and infrastructure to increase and understand impacts

Track 3: Design and Development: Multi-Institution Consortia → **Up to $5M, Up to 5 yrs**

Deadline (All Strands and Types):
28 March 2018
Last Wednesday in March, Annually Thereafter

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Management Team

Project teams composed of:

1) Faculty member currently teaching in one of the S-STEM disciplines
   - STEM disciplinary expertise

2) STEM Administrator
   - Communicate across functional units of institution

3) A researcher with experience in institutional, educational, discipline-based educational, or social science investigation at the institution or from another institution or research organization
   - Education, DBER, social science, change expertise

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IUSE: EHR

Improving Undergraduate STEM Education

SOLICITATION: NSF 17-590

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Improving Undergraduate STEM Education (IUSE: EHR)

Competitive proposals should build on available evidence and theory, generate evidence, and build knowledge.

Program Goals

Improve STEM Learning & Learning Environments:	**Build the Professional STEM Workforce for Tomorrow:**	**Broaden Participation & Institutional Capacity for STEM Learning:**
• Innovative curricula • Improved retention • Better teaching/learning environments • Improved adoption of best practices • Better mathematical and computation skills • Improved undergraduate mentoring • Technology enhancements	Improve the preparation of undergraduate students so they can succeed as productive members of the future STEM workforce, regardless of career path, and be engaged as members of a STEM-literate society	Increase the number and diversity of undergraduate students recruited and retained in STEM education and career pathways through improving the evidence base for successful strategies to broaden participation and implementation of the results of this research

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IUSE: EHR Program

Two Program Tracks

Engaged Student Learning

Focus on designing, developing, and implementing research on STEM learning models, approaches, and tools

Two Approaches

Exploration & Design (smaller scale)

Up to $300K
Up to 3 yrs

Development & Implementation (larger scale)

Level I:
Up to $600K, Up to 3 yrs

Level II:
$600K to $2M, Up to 5 yrs

Institutional and Community Transformation

Focus on increasing the propagation of highly effective methods of STEM teaching and learning

Two Approaches

Exploration & Design (smaller scale)

Up to $300K
Up to 3 yrs

Development & Implementation (larger scale)

Up to $3M
Up to 5 yrs

Deadlines:
Exploration and Design: No Deadlines
Development and Implementation: December 11, 2018

Common Guidelines

- The publication Common Guidelines for Education Research and Development offers guidance on building the evidence base in STEM learning. Research and development efforts that increase understanding of effective undergraduate STEM teaching and learning provide the foundation for building the STEM workforce of tomorrow and improving scientific literacy.

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Noyce

Robert Noyce Teacher Scholarship Program

SOLICITATION: NSF 17-541

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Noyce Teacher Scholarships

Act of Congress (2002)

GOAL: to encourage talented STEM majors and STEM professionals to become K-12 STEM teachers

Scholarship, stipend, and fellowship recipients must teach in a high-need school district for a specified number of years

Track 1 (S&S) Scholarships & Stipends	Undergraduate STEM majors and/or STEM career changers
Track 2 (TF) NSF Teaching Fellowships	STEM career changers
Track 3 (MTF) NSF Master Teaching Fellowships	Exemplary, experienced STEM teachers

Track 4 (Noyce Research) Research on the Preparation, Recruitment, and Retention of K-12 STEM Teachers

Deadline (All Tracks):
Last Tuesday in August, Annually Thereafter

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REU

Research Experiences for Undergraduates

SOLICITATION: NSF 13-542

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Deadline:
Fourth Wednesday in August, Annually Thereafter.

REU Foci & Funding

The Research Experiences for Undergraduates program supports active research participation by undergraduate students and involve students in meaningful ways in ongoing research programs or in research projects specifically designed for REU.

There are two mechanisms for support of student research:

(1) **REU Sites** are based on independent proposals to initiate and conduct projects that engage a number of students in research.

(2) **REU Supplements** may be included as a component of proposals for new or renewal NSF grants or cooperative agreements or may be requested for ongoing NSF-funded research projects.

