A MESSAGE FROM THE DIRECTOR

Photo: NSF/Stephen Voss

The National Science Foundation (NSF) is pleased to present its *Fiscal Year (FY) 2018 Agency Financial Report*. NSF is a U.S. federal agency with a global reputation for supporting groundbreaking research and education across the full range of science and engineering (S&E) disciplines. For over 68 years, NSF investments have enabled U.S. researchers to deepen our understanding of the universe, transform the way we live, open the world to new occupations and industries, and enrich our quality of life.

To define and position the U.S. at the leading edge of discovery, NSF is investing in 10 Big Ideas.[1] These bold, long-term research and enabling ideas focus on critical societal challenges and aim to catalyze breakthroughs from the S&E communities. They identify new frontiers of basic research such as the data revolution, quantum world, multi-messenger astronomy, and the human-technology interface. Foundational to achieving these goals are greater investments in S&E infrastructure and workforce, and the convergence of scientific disciplines to foster deep connections among scientific fields.

Cutting-edge science also requires that NSF strengthen its strategic collaborations with government, industry, academia, and international partners. In 2018, NSF and Boeing announced a partnership to accelerate training in critical skill areas and increase diversity in S&E fields. In May, NSF and the Air Force created a strategic research partnership to enhance national security. Our new international MULTIPLIER program deploys small teams of NSF experts to advance scientific frontiers by exploring strategic collaborations with global S&E researchers. In the important area of artificial intelligence (AI), NSF has an emerging collaboration with the Defense Advanced Research Projects Agency that also includes machine learning, and is supporting the Computing Community Consortium in the development of an interdisciplinary AI research and development roadmap anticipated in the spring of 2019. As co-chair of the National Science and Technology Council Select Committee on Artificial Intelligence, I work with my interagency colleagues on efforts to maintain the Nation's leadership in AI.

NSF supports discoveries across the broad spectrum of scientific disciplines. In 2018, an international research team, using data gathered by NSF's IceCube Neutrino Observatory at the South Pole, detected a high-energy neutrino, apparently from a cosmic source. The data, when combined with simultaneous observations of high-energy gamma rays by multiple observatories, and corroborated with archival IceCube neutrino data, point to an active galaxy called a blazar as the source. This remarkable result marks the discovery of the origin of high-energy cosmic rays, solving a century-old mystery. It is a discovery that, like the previous results with NSF's Laser Interferometer Gravitational-Wave Observatory, showcases the importance of multi-messenger astronomy. This past year, NSF supported a quantum research collaboration to create the first practical quantum computer capable of solving complex problems that today's best computers cannot solve. Other NSF-supported researchers study the behavior of Earth's atmosphere and the geo-space system, developing models to predict extreme events such as hurricanes, earthquakes, wildfires, and drought; still other researchers are collecting data on how people make decisions, and how community infrastructure systems respond during natural disasters. At the human-technology frontier, advances in the development of self-driving cars build on NSF research investments in precision sensors; computer vision, planning, and reasoning; real-time data analytics; and predictive modeling. As a major player in nanotechnology, NSF is helping to transform U.S. industry through advances in manufacturing, electronics, medical instrumentation, and materials science.

NSF catalyzes innovation that keeps the U.S. on the cutting edge of science and technology. It fosters this innovation through support of small businesses; promoting creative partnerships among academia, industry,

[1] NSF's 10 Big Ideas: https://www.nsf.gov/news/special_reports/big_ideas/

and national laboratories; broadening participation in the S&E enterprise by non-profit, non-academic organizations; and providing entrepreneurship training for academic scientists to accelerate commercialization of basic research. Moreover, NSF invests in world-class facilities and equipment – from telescopes and polar stations to ecological sites to cyberinfrastructure and supercomputers. At the end of September 2018, NSF announced its funding for the largest and most powerful supercomputer the agency has ever supported that will allow high performance computing access to thousands of researchers around the country, and accelerate the pace of scientific discoveries.

NSF investments support and develop S&E talent. In FY 2018, the agency directly supported approximately 386,000 researchers, graduate and undergraduate students, postdoctoral fellows, trainees, as well as K-12 teachers and students. Collectively, NSF-funded researchers have won 236 Nobel Prizes in physics, chemistry, physiology, medicine, and economics, including six Nobel laureates in 2018. In addition, among the 2018 MacArthur Fellows, seven were supported by NSF funding at some point in their careers, including the winner of NSF's 2018 Alan T. Waterman Award.

As societies around the world transition to more knowledge-based economies, our global standing increasingly relies on a skilled workforce. I am proud of the multiple opportunities NSF's education and training portfolio provides to enrich educational experiences for all students and to develop science, technology, engineering, and mathematics (STEM) talent needed for the 21st century. These opportunities challenge students to exceed expectations and help direct future career choices. NSF strives to ensure that students from all sectors of our society have access to exemplary learning experiences. NSF INCLUDES, one of our Big Ideas, is broadening participation in the STEM workforce. In 2018, NSF initiated the Hispanic-serving Institution program to increase retention and graduation rates. This initiative joins other capacity-building programs like the Tribal Colleges and Universities program, the Community College Innovation Challenge, and the Historically Black Colleges and Universities program.

With the publication of the FY 2018 Agency Financial Report, I am pleased to report that NSF received its 21st consecutive unmodified opinion from an independent audit of its financial statements. The Independent Auditors' Report identified no material weaknesses or significant deficiencies. In addition, NSF provides reasonable assurance that the agency is in compliance with the Federal Managers' Financial Integrity Act, and that internal control over financial reporting is operating effectively to produce reliable financial reporting.

For more information on NSF's performance management process and the complete results of our FY 2018 annual goals under the Government Performance and Results (GPRA) Modernization Act of 2010, I invite you to read NSF's Annual Performance Report, which we will release with NSF's FY 2020 Budget Request to Congress. In keeping with government-wide requirements, NSF's GPRA data are subject to rigorous verification and validation by an independent, external management consultant, based on guidance from the U.S. Government Accountability Office.

In closing, I would like to highlight NSF's commitment to maintaining the highest standards of integrity. In 2018, NSF was at the forefront among federal agencies in taking a firm stance against all forms of harassment and sexual assault among its staff and anywhere NSF-funded S&E is conducted. NSF works to build and sustain public trust in our operational and fiduciary responsibilities by using forward-looking risk management practices and by maintaining effective internal controls that provide transparency and accountability. With the support of the American people, NSF-funded researchers will continue to transform the world with their ingenuity and creativity and provide new knowledge and innovations that will propel our economy, enhance our lives, and secure our Nation.

/s/
France A. Córdova

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