

High-Energy Physics Is a National Effort

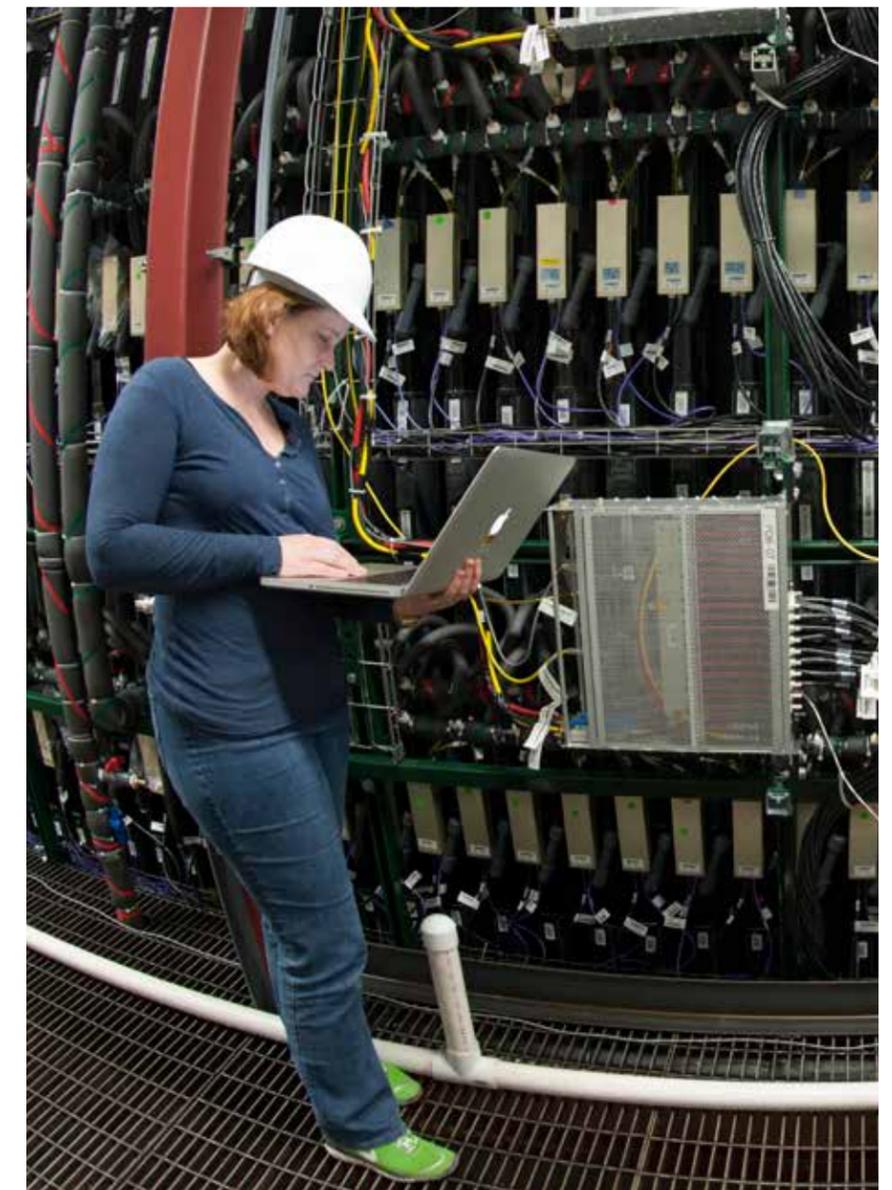
Scientists, engineers, and technicians at **more than 160 universities and laboratories in 42 states and Puerto Rico** partner with their international colleagues to build high-tech tools and components, conduct scientific research, and train and educate the next generation of innovators. High-energy physics facilities at laboratories in the United States attract more than 4,000 scientists from around the world every year.



1. More than 1,700 U.S. scientists and students drive science forward through experiments at the Large Hadron Collider in Geneva, Switzerland, including using the CMS experiment.
2. High-energy physics partners with other scientific fields and agencies like NASA to push the boundaries of research through experiments including the Fermi Gamma-ray Space Telescope.
3. The United States is a leader in the study of neutrinos, mysterious particles that may help explain why the universe has evolved to the form we know today. New technologies such as innovative large-scale liquid argon detectors are being developed to study neutrinos.
4. Computing tools and distribution systems created to process and analyze high-energy physics data have found their way into many areas of industry and society.
5. National laboratories work with industry to train workers and develop manufacturing capabilities, such as building components for the next generation of particle accelerators.

