Testimony of Research!America to the Senate Committee on Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies Concerning FY22 Appropriations for NSF
Submitted for the Record, June 21, 2021
Contact: Ellie Dehoney, Vice President of Policy and Advocacy, Research!America, edehoney@researchamerica.org

Research!America appreciates the opportunity to submit testimony for the record. We are the nation’s largest nonprofit alliance advocating for science, discovery, and innovation to achieve better health for all. We greatly appreciate the Subcommittee’s dedicated stewardship over funding for such critical priorities as the National Science Foundation (NSF). As you consider fiscal year 2022 (FY22) allocations, we request that NSF receive at least $10.2 billion, an increase of 20 percent, in FY22 to create jobs, support sustained economic growth, and bolster the wellbeing of Americans and people around the globe.

An increase of that amount aligns with the President’s FY22 request for NSF. We agree that bolstering our science and technology (S&T) capability is essential to fueling innovation and discovery that can improve the Americans’ lives and lift our knowledge to new heights.

In that context, we are grateful to both parties in both chambers of Congress for pursuing legislation to greatly enhance our S&T strength and competitiveness. The NSF for the Future Act and U.S. Innovation and Competition Act are indicative of a forward-thinking approach to tackling threats - existing, emergent, and unknown - to Americans and individuals across the globe.

NSF’s portfolio is intentionally diverse because science investment can yield unknown discoveries, spanning biology, economics, engineering, mathematics, computational science, data analytics, the social and behavioral sciences, and other high impact disciplines. We strongly believe that robust funding for NSF is a sound strategy for advancing the United States’ strategic interests in an ever-more complex international landscape, preempting and overcoming threats to our nation and world, and for meeting the aspirations of the American people.

What the NSF Provides
The NSF is a key driver for our nation’s S&T leadership, supporting strategically important research at more than 1,900 academic institutions in all fifty states, the District of Columbia, and three U.S. territories. An estimated 313,000 students, teachers, researchers, and postdoctoral fellows were empowered by the NSF in FY20. Approximately 95 percent of NSF funding is allocated to grants or cooperative agreements to researchers through a competitive merit review process. Since 1950, NSF has supported more than 248 Nobel Prize winners, including seven Nobel Laureates in 2020. The research supported by NSF bears on virtually every sector of our economy, supports cyber- and other crucial areas of national security, and factor importantly into the productive use of big data and other highly promising avenues of S&T.

NSF’s COVID Response
The NSF has been a key part of our national response to COVID-19. In March 2020, as the pandemic bore down on our nation, NSF issued a call for Rapid Response Research (RAPID) proposals to address this new health threat. By April 10, 2020, more than 60 RAPID projects
around the country were funded, supporting research related to the pandemic. For example, NSF-funded researchers modeled the spread of the virus and worked to understand transmission and prevention. Decades of NSF research investment was utilized in the response to the virus, including NSF-backed 3D printing technology for the production of PPE and computer software creating simulations to provide insight into the molecular structure of the virus.

NSF investments are also helping us prepare for future public health threats. Research in artificial intelligence and big data have the potential to identify disease threats before they spread. Other NSF-backed initiatives, like the Civic Innovation Challenge, demonstrate how partnership between government and technology can equip communities to manage emergencies.

**NSF Leverages American Ingenuity to Break New Ground in Science and Technology**
NSF supports the type of high-risk research that drives progress and has resulted in recent groundbreaking discoveries. Researchers funded by NSF have made key breakthroughs in their 20-year quest to create quantum internet with a new process by which information stored at the atomic level can be received and read. Quantum internet can be used to send “un-hackable” messages and will improve GPS, both of which are key to national security. Though this is a long-term project, the invaluable applications are unquestionably worth the time and investment.

NSF funding also made possible a smartphone app which can identify signs of eye disease in children. Using smartphone photos, the program identifies a telltale “white sheen” which can indicate retinoblastoma, as well as cataracts or an infection. Research like this forms the basis for future apps which help with early detection and diagnosis of disease.

NSF-funded research also continues to propel progress through collaboration across multiple fields. Through NSF’s continued support, scientists work together to produce cutting-edge research that pushes the fields of medicine, engineering, and biology forward. In 2019, interdisciplinary collaboration between multiple countries and more than 300 researchers allowed the Event Horizon Telescope (EHT) to capture the first image of a black hole. This discovery increased confidence in the fundamental laws of physics while creating a technological basis for future breakthroughs. Projects like this drive innovation and create, as a by-product, advances in technology and information exchange, which in turn, are used for other research.

**Americans Understand the Value NSF Delivers**
Since 1992, Research!America has commissioned national and state-level surveys to assess public sentiment on issues related to research and innovation. Our surveys have explored Americans’ perspectives on the role of NSF-funded S&T in advancing key national priorities. One of the most consistent findings over time has been Americans’ support for basic research. In our most recent survey, fielded in January 2021, 85 percent of respondents agreed that “even if it brings no immediate benefits, basic scientific research that advances the frontiers of knowledge is necessary and should be supported by the federal government.”

**NSF is Essential to Training the Next Generation of American Scientists and Innovators**
The U.S.’s global leadership is directly tied to our strength in the fields of Science, Technology, Engineering, and Mathematics (STEM). NSF cultivates future American leaders in these strategically important disciplines. Since 1952, NSF has supported more than 61,700 students
through Graduate Research Fellowships and has provided grant support to thousands of postdoctoral fellows and young investigators.

The agency has also engaged in unique public-private partnerships, including the High Performance Computing (HPC) Consortium, a partnership between IBM, the White House Office of Science and Technology Policy, the U.S. Department of Energy, and the NSF. This partnership gave researchers studying the COVID-19 virus access to powerful computational platforms which allowed for major breakthroughs in modeling COVID-19 transmission and the atomic structure of the virus. Efforts like this set the stage for future success as our nation seeks to accelerate the pace of medical and scientific progress.

Research!America appreciates the complicated and complex task facing the Subcommittee as it seeks to prioritize funding in a manner that best serves the American people. **We urge you to provide at least $10.2 billion, an increase of 20 percent, for NSF in FY22.** We hope you will call on our organization if additional information would prove useful.

Thank you for your continued leadership and consideration.

Sincerely,

Mary Woolley
President and CEO