SELECTED CROSSCUTTING PROGRAMS

Many investments at NSF draw on interdisciplinary teams from across the Foundation and are supported by multiple directorates. Other parts of the NSF-Wide Investments chapter 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). Selected 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.

Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE)
In FY 2017, $14.10 million in funding is requested for the ADVANCE program, a decrease of $800,000 below the FY 2016 Estimate. ADVANCE funds transformative efforts to address the systemic barriers to women's full participation in academic science, technology, engineering, and mathematics (STEM) careers. In FY 2017, the ADVANCE program will focus on 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. Additionally, as the NSF INCLUDES National Network of Alliances takes shape in FY 2017, a second focus will be the alignment of ADVANCE with the NSF INCLUDES broadening participation challenges through the use of supplemental funding and other special grant options. It is anticipated that ADVANCE and other existing programs in the NSF broadening participation portfolio will form linkages and new partnerships to leverage the NSF INCLUDES Alliance investments. Funding for ADVANCE in FY 2017 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); and Social, Behavioral and Economic Sciences (SBE).

Faculty Early Career Development (CAREER)
The FY 2017 Request provides $229.58 million for the CAREER program, an increase of $3.07 million over the FY 2016 Estimate. This funding level 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. Funding for CAREER is provided by BIO, CISE, ENG, GEO, SBE, the Directorate for Mathematical and Physical Sciences (MPS), and the Office for International Science and Engineering (OISE).

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*. Dedicated funding is no longer necessary to encourage the kinds of projects supported through INSPIRE. Starting in FY 2017, each directorate will continue support for INSPIRE-like interdisciplinary research through core and cross-cutting programs, coordinating with other directorates and divisions, as necessary, for internal review of these projects. NSF anticipates developing a new funding mechanism that will manifest many of the principles of INSPIRE. This new funding mechanism will have guidelines published in the annual NSF Grants Proposal Guide, and will be available to any researcher conducting transformational, interdisciplinary research in fields that NSF supports.

Long-Term Ecological Research (LTER)
The FY 2017 Request provides $28.95 million for LTER, of which $27.95 million is discretionary funding and $1.0 million is new mandatory funding. This is an increase of $1.0 million above the FY 2016 Estimate. 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, forests, alpine and Arctic tundra, urban areas, and agroecosystems. The increased support for LTER in FY 2017 will be used to stimulate new research activities, including the establishment of new project sites, examining 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.

National Ecological Observatory Network (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 2017, $75.58 million in funding is requested for the REU Sites and Supplements program, an increase of $150,000 above the FY 2016 Estimate. 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. 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 Undergraduate Institutions (RUI)
The FY 2017 Request for NSF's RUI program totals $40.15 million; this is $1.0 million above the FY 2016 Estimate. The increase in funding will allow the RUI activity to increase its support of 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.