



## ENERGY SCIENCES COALITION

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April 23, 2021

The Energy Sciences Coalition (ESC) thanks Congress for continuing its strong, bipartisan support of the U.S. Department of Energy (DOE) Office of Science in the fiscal year (FY) 2021 appropriations bill (H.R. 133). **ESC urges Congress to appropriate at least \$7.7 billion in FY 2022 for DOE Office of Science, an increase of 9.6 percent above FY 2021.** This level of funding is needed to maintain a funding trajectory that ensures continued support for groundbreaking scientific discoveries, building and operating world-class scientific facilities, helping advance energy technologies needed for the nation to meet net-zero carbon emissions economy wide, developing Industries of the Future and emerging technologies, and maintaining the highly skilled science and technology workforce that is essential for the United States to compete globally.

As the nation's primary sponsor of physical sciences research, Office of Science plays a vital role in the American scientific ecosystem – a proven model for success in discovery and innovation. DOE Office of Science sponsors research programs vital to American prosperity and security at research universities and national laboratories and helps maintain the U.S. pipeline of science and engineering talent. DOE Office of Science is also unique among federal science agencies, supporting the network of 17 DOE national laboratories—the crown jewels of the nation's research and innovation ecosystem— and directly stewarding ten of them. DOE Office of Science also builds and operates the most sophisticated, world-class scientific user facilities used by research universities, industry and most federal agencies.

Another unique feature is science at scale. DOE Office of Science has a long history of combining the talent and capabilities of the national laboratories' unique science facilities, the country's leading research universities, and industry to bring together multi-disciplinary teams to tackle fundamental science, energy, and national security grand challenges. The most recent examples are the national quantum information science research centers and the nation's response to COVID-19. In response to COVID-19, DOE Office of Science established multi-disciplinary teams from all 17 national labs to address critical needs, such as improving capabilities for and ensuring effective detection of infection and expediting discovery of therapeutic drugs, including antibodies and antivirals, to complement vaccine development.

Bold new investments in fundamental research are needed to stay ahead of international competition, maintain U.S. competitiveness, and create American jobs of the future in key energy sectors as well as new technology areas such as high-performance computing, quantum information science, artificial intelligence, biotechnology, ultrafast lasers, and optical detectors. In particular, scientific breakthroughs and energy technology innovation are still necessary to decarbonize the U.S. economy and mitigate the worst effects of climate change. Office of Science-supported fundamental research forms the foundation for future energy technologies. The current imperative—energy systems that meet our energy security, economic, and environmental challenges—requires continued, robust investments in all areas of fundamental research to advance all energy systems, including energy storage, negative emission technologies, advanced nuclear, hydrogen, fusion, renewables such as wind and solar, carbon capture, storage and utilization, and next-generation fuels.

*The Energy Sciences Coalition (ESC) is a broad-based coalition of organizations representing scientists, engineers and mathematicians in universities, industry and national laboratories who are committed to supporting and advancing the scientific research programs of the U.S. Department of Energy (DOE), and in particular, the DOE Office of Science.*

Specifically, ESC's funding recommendation is needed to:

- grow core research at national laboratories and research universities in the physical sciences, biological sciences, advanced materials, geosciences, computing and engineering to help develop future energy technologies and fully utilize new and updated world-class facilities and cutting-edge instrumentation, especially with ambitious goals to achieve net-zero emissions economy-wide no later than 2050;
- prepare the next generation of American scientific and engineering talent through competitively awarded grants and significantly expand existing workforce and education programs, such as the DOE Office of Science Graduate Fellowship and Computational Sciences Graduate Fellowship, while also creating new programs to address the nation's growing workforce needs in STEM and energy industries as well as meaningfully tackle issues of broadening participation and diversity, equity, and inclusion;
- accelerate the construction and upgrades of world-class scientific user facilities and maximize operations to support the more than 36,000 researchers from academia, industry and federal agencies that rely on these facilities for their science and engineering pursuits;
- advance new, strategic investments in innovative high-risk, high-reward research areas, such as quantum science and technology; artificial intelligence and scientific machine learning; genomics, biotechnology, and other convergence science; microelectronics; next-generation communications; accelerator and laser systems; and optical detectors, and
- maintain and grow multi-disciplinary centers focused on addressing scientific grand challenges, such as Energy Frontier Research Centers, Bioenergy Research Centers, Energy Innovation Hubs, and national quantum information science research centers as well as artificial intelligence co-design and microelectronics research centers.

