
Photo by Reidar Hahn

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There are few today who would question the critical importance of basic scientific research. America's leadership in basic science sows the seeds of our future prosperity, ennobles our society with a higher purpose, and provides a common ground for peaceful cooperation with other nations. We depend upon basic science as a resource, mined from an inexhaustible mother lode of knowledge. The federal government acts as the primary custodian of this resource, ensuring a balanced and refined supply, freely shared by all.

High-energy physics has qualities and value that make it unique among the branches of basic science. Only high-energy physics seeks to articulate the fundamental character of physical law, and to identify the primary agents and constituents of physical reality. Physical events play out upon an underlayment of interwoven fields of energy and matter. High-energy physicists tug at the microscopic knots of this cosmic weave. They divine the symmetries that give it order and elegance, and untangle the dense woof of its complex dynamics.

This is the science of extremes: the smallest, the largest, the hottest, the densest, the most energetic. Ghostlike neutrinos stream through the earth and leave no effect, but quarks are trapped in tiny prisons by powerful nuclear glue. Some particles, left undisturbed, will live forever, but others wink in and out of existence in the most fleeting of moments. Gravity reaches across the universe to corral whole galaxies, while the weak force cannot even reach across a proton to grab a quark.

High-energy physics, more than any other human enterprise, tests the limits of our imaginations and the rigors of our intellects. Its role in science is not only to probe the nature of matter, energy, space, and time, but also to inspire young people with the sweep and depth of scientific endeavor. As a leader in high energy physics, the United States can more easily remain preeminent in science as a whole.

The spectacular progress in high-energy physics of the past half century has made this the most advanced and best tested of all scientific disciplines. This progress has also increased the expense and complexity of the U.S. program. But the money we spend is primarily an investment in people: thousands of highly-trained experimenters, theorists, students, accelerator physicists, computer scientists, technicians and engineers. U.S. high-energy physicists add to the intellectual vigor of a hundred universities, while our high-energy physics laboratories are magnets for the best minds from around the world.

High-energy physicists, by definition, work at the most far-flung frontiers of human knowledge. For each frontier settled, two new ones open up. In this sense, high-energy physics is a challenge particularly suited to the American spirit. To give up our leadership on these frontiers is to deny the bold ambitions, restless energies, and nimble ingenuity that have brought us so much success. If we go forward, there is no limit to what we can learn, and no limit to how this knowledge may affect our future. ■