![CNSF Coalition for National Science Funding logo]

March 14, 2019

The Honorable Jerry Moran
Chairman
Subcommittee on Commerce, Justice,
Science, and Related Agencies
Committee on Appropriations
Room S-128, The Capitol
Washington, D.C. 20510

The Honorable Jeanne Shaheen
Ranking Member
Subcommittee on Commerce, Justice,
Science and Related Agencies
Committee on Appropriations
Room S-128, The Capitol
Washington, D.C. 20510

The Honorable Jose Serrano
Chairman
Subcommittee on Commerce, Justice,
Science, and Related Agencies
H-307, The Capitol
Washington, D.C. 20515

The Honorable Robert Aderholt
Ranking Member
Subcommittee on Commerce, Justice,
Science, and Related Agencies
1016 Longworth House Office Building
Washington, D.C. 20515

Dear Chairman Moran, Ranking Member Shaheen, Chairman Serrano, and Ranking Member Aderholt:

The Coalition for National Science Funding (CNSF) – a broad-based group of professional organizations, universities, scientific societies, and businesses – appreciates Congress' continued support for the fundamental scientific research and educational programs supported by the National Science Foundation (NSF). As the fiscal year 2020 budget and appropriations process begins, CNSF would like to make two important recommendations. **_First, we strongly encourage and recommend that Congress reach a bipartisan agreement to raise the budget caps for non-defense discretionary spending._** We are sending a letter to congressional leaders on this matter. **_Additionally, we recommend a $9 billion appropriation for NSF in fiscal year 2020._**

NSF is an integral component of America's scientific research enterprise and innovation ecosystem. NSF-funded research has proven vital to the nation's economic growth, national security, and overall global competitiveness in science, technology, engineering, and mathematics (STEM) development and education. Moreover, NSF programs enable the scientific work of other federal agencies and departments, including the National Institutes of Health, the Department of Energy, NASA, and the Department of Defense. A bold approach to NSF funding is necessary in FY 2020 to provide needed support for the potentially transformational Big Ideas initiatives, protect core programs that sustain broad science and engineering fields, build and operate world-class research infrastructure, and train the future STEM workforce for the United States to remain globally competitive.

We are grateful for the appropriations the agency received in FY 2018 and FY 2019, yet we respectfully recognize that more is required to address the effects of historical underinvestment in fundamental research in the United States. According to the National Science Board, approximately $3.92 billion of cutting-edge research deemed "very good or higher" in NSF's merit criteria was unfunded in FY 2017. The potential impact of these missed opportunities is even more stark when considering the return on

investment of fundamental scientific research and the significant investments that other nations – both allies and adversaries – are making in comparable research areas.

Within this $3.92 billion in unmet STEM funding opportunities are many essential activities and areas of discovery and development. Specifically, funding for the Education and Human Resources (EHR) Directorate has stagnated for many years, leaving critical gaps in our ability to address fundamental challenges for K-12, undergraduate, and graduate STEM education. Stagnation in key U.S. talent development programs comes as our national security leaders are sounding alarm bells over foreign talent recruitment programs which are effectively siphoning STEM capacity from the United States and elsewhere to countries that are strongly investing while we remain complacent. Additionally, NSF is working to broaden participation in the STEM fields, but current funding levels are far short of what the United States needs to close the achievement gap and enable necessary progress through efforts such as INCLUDES. To ensure we have a workforce prepared to serve our present and future government, business, and academic needs, especially given global competition and national security concerns, we have no choice but to invest strongly in the NSF's EHR programs.

Current NSF funding also falls short in national priority areas such as artificial intelligence (AI), quantum information sciences, and advanced manufacturing. Late last year, there was bipartisan and bicameral support for the enactment of H.R. 6227, the National Quantum Initiative Act. The legislation correctly called for continued federal support for maximizing the nation's quantum research and capabilities. Specifically, the legislation called for the establishment of five new NSF-funded quantum centers and continued support for existing NSF-funded quantum research. Likewise, the White House and Congress are also championing increased support for AI and advanced manufacturing at the NSF. The scale of need in these critical priority areas far outpaces NSF's current resource level. For example, NSF's core AI-focused program recently received $170 million worth of high-quality proposals, while the entire division budget within which the program sits is only $120 million. Simply put, without growth, NSF cannot balance these critical investments with its broad support of core research across disciplines.