To help guide these investments, ESC strongly recommends following the advice on research priorities and infrastructure investments of the six DOE Office of Science federal advisory committees. Since their inception, the Office of Science advisory committees have provided valuable, independent advice on complex scientific and technical issues and they have been essential for engaging the scientific community in open and transparent processes related to user facility planning, assessment, ranking and prioritization. They also help establish consensus across the scientific community on research priorities and goals. Recent examples include the fusion energy and plasma science long-range plan and recommendations on a future U.S. domestic high-performance reactor-based research facility for materials research and other applications.

The United States must maintain its leadership in science, technology and innovation, and the DOE Office of Science plays a pivotal and leading role in addressing this country's energy, national security, and environmental challenges. For these reasons, we urge Congress to provide at least \$7.7 billion for DOE Office of Science in FY 2022. We look forward to working with you in advancing the critical missions of the DOE Office of Science.

Sincerely,

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## Signatory Organizations

American Association for the Advancement of Science  
American Association of Physicists in Medicine  
American Association of Physics Teachers  
American Astronomical Society  
American Chemical Society  
American Crystallographic Association  
American Geophysical Union  
American Geosciences Institute  
American Institute of Physics  
American Mathematical Society  
American Nuclear Society  
American Physical Society  
American Society for Engineering Education  
American Society of Agronomy  
Acoustical Society of America (ASA)  
American Society of Mechanical Engineers  
American Society for Microbiology  
American Society of Plant Biologists  
American Vacuum Society  
Arizona State University  
Association of American Universities  
Association of Public and Land-grant Universities  
AVS – The Society for Science and Technology of  
Materials, Interfaces, and Processing  
Battelle  
Bay Area Science and Innovation Consortium  
Berkeley Chamber  
Binghamton University  
Bioenergy Association of America  
Biophysical Society  
Boston University  
The California Council on Science and Technology  
Case Western Reserve University  
City College of CUNY  
Clemson University  
Coalition for Academic Scientific Computation (CASC)  
Consortium for Ocean Leadership  
Columbia University  
Computing Research Association  
Council of Scientific Society Presidents  
Cornell University  
Cray Inc.  
Crop Science Society of America  
Duke University  
East Bay Economic Development Alliance  
The Ecological Society of America  
Federation of American Societies for Experimental Biology  
Florida State University  
Fusion Power Associates  
General Atomics  
Geological Society of America  
George Mason University  
Georgia Institute of Technology  
Grid Alternatives  
Harvard University  
Health Physics Society  
IBM  
IEEE-USA  
Iowa State University  
Jefferson Science Associates, LLC  
Krell Institute  
Lansing Economic Area Partnership  
Lansing Regional Chamber of Commerce  
Lehigh University  
Long Island Association  
Long Island University  
Louisiana Tech University  
Massachusetts Institute of Technology  
Materials Research Society  
Michigan State University  
Michigan Technological University  
New York University  
Northeastern University  
Northern Illinois University  
Northwestern University  
Oakland Chamber of Commerce  
Oak Ridge Associated Universities (ORAU)  
OSA—The Optical Society  
Pace University  
Penn State University  
Princeton University  
Purdue University  
Rensselaer Polytechnic Institute  
Rising Sun  
Rochester Institute of Technology  
Rutgers, The State University of New Jersey  
Silicon Valley Leadership Group  
Society for Industrial and Applied Mathematics  
Soil Science Society of America  
South Dakota School of Mines  
Southeastern Universities Research Association  
Southern Illinois University System  
SPIE  
Stanford University  
Stony Brook University  
Tech-X Corporation  
The Ohio State University  
University of California System  
University of Chicago  
University of Colorado Boulder  
University of Delaware  
University of Florida  
University of Illinois System  
University of Iowa  
University of Maryland, College Park  
University of Michigan  
University of Missouri System  
University of Nebraska  
University of North Texas  
University of Oklahoma  
University of Pennsylvania  
University of Rochester  
University of Southern California  
University of Tennessee  
University of Texas at Austin  
University of Virginia  
University of Wisconsin-Madison  
Vanderbilt University  
Washington State University  
West Virginia University  
Yale University

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