

UK government slashes funding for astronomy and physics

Robert Stevens
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The Science and Technology Facilities Council (STFC) has announced significant cuts in the funding of science in the UK. The STFC funds science projects, including the allocation of university research grants.

Space missions and projects across astronomy, nuclear and particle physics will all face the brunt of a cut of £115 million. The inroads into physics and astronomy research are particularly wide-ranging.

Space projects are to be slashed by £42 million and astronomy projects by £39 million. A cut of £32 million is being made to particle physics projects, and nuclear physics projects will face a cut of £12 million. The STFC plans to implement a further £11 million in internal cost-cutting.

The STFC said the measures were necessary because of a £40 million deficit in its current budget. The cuts are to be imposed as part of the STFC's five-year £2.4 billion investment programme, which is based on a projection for the next Comprehensive Spending Review period. Further cuts are likely to be on the agenda, as the five-year plan does not take into account the Labour government's December 9 pre-budget announcement that education and science budgets are to be slashed by £600 million in 2011-2013.

In its announcement, the STFC listed 24 projects from which it will withdraw funding over the next five years. Michael Sterling, the STFC chairman, said of the cuts, "This has involved tough choices affecting the entire programme, including a managed withdrawal from some areas."

Among the high-profile projects affected are:

* The ALICE collaboration, which is devoted to building a dedicated heavy-ion detector to exploit the physics potential of nucleus-nucleus interactions at the Large Hadron Collider at Cern in Geneva.

* The Cassini Huygens mission studying Saturn and its moons—a joint mission between the European Space Agency and NASA.

Other space missions involved are the Solar and Heliospheric Observatory (which studies the Sun), the Venus Express (a satellite orbiting the planet), the Cluster mission (an unmanned space mission that studies the Earth's magnetosphere), and XMM-Newton (an orbiting X-ray observatory).

The UK will also end its participation in the European X-Ray

Laser Project, based in Hamburg, and the twin Gemini telescopes in Hawaii and Chile. Combined, the Gemini telescopes provide almost complete coverage of both the northern and southern skies. UK funding for the latter will end in 2012, according to the STFC.

According to one estimate, the cuts being made to nuclear physics equate to 52 percent.

A number of prestigious physics projects from which British scientists will be withdrawn include:

* AGATA—a European project to build a powerful spectrometer to study the structure of atomic nuclei.

* PANDA—a project linked to the Facility for Antiproton and Ion Research (FAIR), a particle accelerator in Germany. PANDA is to be the most advanced facility of its kind in the world and will look into key areas such as the confinement of quarks in hadrons. PANDA involves the collaboration of 400 scientists from 55 institutions in 17 countries. The UK was a founding member of PANDA.

Other projects from which British scientists are withdrawing include the European X-ray laser project (XFEL), the Photon Science Institute, and the New Light Source (NLS).

From next year, fellowships and studentships for PhD projects will be cut by 25 percent. Grants are also to be cut by 10 percent next year.

Professor Andy Fabian, the president of the Royal Astronomical Society, said, "With these cuts, UK-based researchers will struggle to retain their leading position in astronomy and space science."

Jocelyn Bell Burnell, president of the UK Institute of Physics, said, "The greatest shame about today's announcement is the reduced investment in people. With all of the challenges we face, from climate change and energy security to a rapidly aging population, we urgently need individuals well-trained in physics. Today's announcement...runs counter to this need."

Burnell contrasted the cuts being made in physics funding to the hundreds of billions of pounds of public money handed over to the banking system over the past year. "The amount needed to avoid this unfortunate cut is minor in comparison to the huge sums of money spent saving the financial sector. Surely, money can be found to avoid it," she said.

Paddy Regan, a physics professor at the University of Surrey,

also spoke in opposition to the cuts. “The community has basically been ‘done in’ by the STFC, which seems intent on killing off nuclear physics as an academic pursuit in the UK. These acts of scientific vandalism must be challenged and overturned.”

