

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 2014, 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 \$16.63 million, a decrease of \$1.32 million below the FY 2012 Enacted level of \$17.95 million. Although there is a program reduction, a major focus in 2014 will be broadening the spectrum of institutions participating in the program, to include more undergraduate and minority serving institutions and community colleges, thereby increasing the participation and advancement of women across higher education in academic science and engineering careers. ADVANCE also participates in NSF's Career Life Balance (CLB) initiative; a ten-year initiative that integrates family-friendly practices into NSF's programs.

Catalyzing Advances in Undergraduate STEM Education (CAUSE)

The FY 2014 Request includes \$123.08 million for a new undergraduate education program CAUSE that incorporates funding from established programs in the EHR directorate and other NSF directorates funded through the Research and Related Activities (R&RA) account. It is created by consolidating three Division of Undergraduate Education (DUE) programs: STEM Talent Expansion Program (STEP), Widening Implementation and Demonstration of Evidence-based Reforms (WIDER), and Transforming Undergraduate Education in STEM (TUES); several R&RA programs: BIO's Transforming Undergraduate Biology Education (TUBE); ENG's Research in Engineering Education and Nanotechnology Undergraduate Education (NUE), GEO's Geosciences Education and Opportunities for Enhancing Diversity in the Geosciences (OEDG); and the cross-NSF program, Climate Change Education (CCE). The FY 2014 funding will allow for awards in foundational research, design-based implementation, and scale-up effectiveness studies. For more information, see the CAUSE narrative in this chapter.

Cyberlearning Transforming Education (CTE)

The FY 2014 Budget Request includes \$30.08 million for CTE, a decrease of \$1.0 million below the FY 2012 Enacted level of \$31.08 million. Funding for CTE is provided by the Directorates for Computer and Information Science and Engineering (CISE), Social, Behavioral, and Economic Sciences (SBE), and Education and Human Resources (EHR). Through CTE, NSF seeks to integrate advances in technology with advances in what is known about how people learn. Of particular interest are technological advances that allow more personalized learning experiences, draw in and promote learning among those in populations not served well by current educational practices, allow access to learning resources anytime and anywhere, and provide new ways of assessing capabilities. It is expected that cyberlearning research will shed light on how technology can enable new forms of educational practice and that broad implementation of its findings will result in a more actively-engaged and productive citizenry and workforce.

Enhancing Access to the Radio Spectrum (EARS)

NSF's FY 2014 Budget Request provides \$50.0 million for EARS, an increase of \$35.0 million above the FY 2012 Enacted level of \$15.0 million (the first year of the EARS program was in FY 2012). 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 increased support for EARS in FY 2014 is a ramp-up that is consistent with the 2010 NSF supported workshop report,

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*Enhanced Access to the Radio Spectrum: A Path Forward*¹, which highlighted the need for research on new and innovative ways to utilize the spectrum more efficiently. EARS is a collaboration among the Directorates for Computer and Information Science and Engineering (CISE), Engineering (ENG), and Mathematical and Physical Sciences (MPS).

Ethics Education in Science and Engineering (EERE)

NSF's FY 2014 Budget Request provides \$2.44 million for EERE, a decrease of \$310,000 below the FY 2012 Enacted level of \$2.75 million. 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 IIA.

Faculty Early Career Development (CAREER)

The FY 2014 Budget Request provides \$223.73 million for the CAREER program, an increase of \$17.38 million over the FY 2012 Enacted level of \$206.35 million. This will support approximately 500 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. In December 2012, the CAREER Coordinating Committee convened a special Advisory Committee (AC) to examine CAREER and to provide strategic advice on the scope and direction of the program. A report from the committee is anticipated by the end of FY 2013. CAREER also participates in NSF's Career Life Balance (CLB) initiative; a ten-year initiative that integrates family-friendly practices into NSF's programs.

Graduate Fellowships and Traineeships

The FY 2014 Request provides \$380.21 million for NSF's graduate fellowship and traineeship programs. This funding will enable NSF to support an estimated 7,200 graduate students, including 2,700 new graduate research fellows in FY 2014 as part of the expanded National Graduate Research Fellowship (NGRF) program, which will include new targeted opportunities to enable students to develop specialized expertise in critical areas.

- In FY 2014, NGRF will represent a flagship STEM graduate fellowship program for the federal government at a level of \$325.14 million, an increase of \$127.0 million over the FY 2012 Enacted level of \$198.14 million. Funding for the program is divided equally between the Education and Human Resources account and the Research and Related Activities account. Through this expanded program, NSF will be able to award approximately 700 additional fellows bringing the total estimated number of new fellowships awarded in FY 2014 to 2,700. NGRF will provide fellows up to three years of support over a five-year period. For more information see the Major Investments in Science, Technology, Engineering, and Mathematics (STEM) Graduate Education narrative in this chapter. NGRF also participates in NSF's Career Life Balance (CLB) initiative; a ten-year initiative that integrates family-friendly practices into NSF's programs.

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

National Graduate Research Fellowship Program

	Total Number of Fellows	Number of New Fellows	Projected Fellows on Tenure ¹
FY 2013 Estimate	7,800	2,000	4,200
FY 2014 Estimate	8,900	2,700	6,200

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

- In FY 2014, NSF will challenge the community to expand innovation in graduate education through the NSF Research Traineeships (NRT) program, the successor to the Integrative Graduate Education and Research Traineeship (IGERT) program. Funding at a level of \$55.07 million is requested for NRT and will support an estimated 1,000 graduate students in FY 2014. \$33.71 million of the requested funding is for continuing IGERT awards made in prior years and the remaining \$21.36 million will support the design and implementation of traineeship programs in areas where new science is emerging and will introduce new approaches to preparing graduate students for a range of career options. For more information see the Major Investments in Science, Technology, Engineering, and Mathematics (STEM) Graduate Education narrative in this chapter.
- No funding is requested in FY 2014 for the NSF Graduate STEM Fellows in K-12 Education (GK-12) program as it was terminated.

Long-Term Ecological Research (LTER)

The FY 2014 Request provides \$27.59 million, an increase of \$190,000 above the FY 2012 Enacted level of \$27.40 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 2014 covers planned periodic increases to cover higher costs as sites are renewed. Funding for LTER is provided by BIO, GEO, and SBE.

In FY 2012, NEON infrastructure was 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.

Research Experiences for Teachers (RET)

The FY 2014 Request for NSF’s RET program totals \$6.95 million, a decrease of \$30,000 below the FY 2012 Enacted level of \$6.98 million. Funding will provide pre-service and in-service K-12 teachers, and community college faculty with discovery-based learning experiences. The professional development gained by the participants through this unique experience has enriched their performance in the classroom and their guidance of students in science and engineering. Funding for RET is provided by BIO, CISE, ENG, GEO, and MPS.

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Research Experiences for Undergraduates (REU)

In FY 2014, \$79.18 million in funding is requested for the Research Experiences for Undergraduates (REU) Sites and Supplements program, an increase of \$13.19 million over the FY 2012 Enacted level of \$65.99 million. \$10.00 million of this additional funding will support enhanced research experiences for students in their first two years of college, as recommended by the President's Council of Advisors on Science and Technology (PCAST) in their report, *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics*. The request for FY 2014 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 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 2014 Request for NSF's RUI program totals \$39.95 million, or \$200,000 below the FY 2012 Enacted level of \$40.15 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.