



An association of 62 leading
public and private research universities

DEPARTMENT OF ENERGY RESEARCH

AAU RECOMMENDS \$5.34 BILLION FOR THE DOE OFFICE OF SCIENCE IN FY16

This funding level would provide a 5.4 percent increase for the DOE Office of Science, keeping its budget essentially constant after accounting for inflation. The \$5.34 billion funding level is vital for the Office of Science to maintain support for its core scientific research programs and scientific user-facility operations. This will help increase the available run-time of major DOE scientific facilities, allowing increased access to and use of these facilities by university researchers. AAU urges Congress to reject any proposed cut to the Office of Fusion Energy Sciences, while maintaining strong support for other Office of Science programs.

AAU SUPPORTS \$325 MILLION FOR ARPA-E IN FY16

Modeled after DARPA, ARPA-E is working to ensure the nation's energy security. ARPA-E supports high-risk, high-reward research that private industry will not conduct. Since 2009, ARPA-E has funded more than 380 projects in 38 states. Forty percent of these awards have been made to universities, and another significant portion has supported research at university-based startups. Seventeen of these projects alone have attracted more than \$450 million in private sector capital following ARPA-E's initial investment of about \$70 million. Funding ARPA-E at \$325 million would allow the agency to continue making awards to university-based researchers for high-risk projects that are too far from product development to be supported by industry and not likely to be funded by other parts of the DOE, but which have the potential for real breakthroughs in the future.

Strong and predictable funding for the DOE Office of Science is vital to closing the innovation deficit and keeping the U.S. at the forefront of research in the physical and biological sciences, energy, computing, and other areas of science and engineering too risky for U.S. industry to support.

The Advanced Research Projects Agency-Energy (ARPA-E) is supporting high-risk, high-reward research at U.S. universities that has the potential to dramatically change how we acquire energy in the future.

CONGRESS SHOULD MAKE DOE SCIENCE FUNDING A PRIORITY IN FY16

Strong and sustained funding for DOE Science that at least keeps pace with inflation is needed to maintain U.S. scientific leadership; ensure continued U.S. innovation, competitiveness, and energy security; and help close the nation's innovation deficit. Funding the DOE Office of Science at \$5.34 billion will allow it to:

- maintain its existing core research programs, such as ARPA-E, the Energy Frontier Research Centers program, and Energy Innovation Hubs;
- preserve the Fusion Energy Sciences program; and
- reduce the impact of transitioning to forward funding of grants under \$1 million, which would otherwise temporarily reduce success rates and/or the number of grants in certain DOE programs available to university researchers.

DOE OFFICE OF SCIENCE RESEARCH HAS PLAYED AN INTEGRAL ROLE IN THE DEVELOPMENT OF IMPORTANT TECHNOLOGIES

- MRI machines and PET scans;
- new composite materials for military hardware and motor vehicles;
- medical and industrial isotopes;
- DNA sequencing technologies;
- more fuel efficient trucks and automobiles;
- electric vehicle battery technology;
- more efficient and safer nuclear reactor designs;
- 3-D models of pathogens for vaccine development; and
- improved scanners and detectors for biological, chemical, and radioactive materials.

DOE PLAYS A CRITICAL ROLE IN ADVANCING U.S. SCIENCE AND ENERGY FRONTIERS

DOE is the leading source of federal funds and facilities for physical sciences research. In subfields such as high energy and nuclear physics, nuclear medicine, heavy-element chemistry, plasma physics, magnetic fusion, and catalysis, DOE is the primary government sponsor. The DOE also ranks high among federal agencies in overall support for computer science and engineering research and operates large scientific user-facilities critical to advancing the biological and environmental sciences. The Office of Science, specifically, is advancing the basic science required to produce cellulosic ethanol and other biofuels cheaply and efficiently. It is also supporting scientific research vital to future U.S. energy needs in areas such as magnetic fusion, hydrogen fuel cells, materials research, electric vehicle batteries, energy storage, and renewable energy sources.

DOE RESEARCH FACTS

- **DOE user facilities are a unique scientific resource.** Located at universities and national laboratories around the country, these facilities include large particle accelerators, experimental reactors, high-precision instruments, synchrotrons/light sources, massively parallel computers, and high-resolution microscopes. Nearly half of the users are university investigators researching questions of basic science. Other users—from industry, the national laboratories, and other federal agencies—use the facilities to support the creation of new products. Such products include new pharmaceuticals, advanced materials for semiconductors and vehicular batteries, telecommunications satellites, and consumer goods. If not for DOE, these vital scientific facilities would not exist in the United States.
- **The Office of Science is the single largest supporter of basic research in the physical sciences in the United States,** providing approximately 47 percent of total funding and central to supporting key components of the nation's basic research efforts in biology and computing.
- **DOE provides crucial support for university research and students.** The DOE Office of Science supports a diverse portfolio of research at colleges and universities nationwide. The Office sponsors about 50 percent of all university physics research and supports more than 22,000 Ph.D. scientists, graduate students, undergraduates, engineers, and support staff at more than 300 institutions. DOE-funded research and education programs play a key role in strengthening the nation's scientific knowledge base and preparing the next generation of scientists and engineers. *March 2015*

Boston University ★ Brandeis University ★ Brown University ★ California Institute of Technology ★ Carnegie Mellon University ★ Case Western Reserve University ★ Columbia University ★ Cornell University ★ Duke University ★ Emory University ★ Georgia Institute of Technology ★ Harvard University ★ Indiana University ★ Iowa State University ★ The Johns Hopkins University ★ Massachusetts Institute of Technology ★ McGill University ★ Michigan State University ★ New York University ★ Northwestern University ★ The Ohio State University ★ The Pennsylvania State University ★ Princeton University ★ Purdue University ★ Rice University ★ Rutgers, The State University of New Jersey ★ Stanford University ★ Stony Brook University – State University of New York ★ Texas A&M University ★ Tulane University ★ The University of Arizona ★ University at Buffalo, The State University of New York ★ University of California, Berkeley ★ University of California, Davis ★ University of California, Irvine ★ University of California, Los Angeles ★ University of California, San Diego ★ University of California, Santa Barbara ★ The University of Chicago ★ University of Colorado, Boulder ★ University of Florida ★ University of Illinois at Urbana-Champaign ★ The University of Iowa ★ The University of Kansas ★ University of Maryland, College Park ★ University of Michigan ★ University of Minnesota, Twin Cities ★ University of Missouri-Columbia ★ The University of North Carolina at Chapel Hill ★ University of Oregon ★ University of Pennsylvania ★ University of Pittsburgh ★ University of Rochester ★ University of Southern California ★ The University of Texas at Austin ★ University of Toronto ★ University of Virginia ★ University of Washington ★ The University of Wisconsin-Madison ★ Vanderbilt University ★ Washington University in St. Louis ★ Yale University