

SELECTED CROSSCUTTING PROGRAMS

Many investments at NSF draw on interdisciplinary teams from across the Foundation and are supported by multiple directorates. Other parts of this chapter, NSF-Wide Investments, provide narratives for NSF-wide priority investments such as Cyber-enabled Materials, Manufacturing, and Smart Systems (CEMMSS); Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS); and Understanding the Brain (UtB). Additional cross-cutting programs at NSF are presented in the narrative below, and full funding data for these programs is provided in the Summary Tables chapter.

ADVANCE

In FY 2018, \$4.90 million in funding is requested for the ADVANCE program, a decrease of \$9.96 million below the FY 2016 Actual. In FY 2018, ADVANCE will not make any new program commitments. Funding for ADVANCE in FY 2018 is provided by the Directorates for Biological Sciences (BIO); Education and Human Resources (EHR); Geosciences (GEO); Mathematical and Physical Sciences (MPS); and Social, Behavioral and Economic Sciences (SBE).

Faculty Early Career Development (CAREER)

The FY 2018 Request provides \$242.20 million for the CAREER program, a decrease of \$38.45 million from the FY 2016 Actual. This funding will support approximately 440 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. Funding for CAREER is provided by BIO, the Directorates for Computer and Information Science Engineering (CISE), Engineering (ENG), GEO, MPS, and SBE.

Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)

INSPIRE was established to address some of the most complex and pressing scientific problems that lie at the intersections of traditional disciplines and to advance the NSF's strategic goal to *Transform the Frontiers of Science and Engineering*. In FY 2016, NSF determined that dedicated funding is not necessary to encourage the kinds of projects supported through INSPIRE. In FY 2017, a new funding mechanism encompassing elements of INSPIRE was developed, Research Advanced by Interdisciplinary Research and Engineering (RAISE). In FY 2018, Office of Integrative Activities co-funding is eliminated and each directorate will support bold, potentially transformative interdisciplinary research through the RAISE mechanism, coordinating with other directorates as appropriate.

Long-Term Ecological Research (LTER)

The FY 2018 Request provides \$29.42 million for LTER; this is \$1.20 million below the FY 2016 Actual. 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 28 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 challenges. LTER projects represent a diversity of habitats in continental North America, the Caribbean, Pacific Ocean, Arctic, and the Antarctic; including coral reefs, arid grasslands, estuaries, lakes, prairies, forests, alpine and Arctic tundra, urban areas, and agroecosystems. The support for LTER in FY 2018 will be used to sustain site-specific research activities examining ecological and evolutionary change in populations and communities that have been studied for over 30 years, and conducting syntheses of long-term data using contemporary modeling methods. Funding for LTER is provided by BIO, GEO, and SBE.

The National Ecological Observatory Network (NEON) infrastructure will be co-located at eight 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

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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 2018, \$74.71 million in funding is requested for the REU Sites and Supplements program, a decrease of \$23.01 million below the FY 2016 Actual. NSF's ongoing support for REU reflects the importance of undergraduate research experiences in building students' interest and competence in STEM disciplines. REU grants involve students at all stages of undergraduate education. 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 faculty 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. NSF's REU Sites and Supplements programs fall within the Improving Undergraduate STEM Education framework as affiliated programs, with budget and award decisions remaining within individual directorates. Funding for REU is provided by BIO, CISE, ENG, GEO, MPS, and SBE.

Research in Disabilities Education (RDE)

The FY 2018 Request for NSF's RDE program totals \$5.50 million; this is \$3.79 million below the FY 2016 Actual. The RDE activity advances the goal of broadening the participation and achievement of postsecondary students with disabilities in STEM. RDE proposals are accepted in all fields of science and engineering supported by NSF, particularly research on learning and education. Planned funding for RDE is provided through EHR/DRL, with additional funding provided by EHR/HRD, CISE, and SBE for meritorious projects relevant their communities.

Research in Undergraduate Institutions (RUI)

The FY 2018 Request for NSF's RUI program totals \$35.34 million; this is \$8.20 million below the FY 2016 Actual. The RUI activity seeks to support high quality research by faculty members of predominantly undergraduate institutions, strengthen the research environment in academic departments that are primarily oriented toward undergraduate instruction, and promote the integration of research and education of undergraduate students. RUI proposals are accepted in all fields of science and engineering supported by NSF, including research on learning and education. Funding for RUI is provided by BIO, CISE, GEO, MPS, and SBE.