

SELECTED CROSSCUTTING PROGRAMS

NSF crosscutting programs include interdisciplinary programs and programs that are supported by multiple directorates. For full funding data about Selected Crosscutting programs discussed here, see the Summary Tables chapter. Examples of major crosscutting activities include the following:

ADVANCE

In FY 2015, ADVANCE will fund transformative efforts to address the systemic barriers to women's full participation in academic science, technology, engineering, and mathematics (STEM) with funding of \$14.90 million, a decrease of \$1.56 million below the FY 2014 Estimate level of \$16.46 million. Although there is a program reduction, a major focus in FY 2015 will be broadening the spectrum of institutions participating in the program, to include more undergraduate and minority serving institutions and community colleges. This focus aims to increase the participation and advancement of women across higher education in academic science and engineering careers. Funding support for ADVANCE in FY 2015 is provided by the Directorates for Biological Sciences (BIO); Computer and Information Science and Engineering (CISE); Education and Human Resources (EHR); Engineering (ENG); Geosciences (GEO); Mathematical and Physical Sciences (MPS); and Social, Behavioral, and Economic Sciences (SBE).

Enhancing Access to the Radio Spectrum (EARS)

NSF's FY 2015 Budget Request provides \$23.0 million for EARS, a decrease of \$1.50 million from the FY 2014 Estimate of \$24.50 million. EARS' purpose is to fund interdisciplinary research that can enhance the efficiency with which radio spectrum is used, and/or lead to improved access to wireless services for all Americans. The EARS program is responsive to the 2010 NSF-supported workshop report, *Enhanced Access to the Radio Spectrum: A Path Forward*,¹ and to the 2010 National Research Council Report, *Spectrum Management for Science in the 21st Century*.² Both of these reports highlighted the need for research on new and innovative ways to utilize the spectrum more efficiently. EARS is a collaboration among CISE, ENG, and MPS.

Ethics Education in Science and Engineering (EERE)

NSF's FY 2015 Budget Request provides \$2.44 million for EERE, unchanged from the FY 2014 Estimate level. The EERE program aims to deepen the understanding of ethical dilemmas in science and engineering, and provide cutting edge, effective research and educational materials to train the next generation of scientists and engineers. It funds research and educational projects that improve ethics education in all fields of science and engineering supported by NSF. Although the primary focus is on improving ethics education for graduate students in NSF-funded fields, advanced undergraduates benefit as well. Funding for EERE is provided by BIO, CISE, ENG, GEO, SBE, and International and Integrative Activities (IIA).

Faculty Early Career Development (CAREER)

The FY 2015 Budget Request provides \$212.85 million for the CAREER program, an increase of \$2.43 million over the FY 2014 Estimate level of \$210.42 million. This will support approximately 400 new CAREER awards, which support exceptionally promising college and university junior faculty who are committed to the integration of research and education and who are most likely to become the leaders in their fields. All directorates participate in the CAREER program.

¹ www.nsf.gov/mps/ast/nsf_ears_workshop_2010_final_report.pdf

² www.nap.edu/openbook.php?record_id=12800

Graduate Fellowships and Traineeships

The FY 2015 Request provides \$391.64 million for NSF’s graduate fellowship and traineeship programs. This funding will enable NSF to support an estimated 7,000 graduate students, including 2,000 new graduate research fellows in FY 2015 as part of the expanded Graduate Research Fellowship (GRF) program, which will include new targeted opportunities to enable students to develop specialized expertise in critical areas.

- In FY 2015, GRF will continue as a flagship STEM graduate fellowship program for the federal government at a level of \$333.44 million, an increase of \$33.44 million over the FY 2014 Estimate level of \$300.0 million. Funding for the program is divided equally between the Education and Human Resources (EHR) account and the Research and Related Activities (R&RA) account. NSF will support approximately 2,000 new fellowships in FY 2015 and a stipend increase from \$32,000 to \$34,000. GRF will provide fellows up to three years of support over a five-year period.

Graduate Research Fellowship Program

	Total Number of Fellows	Number of New Fellows	Projected Fellows on Tenure ¹
FY 2014 Estimate	8,800	2,000	6,200
FY 2015 Estimate	10,000	2,000	7,000

¹ Fellowship tenure status is the period of time during which fellows actively utilize the fellowship award to pursue an advanced degree in a science, technology, engineering, or mathematics field.

- In FY 2015, NSF will expand innovation in graduate education through the NSF Research Traineeship (NRT) program, the successor to the Integrative Graduate Education and Research Traineeship (IGERT) program. Funding at a level of \$58.20 million is requested for NRT and will support an estimated 1,000 graduate students in FY 2015. NRT-specific activities are supported at \$37.84 million for the design and implementation of NRT programs in areas where new science is emerging and to introduce new approaches to preparing graduate students for a range of career options. NRT funding also includes \$7.0 million for a separate track that will invite proposals for design, innovation, and research in graduate student training and professional development. The remaining \$20.36 million of the requested funding is for continuing IGERT awards made in prior years. All directorates will participate in NRT and IGERT in FY 2015.
- For more information about NSF’s support of graduate fellowships and traineeships, see the Major Investments in Science, Technology, Engineering, and Mathematics (STEM) Graduate Education narrative in the NSF-Wide Investments chapter.

