

US budget cuts threaten scientific research

Nicholas Russo
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Over the past decade, the combined effort of the international scientific community has yielded amazing advances in our understanding of the world. This research has culminated in the development of tools that allow unprecedented future progress in fields as varied as physics, engineering, biology, medicine, agriculture, communications, and manufacturing.

Among these achievements can be included the Large Hadron Collider (LHC), the world's largest and highest energy particle accelerator. Constructed over the course of a decade, this massive facility 17 miles in circumference opens the door to physics experiments on a grand scale that could allow physicists to study exotic particles such as the Higgs boson or even dark matter and reveal the nature of the fundamental underpinnings of our universe.

In the realm of astrophysics, the launching of NASA's Kepler space telescope in May 2009 has already yielded the discovery of more than 1,000 candidate planets orbiting more than 900 stars, including 54 planets in their star's habitable zone. This satellite is searching for planets surrounding more than 145,000 stars, and opens the possibility of discovering Earth-like planets elsewhere in our galaxy.

In biology and medicine, the decoding of the human genome in 2003 (the culmination of a 13-year international effort) and new technology allowing the sequencing of individual genomes for as little as \$4,400 (with a goal of as little as \$1,000 per genome by 2013) allow a new era of disease research and personal medicine that opens up the possibility of diagnosing and treating diseases such as cancer or depression with minimal side-effects and maximum effectiveness.

In agriculture, the development of genetically modified crops allows reduced use of pesticides and fertilizers while increasing yield and opens the possibility of massively increasing food production to feed millions of starving people in America and around the globe.

In addition, research in nanotechnology offers the possibility of revolutionizing multiple fields including medicine, chemistry, computing, and manufacturing.

It is clear that government investment and international cooperation over the past decade have opened a new era in human progress. Science and research offer the possibility in the 21st century of eliminating poverty and hunger, ending suffering and disease, and leading to unprecedented understanding of our universe. Despite this amazing promise, scientists around the world are finding themselves threatened by the same cuts that are currently threatening to lower the quality of education and the living standards of working people around the globe.

Physicists at the Large Hadron Collider are facing budget cuts that threaten to stall their research. This is laid out by a British physicist in an article from physicsworld.com: "We should be on a high right now," says Nick Brook of Bristol University, who has worked on the LHCb experiment for more than 10 years. "Instead we're facing an up-hill struggle whereby we have to convince our paymasters that already agreed and peer-reviewed scientific goals are worth continued investment."

In America, budget cuts could lead to layoffs of more than 3,000 workers and scientists at the Argonne National Laboratory and Fermilab, including the permanent shutdown of Fermilab's Tevatron particle accelerator. This shutdown comes on the heels of the potential major discovery of a new subatomic particle at Fermilab. However, the necessary experiments to confirm this finding will be made impossible by the shutdown.

The situation wherein experiments deemed of high significance by scientists through the democratic, peer-review process are refused funding under the auspices of austerity is not unique to the field of physics. A 2009

editorial from the journal of the American Society for Microbiology had the following commentary: “Find two scientists together, and chances are they are complaining about grants. The American research community is presently in its sixth year of a funding crisis... Resources in the system are insufficient to support current demands for research funds, and scientists are devoting unprecedented time and effort into competing over the dwindling funds available. Robert Siliciano, a prominent virologist, testified to a Congressional committee that 60% of his time is dedicated to seeking research funding. There are simply not enough resources for the number of scientists.”

The author of the editorial asks, “Would a successful business organize its research and development department so that employees spend more than half their hours writing detailed 5-year plans and then provide resources for only a 10th of them, leaving the rest to languish? Of course not. Yet, that is essentially the status of the nation’s scientific enterprise in 2009. Over the past 5 years, the NIH budget has declined 13% after correcting for inflation.”

He goes on to point out the dire consequences of these cuts, “We must face the fact that the ongoing funding imbalance is causing lasting harm to the nation’s scientific enterprise, undermining both productivity and innovation... For some scientists, their very jobs are at stake... Additional casualties of the funding crisis are more difficult to measure but nevertheless real: deteriorating morale and a perceptible decline in scientific collegiality and cooperation.”

The 2011 budget passed by the House includes an 18 percent cut for the Office of Science and a 49 percent cut for the Office of Biology and Environmental Research, threatening to shut down laboratories across the country critical for research in fields as broad as structural biology, genome sequencing, computing, petroleum refining, bioenergy, green energy technology, and climate research.

In a recent issue of *Science* Raymond Orbach, former Under Secretary for Science in the Department of Energy for President George W. Bush, gives a dire warning, “Left intact, the massive cuts in research contained in the bill passed on 19 February would effectively end America’s legendary status as the leader of the worldwide scientific

community.” The threat to research is more severe than even the conservative Orbach suggests: world-wide cuts in research spending threaten human progress itself.

At the same time as research spending is being slashed, cuts to education in America and around the world threaten the very foundation of future research and development. In Wisconsin, the budget proposal by Republican Governor Scott Walker includes cuts of \$900 million or nearly 10 percent from public education along with cutting \$250 million from state funding for the University of Wisconsin system. Michigan Republican Governor Rick Snyder’s budget includes a *de facto* cut to K-12 education of nearly \$700 per pupil as well as a \$225 million (15 percent) cut to funding for public universities. In California, Democratic Governor Jerry Brown is proposing to cut \$1.5 billion from funding for higher education. In New York, Democratic Governor Andrew Cuomo plans to cut \$1.2 billion from the state’s education budget.

Similar cuts to education are being proposed by administrations from both political parties across the country as part of their “shared sacrifice,” forcing the working class to pay for the economic crisis caused by the financial elite. This tactic is not limited to the United States; in Britain funding for higher education is to be slashed 80 percent by 2014-2015.

Faced with enormous cuts that threaten their livelihood and all social progress, workers in America and around the world have begun to fight back against the austerity measures of the ruling elite. The Socialist Equality Party calls on all scientists and workers to unite in this struggle to reject cuts to critical investments under the irrational capitalist system, and to fight for an increase in research and social spending and the rational, democratic investment of society’s wealth to ensure human progress in the 21st century.



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