

## **NSF SELECTED CROSS-CUTTING PROGRAMS**

Many investments at NSF draw on interdisciplinary teams from across the Foundation. Other parts of this chapter, NSF-Wide Investments, provide narratives for NSF-wide priority investments. Additional cross-cutting programs at NSF are selected for presentation in the narrative below. Full funding data for these programs are provided in the Summary Tables chapter.

### **ADVANCE**

In FY 2022, \$20.50 million in funding is requested for the ADVANCE program to encourage institutions of higher education and the broader science, technology, engineering, and mathematics (STEM) community, including professional societies and other STEM-related not-for-profit organizations, to address various aspects of STEM academic culture and institutional structure to enhance gender equity for faculty and academic administrators. As such, ADVANCE is an integral part of the NSF's multifaceted strategy to broaden participation in the STEM workforce and supports the critical role of the Foundation in advancing the status of women in academic science and engineering. Further, ADVANCE contributes important research on successfully supporting women in STEM. EHR stewards funding for ADVANCE in FY 2022 to support projects in all areas of NSF STEM disciplines.

### **Faculty Early Career Development (CAREER)**

The CAREER program offers NSF's most prestigious awards in support of early-career faculty and is designed to provide stable support at a sufficient level and duration to enable awardees to develop careers not only as outstanding researchers but also as educators demonstrating commitment to teaching, learning, and dissemination of knowledge. The FY 2022 Request provides \$365.02 million for the CAREER program, funding approximately 680 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, MPS, and SBE.

### **Industry-University Cooperative Research Centers (IUCRC)**

The Industry–University Cooperative Research Centers (IUCRC) program accelerates the impact of basic research through close relationships between industry innovators, world-class academic teams, and government leaders. IUCRCs are designed to help corporate partners and government agencies connect directly and efficiently with university researchers to achieve three primary objectives. 1) Conduct high-impact research to meet shared industrial needs in companies of all sizes; 2) Enhance U.S. global leadership in driving innovative technology development and; 3) Identify, mentor, and develop a diverse high-tech, exceptionally skilled workforce. NSF created the IUCRC program in 1973 to foster long-term partnerships among industry, academe, and government. These partnerships support research programs of mutual interest, contribute to the nation's research infrastructure base, promote workforce development, and facilitate technology transfer. Every year, more than 2,000 students engage in industrially relevant research at Centers nationwide, giving them on the job training for a career in the private sector. About 30% of these student researchers are hired by the member companies.

The FY 2022 Request provides \$23.50 million for the IUCRC program. Primary funding for IUCRC is provided by CISE and ENG, with additional contributions from other directorates.

### **Long-Term Ecological Research (LTER)**

The FY 2022 Request provides \$33.54 million for LTER. LTER supports fundamental research that requires data collection over long time periods, to unravel the principles and processes of ecological science, which frequently involves long-lived species, legacy influences, and rare events. 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 2022 will be used to sustain site-specific research activities examining ecological and evolutionary dynamics in natural populations, communities, and ecosystems, some of which 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 is 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 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 some 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 Facilities chapter.

### **National Nanotechnology Coordinated Infrastructure (NNCI)**

In FY 2022, \$15.46 million is requested for the NNCI sites. This represents part of NSF's contribution to the National Nanotechnology Initiative (NNI), which is described in greater detail in the NNI section of NSF-Wide Investments. Funding for NNCI is provided by BIO, CISE, ENG, GEO, MPS, SBE, and OISE.

### **Research Experiences for Undergraduates (REU)**

In FY 2022, \$84.54 million is requested for the REU Sites and Supplements program. 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.

## *Selected Crosscutting Programs*

### **Research in Disabilities Education (RDE)**

The FY 2022 Request for NSF's RDE program totals \$6.50 million. The RDE activity helps increase participation in STEM for postsecondary students with disabilities. 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's Division on Research on Learning in Formal and Informal Settings, with additional funding provided by OIA, SBE, and EHR's Divisions of Human Resource Development and Undergraduate Education for meritorious projects relevant their communities.

### **Research in Undergraduate Institutions (RUI)**

The FY 2022 Request for NSF's RUI program totals \$32.99 million. 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, MPS, and SBE.