Another major project affected is the United Kingdom Infra-Red Telescope (UKIRT) on Mauna Kea in Hawaii, which is owned by the STFC and operated by the Hawaii Joint Astronomy Centre, along with the James Clerk Maxwell Telescope (JCMT). UKIRT is 30 years old and, with its 12.4-foot-diameter primary mirror, is the world’s largest infrared telescope. It has been at the forefront in its field for decades.

It is currently undertaking the UKIRT Infra-red Deep Sky Survey (UKIDSS) of the northern sky. Involving some 100 astronomers, it will be the most comprehensive survey ever undertaken. In particular, it will look for the coolest and nearest “brown dwarf” objects, high redshift dusty starburst galaxies, elliptical galaxies, galaxy clusters at various redshifts, and the highest redshift quasars. UKIDSS also “aims to discover the nearest object to the Sun (outside the solar system) as well as some of the farthest known objects in the Universe.”

The future of funding for the James Clerk Maxwell Telescope is also in doubt. The James Clerk Maxwell is a 49-foot radio reflector and is the world’s largest single-dish sub-millimeter telescope. The UK funds 55 percent of its operations, with Canada and the Netherlands funding the remainder.

The charge of “scientific vandalism” is entirely valid. Both the UKIRT and James Clerk Maxwell Telescopes are carrying out cutting-edge research on space and the universe.

In April of last year, the Joint Astronomy Centre reported on a joint study of the Great Nebula of Orion (one of the most famous objects in space). It was carried out by UKIRT, the IRAM Millimetre-wave Telescope in Spain, and the Spitzer Space Telescope in orbit above the Earth. The research team included more than a dozen astronomers from the US, the UK and a number of other European countries.

The press release stated, “They have found this stellar nursery to be a lively and somewhat overcrowded place, with young stars emitting gas jets in all directions, creating quite a chaotic picture. There is much more going on in Orion than previously thought.”

The Joint Astronomy Centre explained that the Orion nebula “is really just a blister on the surface” of the molecular cloud, and “gives an indication of what is really happening within.”

The report added, “To see through the cloud, we need to observe at wavelengths beyond the reach of the human eye. The longer (or ‘redder’) the wavelength, the better! Thus, the team have used UKIRT on Mauna Kea, the Spitzer Space Telescope, which works at even longer “mid-infrared” wavelengths, and the IRAM radio telescope, which operates beyond the infrared

at short radio wavelengths.”

Commenting on the importance of the discovery, Dr. Chris Davis said, “Using UKIRT’s wide field camera (WFCAM), we now know of more than 110 individual jets from this one region of the Milky Way. Each jet is travelling at tens or even hundreds of miles per second; the jets extend across many trillions of miles of interstellar space. Even so, we have been able to pinpoint the young stars that drive most of them.”

[See: http://outreach.jach.hawaii.edu/pressroom/2009_orion/index.html]

As with the cuts recently announcing in the funding of higher and further education, the reductions in science are rooted in the crisis of the existing economic and political system. The ruling elite is demanding the severest cuts in all forms of public spending that will have the most retrogressive impact now and in the future.

The full list of projects facing cuts is as follows:

* Astronomy

Auger, Inverse Square Law, ROSA, ALMA regional centre, JIVE, Liverpool Telescope, UKIRT. Additional reduction imposed on ongoing projects of £16m. Savings of £29m over 5 years.

* Particle Physics

Boulby, CDF, D0, eEDM, Low Mass, MINOS, Particle Calorimeter, Spider, UK Neutrino Factory. Additional reduction imposed on ongoing projects of £25m. Savings of £32m over 5 years.

* Nuclear Physics

AGATA, ALICE at CERN, PANDA. Additional reduction imposed on ongoing projects of £2m. Savings of £12m over 5 years.

* Space missions

Cassini, Cluster, SOHO, Venus Express, XMM. Additional reduction imposed on ongoing projects of £28m. Savings of £42m over 5 years.



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