In addition to research and education, NSF faces dramatic unmet infrastructure needs. A 2017 Request for Information on mid-scale research infrastructure returned $8 billion worth of infrastructure ideas, of which $2 billion were deemed transformational to U.S. science and engineering. NSF's FY 2019 request for mid-scale research proposed $60 million, addressing a tiny fraction of mid-scale needs. NSF's pipeline for major construction projects has also dried up as funding stagnation caused several years of deferred planning for large facilities. Past investments in these facilities have led to incredible discoveries and the creation of whole new fields of science such as gravitational wave astronomy. NSF must have the resources available to build the next great generation of facilities to continue U.S. leadership.

While we have highlighted a few of the important underfunded priorities that represent potential missed opportunities, a focus on these examples must be additive and cannot result in neglect of other science fields, lest we find ourselves in a similar situation with these other areas of research down the road. The ongoing work of supporting essential research across all scientific disciplines, from physical sciences to social and behavioral sciences, from nanotechnology to large-scale infrastructure, and disciplinary and multi-disciplinary research, continues to be the bedrock of NSF's mission.

NSF faces enormous unmet funding needs due to a cumulative stagnation over many years. As a first step to address these needs, we urge an appropriation of **$9 billion for NSF** in FY 2020.

Sincerely,
The Coalition for National Science Funding (CNSF)

Acoustical Society of America
American Anthropological Association
American Association for Dental Research
American Association of Geographers
American Association of Physicists in Medicine
American Association of Physics Teachers
American Astronomical Society
American Chemical Society
American Educational Research Association
American Geophysical Union
American Geosciences Institute
American Institute for Medical and Biological Engineering
American Institute of Physics
American Mathematical Society
American Physiological Society
American Phytopathological Society
American Political Science Association
American Psychological Association
American Society for Biochemistry & Molecular Biology
American Society for Engineering Education
American Society for Microbiology
American Society of Civil Engineers
American Society of Mechanical Engineers
American Society of Plant Biologists

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Council on Undergraduate Research
Duke University
Ecological Society of America
Entomological Society of America
Eversole Associates
Federation of American Societies for Experimental Biology
Federation of Associations in Behavioral & Brain Sciences
Florida State University
Geological Society of America
George Mason University
Georgetown University
Georgia Institute of Technology
Harvard University
Human Factors and Ergonomics Society
IEEE-USA
Illinois Institute of Technology
Incorporated Research Institutions for Seismology
Indiana University
Knowledge Alliance
Lehigh University
Lewis-Burke Associates LLC
Linguistic Society of America
Massachusetts Institute of Technology
Materials Research Society
Mathematical Association of America
Michigan State University
Michigan Technological University
Museum of Science, Boston
National Association of Marine Laboratories
National Communication Association

National Postdoctoral Association
National Science Teachers Association
Northern Illinois University
Northwestern University
Pennsylvania State University
Population Association of America/ Association of Population Centers
Princeton University
Psychonomic Society
PsySiP Project
Research! America
Rutgers University-New Brunswick
SAGE Publishing
Saint Louis University
Seismological Society of America

Society for Advancement of Chicanos/Hispanics and Native Americans in Science
Society for Industrial and Applied Mathematics
Society for Neuroscience
Society for Research in Child Development
Society for the Psychological Study of Social Issues
Stevens Institute of Technology
Stony Brook, The State University of New York
The Ohio State University
The State University of New York System
The University of Wisconsin-Madison
University Corp for Atmospheric Research
University of California System

University of California, Los Angeles
University of California, San Diego
University of Colorado Boulder
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University of Illinois System
University of Iowa
University of Maryland, College Park
University of Michigan
University of Oregon
University of Pennsylvania
University of Pittsburgh
Vanderbilt University
Washington State University
Washington University in St. Louis
West Virginia University
Woods Hole Oceanographic Institution

Cc: Senator McConnell, Senator Schumer, Senator Shelby, Senator Leahy, Representative Pelosi, Representative McCarthy, Representative Lowey, Representative Granger