Britain: Brown government slashes science budget

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On December 11, the Science and Technology Facilities Council (STFC) announced severe cuts to the budgets of critical physics research and astronomy projects in the UK.

The cuts are being imposed as the result of a £80 million shortfall in the tri-annual STFC budget. The council said this was mainly due to the higher-than-expected running costs at several large-scale projects.

While there has been an increase in the expected running costs of projects such as the Diamond Light Source project in Oxfordshire, the central factor determining the cuts is the slash in science funding announced in the Brown government's Comprehensive Spending Review. Under the October review, the STFC was granted a 13.6 percent rise in its budget to £651 million by 2011. When inflation and the running costs of new facilities are taken into account, this equates to a 7 percent cut in the budget of the STFC and leaves it unable to maintain research at its current level.

This will have a devastating and long-term impact on UK involvement in groundbreaking projects such as the International Linear Collider (ILC) and the Gemini observatories in both hemispheres, which have contributed greatly from the knowledge and resources of British scientists and researchers. All UK research in ground-based solar-terrestrial physics and high-energy gamma-ray astronomy will also be halted.

The STFC is a government funding body formed in April of this year, following the merger of the Council for the Central Laboratory of the Research Councils and the Particle Physics and Astronomy Research Council. Its remit is to fund science projects in the UK, including allocating research grants to university departments, financing research infrastructure, and numerous training and knowledge programmes. The STFC's budget for physics and astronomy includes funding for research into particle physics, nuclear physics, space science and both ground-based and space-based astronomy.

The cuts follow a November announcement by the STFC that in order to save £4 million it is to pull UK funding and scientists out of the Gemini observatory. The UK is withdrawing its support for this project after investing some £35 million.

Gemini consists of two large telescopes, one in Chile and the other in Hawaii. These are critical to international astronomers because they provide total and unobstructed coverage of both the northern and southern skies. They are among the most advanced optical/infrared telescopes available and can be operated remotely due to their networking capabilities.

As well as the cuts to a raft of projects announced by the STFC, warnings have been sounded by many in the scientific community of large-scale cuts in research grants allocated to universities. Hundreds of highly qualified scientists could lose their jobs as a result.

According to information circulating on astronomy and physics research blogs, the STFC has informally asked universities if they would be able to cope with a cut in existing research grants of between 25 and 40 percent.

In response to the STFC announcement, Professor Michael Rowan-Robinson, president of the Royal Astronomical Society, said, "I have it from a very reliable source that we are looking at a 25 percent cut in grants over the next three years. Programme cuts could even result in some existing research grants being cancelled. Both of these are truly awful for universities."

In its spending plans the STFC stated it will be "necessary to withdraw from or cut back on other planned programmes and facilities."

The report continues, "As part of the programmatic review we will consider the case and our financial capacity for further investment in the operation of the UK infrared telescope (UKIRT) in Hawaii, Merlin, the Liverpool Telescope, Astro-Grid and whether and at what level we should invest in the US-led Dark Energy Survey.

Among the programmes and research being threatened/halted are:

* The UK withdrawal from the planned International Linear Collider (ILC) has been announced in the report. The ILC is a 40-kilometre-long tunnel for electron-positron collision. This next-generation particle accelerator is essential to the future development of physics and will collide electrons and their anti-particles, positrons. Its primary objective will be to investigate what the universe is made from, reveal the origin of mass, what dark matter is and how it came to be. It promises to revolutionise our understanding of the universe.

* Funding for the United Kingdom Infra-Red Telescope (UKIRT) on Mauna Kea in Hawaii is to be reviewed.

* Further investment for MERLIN, the network of radio telescopes operated by Jodrell Bank Observatory at the University of Manchester is to be reviewed.

* Further investment for the Liverpool Telescope on La Palma in the Canary Islands is to be reviewed. This is the world's largest research robotic telescope and, due to its (RINGO) optical polarimetre instrument, was recently awarded the "Research Project of the Year" by the *Times Higher Education Supplement*. The team operating RINGO produced a research paper this year, "Measuring Gamma-Ray Bursts." Commending the research, Professor Philip Esler, chief executive of the Arts and Humanities Research Council, said they had made a "brilliantly innovative discovery into the fundamental nature of the Universe that could have profound impacts in the decades ahead."

* The document states it is considering "whether and at what level we should invest in the US-led Dark Energy Survey". This project seeks to establish what dark energy is and the possible reasons why the universe is accelerating. Scientists and researchers at five universities in the UK have been involved in this international project: the University College London, the University of Cambridge, the University of Edinburgh, the University of Portsmouth and the University of Sussex.

* Funding for the £14 million AstroGrid project is being reviewed. AstroGrid was set up to form the UK contribution to a global virtual observatory. One of its key goals is to establish a working datagrid for key UK databases and a set of tools for online database analysis and exploration for use by the astronomy community. The AstroGrid is set to

play a very important role due to the sheer massive amounts of raw data being collected by many international astronomy and physics projects.

The AstroGrid website explains the factors driving the necessity for such a project. “Firstly, there is an explosion in the size of astronomical data sets delivered by new large facilities like the ESO VLT, the VLT Survey Telescope (VST), and VISTA. The processing and storage capabilities necessary for astronomers to analyse and explore these data sets will greatly exceed the capabilities of the types of desktop systems astronomers currently have available to them. Secondly, there is a great scientific gold mine going unexplored and underexploited because large data sets in astronomy are unconnected. If large surveys and catalogues could be joined into a uniform and interoperating ‘digital universe,’ entire new areas of astronomical research would become feasible.”

The STFC report states that, “we will finalise plans for the rundown of our investment in the Isaac Newton Group of telescopes in the Canary Islands”.

* Funding for all ground-based solar-terrestrial physics facilities will cease.

* Funding for high-energy gamma ray astronomy experiments will cease.

* In the field of particle physics, the STFC spending plan states, “We will revisit the on-going level of our investment in a number of projects, including the experiments for the direct detection of gravitational waves i.e. GEO600 and Advanced LIGO; experiments in the direct detection of dark matter, i.e., Zeplin III using the Boulby mine; and the cosmic microwave background experiment, CLOVER”.

The STFC said it intended to reveal the extent of the cuts it plans to make in the targeted areas following further internal meetings. However, it has not taken long for the axe to begin to fall.

Some of the most severe cuts will be at the Royal Observatory in Edinburgh in Scotland. On December 20, the UK Astronomy Technology Centre (ATC), based at the observatory on Blackford Hill, announced that its budget will be halved over the next three years, with cuts totaling up to £3.7 million a year. Due to its position and renown as one of the main designers, producers and suppliers of the sophisticated instruments for many of the world’s major ground- and space-based telescopes, the cuts at the ATC will do particular damage to international astronomy research.

The ATC currently employs about 100 staff and says that the cuts will mean the redundancies of about 50 percent of its staff. Professor Ian Robson, director of the ATC said, “We are very disappointed with the result of the spending review. We are looking at a reduction of 50 percent in the workforce on site here unless we can generate external income. In terms of the UK as a hotbed of science and technology and a leader in Europe, this is all quite tragic.”

The Royal Observatory in Edinburgh has a distinguished history in the annals of astronomy. Its origins go back to the opening of the town’s college in 1583, where astronomy was taught from the outset. In 1786, the Chair of Astronomy was established at the university. The Astronomical Institution of Edinburgh was formed in 1811 and was the first society in Britain devoted solely to the burgeoning science of astronomy. The Royal Observatory was founded in 1822 as a result of the dedicated work of the Astronomical Institution of Edinburgh.

The Royal Observatory has since become synonymous with enriching global scientific understanding and progress in the field. The first Astronomer Royal for Scotland, Regius Professor Thomas Henderson, was appointed at Edinburgh in 1834. He became, chronologically, the first astronomer to measure parallax and in doing so determined the distance to a fixed star (Alpha Centauri). He carried out this groundbreaking work at the observatory at the Cape of Good Hope in South Africa. Before his death in 1844, he made more than 60,000 observations of star positions.

Throughout the last century, the observatory played a critical role in international astronomy and physics research. In the 1970s and 1980s, the observatory designed, built and operated the UK Schmidt Telescope in Australia, the UK Infrared Telescope in Hawaii and the James Clerk Maxwell Telescope, also in Hawaii.

There has been immediate and widespread opposition to the cuts from university departments and leading professors, astronomers and physicists in the UK and internationally. Many international scientists have expressed incredulity and astonishment that a government would so willingly jeopardise and terminate years and even decades of scientific research at the stroke of a pen.

An online petition calling on Prime Minister Gordon Brown to reverse the planned cuts was signed by more than 3,500 people on its first day.

Universities UK, the representative body for UK universities, said that it envisaged a “significant loss of staff at all levels” and “UK institutions would therefore lose leadership in world-leading projects and lose international collaborative partners.” It added, “Institutional investment in staff and equipment would not be fully exploited and facilities would become run-down.”

It also pointed out that as a result of cutting back research grants, “there will also be a considerable impact in parts of Chemistry, Biology, and Engineering.”

John Dainton, professor of physics at Liverpool University, called on scientists in other disciplines to protest against the STFC’s cuts.

Watch David North’s remarks commemorating 25 years of the *World Socialist Web Site* and donate today.

Ken Peach, professor of physics at the University of Oxford, said the STFC three-year plan was a “truly appalling document which gives little idea of the depth of the financial crisis caused by the underfunding of STFC. There is already, today, damage to physics at home, where young researchers are afraid for their careers, and to our reputation abroad, where this abrupt change of attitude has been noticed by our international partners.”

Peach denounced the decision to withdraw from the International Linear Collider particle accelerator, stating it made no strategic or scientific sense.

Brian Foster of the John Adams Institute for Accelerator Scienceat the University of Oxford said of the STFC plan, “It attempts to play down the damage that will be caused to particle physics and astronomy as well as the other disciplines that the STFC is supposed to serve. Physics departments across the country will be severely impacted by these proposals. This is a sad day for physics in the UK. It is scientific vandalism to throw all this away in order to make a small dent in a much larger STFC financial shortfall substantially brought about by the merger of two earlier research councils and totally unrelated to particle physics research or the merits of this project.”

Today, it is impossible to conceive of an astronomy or physics project that is not the product of years of work of scientists and researchers in at least several or many countries. Many human years of study and research need to be invested in such projects. This necessary collaboration of vast global human resources and knowledge are no more evident than with the International Linear Collider project, scheduled to be completed in 2010.

The website for the project states, “Planning, designing, funding and building the proposed International Linear Collider will require global participation and global organisation.”

The work is being led by an international team of more than 60 scientists and engineers who have established a Global Design Effort for the ILC. This team in turn formulates the design and priorities for the work of many scientists and engineers around the world.

Some 2,000 people from more than 100 universities and laboratories are collaborating in more than dozen countries to design and build the ILC. The UK has already invested £30 million in the ILC. The project has been supported since 1991 by the UK’s Linear Collider Collaboration and involves more than 100 scientists at 16 centres in Britain.

The ILC has now reached a critical stage, with physicists working on the detailed design of the accelerator. The estimated cost of building the ILC, excluding research and development, prototyping, land acquisition, underground easement costs, detectors, contingencies, and inflation, has been calculated at $US6.65 billion.

Professor Brian Foster at Oxford is also the European Director of the ILC. He said of the STFC plan, “For the UK to withdraw from the ILC at this crucial stage would be like refusing to refuel the lead racing car at the last pit stop before the finish line due to concerns about the cost of petrol.”

Professor Phil Burrows from the University of Oxford stated that the withdrawal “would alienate the international community which entrusted vital parts of the project to UK scientists, severely damaging our credibility in all future international scientific projects.”

Two German scientists involved in the ILC also criticised the decision. Professor Rolf-Dieter Heuer, research director at the DESY research institute in Hamburg, said, “Designing a machine to answer nature’s most fundamental questions takes time and effort, and losing leading scientists from the UK would be a major setback.”

Professor Albrecht Wagner, chair of the International Committee for Future Accelerator, stated, “This represents an extraordinary waste of the investment and leadership established by the UK in this truly international project.”

The UK government’s elimination of programmes and research that have taken decades to establish is a major setback to international scientific research, particularly into fundamental questions of physics and cosmology. This is social vandalism and sabotage on a massive scale.

The amount of money required to fund these science projects is less than £100 million—a minuscule amount relative to overall government expenditure. The fact that it will not fund even this sum required for its existing science budget is a clear indication of its broader intent to slash public spending to the bone in the interests of its corporate backers.

While announcing the cuts in the science budget, the STFC “Delivery plan” was also revealing in that it summed up the role that government sees for science in the UK. Scientific facilities are increasingly being subordinated to the requirements of big business. Under the section, “Improving UK Business Competitiveness,” the document states, “STFC has played an active role in ensuring that UK companies are able to tender for work at major research centres.” To this end, the STFC is promoting, a “coherent national programme to ensure that UK companies get the widest knowledge of the opportunities open to them and early intelligence about new developments.”

The STFC states, “Commercial use of the STFC facilities and technology programmes has grown,” and as an example cites “75 collaborative projects with industry with a value of £11.9m.”

This pro-business ethos is being spearheaded by the STFC. In the section entitled, “Commercialisation,” it reports that it has “worked closely with universities and international centres to encourage an entrepreneurial approach which has yielded success.”

The budget cuts and loss of accumulated experience and expertise due to the callous disbanding of teams of scientists, engineers and technicians is symptomatic of a government whose priorities are completely opposed to the development of scientific understanding and progress.