Accelerating National Innovation

High-Energy Physics in the United States

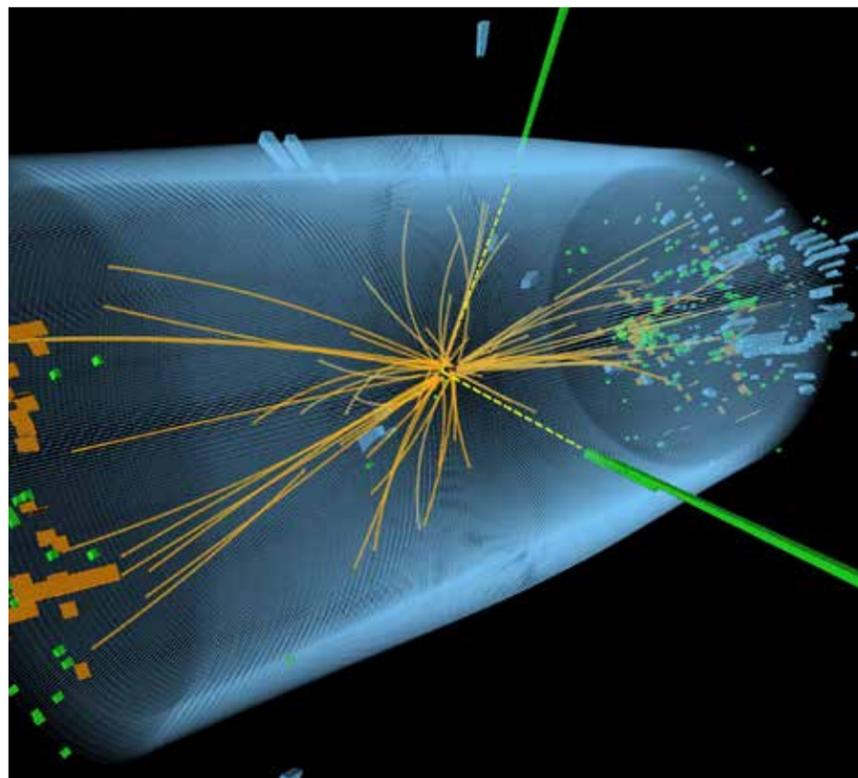


U.S. high-energy physics research is supported by the Department of Energy's Office of Science and the National Science Foundation.

Exploration that Propels U.S. Progress

The challenge of high-energy physics is to discover what our world is made of and how it works. Particle physics, the science of the very small, teams up with astrophysics and cosmology, the sciences of the very large, to explore the undiscovered universe from the tiniest particles to the outer reaches of space.

The quest to better understand our world inspires and educates tens of thousands of students across the country and creates a globally competitive, highly trained workforce in the United States. Advanced research and development (R&D) for the tools of **high-energy physics drives innovation that improves the nation's health, wealth, and security.**



Leading the World to New Discoveries

America's high-energy physics research program positions U.S. scientists to make the next generation of discoveries at home and abroad. **U.S. university and national laboratory researchers lead in the global search for answers to some of humankind's biggest questions:**

What are the building blocks of matter and the fundamental forces of nature? High-energy physicists from the United States lead the way in the quest to understand the Higgs boson and to search for other new particles and forces.

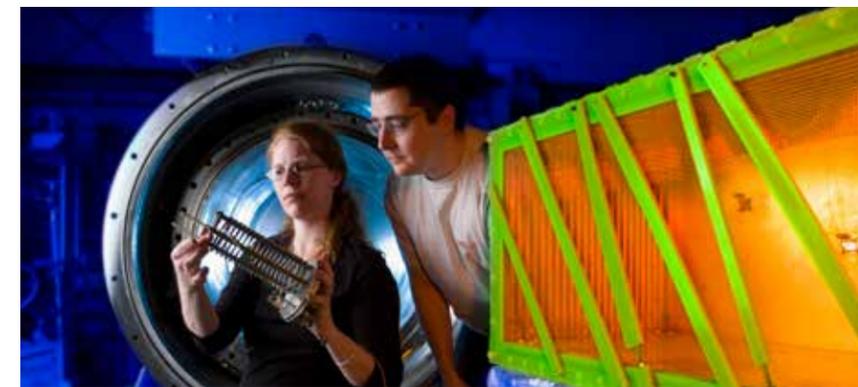
How did the universe develop into what we see today? Pioneering research with powerful beams of neutrinos produced at Fermilab may uncover the mysteries of the dynamics of the early universe.

What makes up the 96 percent of the universe we can't see? We understand only four percent of our universe. U.S. scientists lead pioneering Earth- and space- based experiments to search for the dark matter and dark energy that could explain the rest.



Providing Tools for STEM Education

Every year high-energy physics programs at more than 100 universities and five national laboratories give **tens of thousands of U.S. students hands-on learning experiences in science, math, computing, and engineering.** Students, scientists, engineers, and technicians trained in the cutting-edge science of high-energy physics give the U.S. workforce an edge in the high-tech global economy.



Driving Innovation with High-Energy Physics

High-energy physics discoveries require powerful research tools. These bold and innovative technologies have entered the mainstream of society to transform the way we live and do business. More than 30,000 particle accelerators are in use worldwide in industries including **medicine, manufacturing, and material processing.** The Department of Energy's Office of High-Energy Physics is the designated steward of the nation's program for particle accelerator R&D.

Why Particle Physics Matters

Learn more about what motivates high-energy physicists:



How high-energy physics changes your life:

