

**OPEN LETTER TO THE CONGRESS AND PRESIDENT OF THE UNITED STATES**  
**Nobel Laureates and Science Community Leaders Comment on**  
**Harm to American Science from the Shutdown**

February 11, 2019

Dear Mr. President and Members of Congress:

As American scientists—researchers, teachers, heads of major national scientific societies and institutes, and Nobel Laureates—we are writing to call attention to the harm done to the US scientific enterprise by the recently ended partial shutdown of the federal government. The disruptions caused by the shutdown have consequences that will extend well beyond the shutdown, with the potential to affect many aspects of our society, including our economy, security, health, and international competitiveness.

For decades, the US has led the world in basic scientific research. Our strength in fundamental research gave birth to the military technology that helped to end World War II and continues to safeguard us and our allies. Our past global scientific dominance fueled the technological innovations that have made our economy the strongest in the world. A critical component of that leadership was, and continues to be, sustained federal investment in basic research.

Today, in a trend starting long before the recent disruption, our scientific leadership is threatened by other countries whose investment in research is growing more rapidly than our own. The government shutdown closed some of the agencies most crucial to the maintenance of our leadership and of the health of American science. The National Science Foundation (NSF) funds much of the basic research in our universities. The National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the National Institute of Standards and Technology (NIST), and others produce fundamental research leading to innovations that improve our daily lives, our security, and our economy. Even the temporary loss of those activities has a profoundly disruptive effect on experimental work and the functions of research teams at a time when American scientific leadership is challenged by China and other international competitors.

Make no mistake: although the shutdown's effect on science will not be as immediately evident as were the long airport security lines, flight delays, and missing paychecks for federal employees, the effects will be longer lasting and more widespread. Major science agencies like the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and the Department of Energy (DOE), which already had their funding approved and did not shut down, nevertheless felt the effects because important connections and collaborations with scientists supported by the shuttered agencies were put on hold. And scientists at non-government institutions, such as universities and research institutes, were impeded by the absence of staff at federal agencies that support their work.

Science is essential to our technological society. The development of advanced materials and devices, new medical treatments, worldwide communication technologies, new energy sources, GPS navigation with our smartphones — essentially all the technologies used by modern

societies — were enabled by federal support for fundamental science. Future advances will depend on additional programs, such as the newly enacted National Quantum Initiative, designed to change the landscape of military and commercial capabilities. But during the shutdown much of the new quantum research could not even begin, while China and Europe continued to develop the new quantum technology at full speed. Similarly, while NASA had to suspend some of its efforts to explore space, other countries continued their programs to plant probes in previously unexplored parts of our universe. Of even greater long-term consequence, the interruption of the careers of young researchers has likely caused some to question their future involvement in our national scientific adventure.

We write to you now, at a time when another possible government shutdown looms, to draw your attention to the detrimental consequences of even short-term suspensions of federal funding on the nation's scientific enterprise. We are encouraged by discussions of proposals that would protect science, among other critical activities, from the significant disruptions that occur during shutdowns of appreciable length, and we urge the avoidance of such lapses. Shutting down parts or all of the federally funded scientific enterprise, which enjoys support across the entire political spectrum, serves only our foreign competitors. Continued strong support for science benefits us all.

Yours respectfully,

#### **Nobel Laureates**

Frances H. Arnold  
Nobel Laureate, Chemistry 2018

David Baltimore  
Nobel Laureate, Physiology or Medicine, 1975

J. Michael Bishop  
Nobel Laureate, Physiology or Medicine, 1989

Michael S. Brown  
Nobel Laureate, Medicine or Physiology, 1985

Steven Chu  
Nobel Laureate, Physics, 1997  
President-elect, American Association for the  
Advancement of Science

Robert Curl  
Nobel Laureate, Chemistry, 1996

Joseph Goldstein  
Nobel Laureate, Physiology or Medicine, 1985

Carol Greider  
Nobel Laureate, Physiology or Medicine, 2009

David Gross  
Nobel Laureate, Physics, 2004 President,  
American Physical Society

Robert H. Grubbs  
Nobel Laureate, Chemistry, 2005

Robert Horvitz  
Nobel Laureate, Physiology or Medicine, 2002

Brian Kobilka  
Nobel Laureate, Chemistry, 2012

Roger D. Kornberg  
Nobel Laureate, Chemistry, 2006

W. E. Moerner  
Nobel Laureate, Chemistry, 2014

William D. Phillips  
Nobel Laureate, Physics, 1997

Randy Schekman  
Nobel Laureate, Physiology or Medicine, 2013

Richard R. Schrock  
Nobel Laureate, Chemistry, 2005

Harold E. Varmus  
Nobel Laureate, Physiology or Medicine, 1989

David J. Wineland  
Nobel Laureate, Physics, 2012

### Science Community Leaders

Bruce M. Alberts  
Former President, National Academy of Sciences

Juliane Baron  
Executive Director, Federation of Associations in Behavioral and Brain Sciences

Sarah Brookhart  
Executive Director, Association for Psychological Science

Mary Sue Coleman  
President, Association of American Universities

Thomas M. Connelly Jr.  
CEO, American Chemical Society

Rush D. Holt  
CEO, American Association for the Advancement of Science

Laura F. Huenneke  
President, Ecological Society of America

Nancy Kidd  
Executive Director, American Sociological Association

Kate Kirby  
CEO, American Physical Society

Edward T. Morgan  
President, American Society for Pharmacology and Experimental Therapeutics

Erin O'Shea  
President, Howard Hughes Medical Institute

Kent Rochford  
CEO, SPIE, the international society for optics and photonics

Catherine Roberts  
Executive Director, American Mathematical Society

Elizabeth Rogan  
CEO, The Optical Society (OSA)

Erika C. Shugart  
CEO, American Society for Cell Biology

Keith L. Seitter  
Executive Director, American Meteorological Society

Shirley M. Tilghman  
President Emerita, Princeton University

Jamie L. Vernon  
Executive Director and CEO, Sigma Xi, The Scientific Research Honor Society

Mary Woolley  
President and CEO, Research!America

Milan P. Yager  
Executive Director, American Institute for Medical and Biological Engineering