Improving Undergraduate STEM Education (IUSE)

The FY 2015 Request includes \$118.48 million (\$29.50 million above the FY 2014 Estimate of \$88.98 million) for IUSE. The IUSE program is an undergraduate education program that incorporates funding from established programs in the EHR directorate and in the BIO, ENG, and GEO directorates funded through the R&RA account. The FY 2015 funding will allow for awards in foundational research, design-based implementation, and scale-up effectiveness studies. For more information, see the Improving Undergraduate Science, Technology, Engineering and Mathematics Education (IUSE) narrative in the NSF-Wide Investments chapter.

Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)

The FY 2015 Request includes \$28.05 million for INSPIRE, or \$950,000 above the FY 2014 Estimate of \$27.10 million. The INSPIRE initiative was established in FY 2012 to encourage and support bold,

potentially transformative (PTR) interdisciplinary research (IDR) that transcends typical programmatic scope. It responds to issues raised in a variety of external and internal publications, including National Academies³ and National Science Board⁴ reports and documents relating to the America COMPETES Reauthorization Act of 2010. These reports identified barriers to interdisciplinary research and discussed perceptions in the research community that NSF does not always provide adequate opportunities for unsolicited PTR/IDR proposals that cross traditional boundaries. INSPIRE provides NSF with a funding mechanism that addresses the FY 2012 PCAST⁵ recommendations to adopt a diverse set of mechanisms to optimize a portfolio of awards that includes projects with potential game-changing impact and fall outside of traditional disciplines. In FY 2015, INSPIRE will support approximately 30 new up-to-\$1.0-million awards. All directorates participate in INSPIRE, with additional funding provided through the IIA budget line.

Long-Term Ecological Research (LTER)

The FY 2015 Request provides \$27.59 million, an increase of \$260,000 above the FY 2014 Estimate of \$27.33 million. LTER supports fundamental ecological research that requires data collection over long time periods and often at large spatial scales. This program supports a loosely coordinated network of more than two dozen field sites that focus on: 1) understanding ecological phenomena that occur over long temporal and broad spatial scales; 2) creating a legacy of well-designed, long-term ecological experiments; 3) conducting major syntheses and theoretical efforts; and 4) providing information to identify and to address environmental problems. LTER projects represent a diversity of habitats in continental North America, the Caribbean, Pacific Ocean, and the Antarctic, including coral reefs, arid grasslands, estuaries, lakes, prairies, various forests, alpine and Arctic tundra, urban areas, and agroecosystems. The increased support for LTER in FY 2015 covers planned periodic increases to cover higher costs. Funding for LTER is provided by BIO, GEO, and SBE.

NEON infrastructure will be co-located at eleven LTER sites. NEON is a continental-scale infrastructure facility providing standardized physical and data resources to researchers and educators. LTER is a network of long-term research projects aimed at understanding ecological processes in a wide range of ecosystems. Ongoing research at LTER sites may take advantage of data generated using NEON infrastructure. In addition, the co-location of NEON infrastructure at LTER sites will stimulate new research that builds on the long history of LTER research by enhancing the ability to extend site-based knowledge to regional and continental scales. For more information on NEON, see the NEON narrative in the Major Research Equipment and Facilities Construction chapter.

Research Experiences for Undergraduates (REU)

In FY 2015, \$75.13 million in funding is requested for the Research Experiences for Undergraduates (REU) Sites and Supplements program, a decrease of \$100,000 below the FY 2014 Estimate of \$75.23 million. NSF's ongoing support for REU reflects the importance of undergraduate research experiences in building students' interest and competence in STEM disciplines, and aligns with the Administration's focus on improving undergraduate STEM education. REU grants involve students at all stages of undergraduate education, including the freshman and sophomore levels, which enhances retention and graduation rates in STEM. REU Supplements allow students to join research projects that are supported by NSF research grants. REU Sites support cohorts of students to conduct research within STEM disciplines or on topics that cut across disciplines. Most of the students in an REU Site come from outside the host institution. This feature enables the program to involve students in research who might

³ Committee on Facilitating Interdisciplinary Research, Committee on Science, Engineering, and Public Policy (2004). *Facilitating interdisciplinary research*. National Academies. Washington: National Academy Press.

⁴Enhancing Support of Transformative Research at the National Science Foundation
www.nsf.gov/nsb/documents/2007/tr_report.pdf

⁵ President's Council of Advisors on Science and Technology, *Transformation and Opportunity: The Future of the U.S. Research Enterprise*, www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_future_research_enterprise_20121130.pdf (2012).

not otherwise have the opportunity, particularly students from institutions where research activities are limited. The REU program encourages partnerships between community colleges and baccalaureate degree-granting institutions to provide research opportunities for community college STEM students and faculty. Funding for REU is provided by BIO, CISE, ENG, GEO, MPS, and SBE.

Research in Undergraduate Institutions (RUI)

The FY 2015 Request for NSF's RUI program totals \$39.60 million, or \$350,000 below the FY 2014 Estimate level of \$39.95 million. The RUI activity supports research by faculty members of predominantly undergraduate institutions through the funding of (1) individual and collaborative research projects, (2) the purchase of shared-use research instrumentation, and (3) Research Opportunity Awards for work with NSF-supported investigators at other institutions. Funding for RUI is provided by BIO, CISE, GEO, MPS, and SBE.