BUDGET

- For summer REU projects, the total budget request--including all direct costs and indirect costs--is generally expected not to exceed **$1,200 per student per week**.
- The budget request for an academic-year REU project should be comparable on a pro rata basis.
- Projects that involve exceptional circumstances may exceed this limit.

Solid REU Site Proposals

- Undergraduates in focused research projects
- Target under-represented groups
- Predominantly research, not instruction
- Focus on students from other institutions
- Target primarily students who wouldn't otherwise have this experience
- Make your experience unique

Other Points to Consider

- Contact the Program Officer for your targeted discipline
  - Variations in expectations
  - Agreements within the community
- Talk to others with successful programs
  - Example: can't use NSF funds to pay for social activities, but you'll need to find a way to do them anyway

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CAREER

Faculty Early Career Development Program

SOLICITATION: NSF 17-537

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CAREER Foci & Funding

The Faculty Early Career Development Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.

The **minimum** CAREER award size is $400,000 for a five-year period for EHR.

A list of CAREER Division/Directorate Contacts can be found on the CAREER web page at http://www.nsf.gov/crssprgm/career/contacts.jsp.

Deadline (EHR):
Third Wednesday in July, Annually Thereafter

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ECR

EHR Core Research

SOLICITATION: NSF 15-509

ECR Foci

The EHR Core Research program of fundamental research in STEM education provides funding in critical research areas that are essential, broad and enduring. EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following focal areas:

- STEM learning, STEM learning environments,
- STEM workforce development, and
- broadening participation in STEM.

The ECR program is distinguished by its emphasis on the accumulation of robust evidence to inform efforts to

- understand,
- build theory to explain, and
- suggest interventions (and innovations) to address persistent challenges in STEM interest, education, learning, and participation.

The ECR program will fund fundamental research on: human learning in STEM; learning in STEM learning environments, STEM workforce development, and research on broadening participation in STEM.

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ECR Funding Levels

Funding should align with the maturity of the proposed work, the size and scope of the empirical effort, as well as the capacity of the interdisciplinary team to conduct the proposed research:.

Level I proposals:

- Maximum award size: $500,000
- Maximum duration: 3 years

Level II proposals:

- Maximum award size: $1,500,000
- Maximum duration: 3 years

Level III proposals:

- Maximum award size: $2,500,000
- Maximum duration: 5 years

Deadline (All Levels):
Second Thursday in September, Annually.

IUSE: Hispanic-Serving Institutions Program (HSI Program, 18-524)

- Addresses requirements set by Congress in the Consolidated Appropriations Act, 2017 and the American Innovation and Competitiveness Act, recognizing the need to build capacity at HSIs and increase graduation rates for students pursuing associates' and bachelors' degrees in STEM at HSIs.

- Focuses on undergraduate STEM education at HSIs
  - https://nsf.gov/ehr/HSIProgramPlan.jsp

Eligible Institutions

- Institutions must be accredited and offer undergraduate educational programs in STEM, and satisfy the HSI definition as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a), i.e.,
  - a) be an eligible institution; and
  - b) have a full-time equivalent enrollment of undergraduates that is at least 25% Hispanic.

- Certification of eligibility is required with submission of a proposal to the HSI Program.

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HSI Program

18-524

Track 1: Building Capacity

- $500K to $1.5M up to 5 years
  - Critical Transitions
  - Innovative Cross-Sector Partnerships
  - Research on Broadening Participation in STEM

Track 2: New to NSF

- Up to $250K for up to 3 years

Resource Hub

- Up to $3M for up to five years

Deadline (All Tracks):
March 6, 2018

Ten Big Ideas

Research

- NSF INCLUDES
- Harnessing data revolution
- Future of work at the human/technology frontier
- Rules of life
- Next quantum revolution
- Navigating the New Arctic
- Multi-messenger astrophysics

Process

- Convergence research
- Midscale research infrastructure
- NSF 2026

Helpful Links

- Big Ideas: https://www.nsf.gov/news/special_reports/big_ideas/
- Reviewer Survey (volunteer as reviewer): https://www.surveymonkey.com/s/NSF_DUE_Reviewer_Info

Questions?