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# Science Budget Allocations

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Joint response from the Institute of  
Physics and the Royal Astronomical  
Society to a House of Commons  
Innovation, Universities and Skills  
Committee Inquiry

A full list of the Institute's and the Society's  
responses and submissions to consultations  
can be found at [www.iop.org](http://www.iop.org) and  
[www.ras.org.uk](http://www.ras.org.uk)

11 January 2008

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Clerk to the Committee  
Innovation, Universities and Skills Committee  
House of Commons  
7 Millbank  
London SW1P 3JA

**IOP** Institute of Physics



Dear Sir/Madam

### **Science Budget Allocations**

The Institute of Physics is a scientific membership organisation devoted to increasing the understanding and application of physics. It has an extensive worldwide membership and is a leading communicator of physics with all audiences from specialists through government to the general public. Its publishing company, IOP Publishing, is a world leader in scientific publishing and the electronic dissemination of physics.

The Royal Astronomical Society (RAS) is the UK's leading professional body for astronomy & astrophysics, geophysics, solar and solar-terrestrial physics, and planetary sciences. Its members include the majority of scientific researchers in UK universities, observatories and laboratories. The RAS organises scientific meetings, publishes research journals, promotes public engagement in science and represents UK astronomy, nationally and internationally.

The Institute and the Society welcome the opportunity to submit evidence to inform the House of Commons Innovation, Universities and Skills Committee's Inquiry into the Science Budget Allocations.

The attached annex highlights the key issues of concern relating to the Science and Technology Facilities Council's Science Budget allocation and its Delivery Plan for the 2008/09 to 2010/11 Comprehensive Spending Review period.

If you need any further information, please do not hesitate to contact us.

Yours faithfully

**Professor Peter Main**  
Director, Education and Science  
The Institute of Physics

**Professor Michael Rowan-Robinson**  
President  
The Royal Astronomical Society



## Science Budget Allocations

### SUMMARY

#### Impact on physics and astronomy

- STFC will have to cut £80m from its planned programme of activity over the CSR period, which will have devastating consequences for many of its science areas. STFC's Delivery Plan announced a 25% cut to grants, which will lead to a loss of millions of pounds in research income (of up to £750k) for many physics departments which will threaten their financial viability.
- The cut will result in research project cancellations and a significant cut to rolling grants, which will affect the projects of all STFC user communities (e.g. astronomy, particle physics, nuclear physics, etc.), and lead to redundancies at STFC operated facilities at the Daresbury Laboratory, the Rutherford Appleton Laboratory, and the Astronomy Technology Centre.
- Uncertainties raised about the long-term prospects for physics may lead to a reduction in the attractiveness of physics undergraduate, MSc and PhD programmes and of physics as a long-term career path. A reduction in the number of students choosing physics would have implications not only for the financial viability of physics departments, but also for the long-term competitiveness of the UK's economy.
- Reneging on existing commitments without prior consultation will damage the UK's reputation as a leading player in international collaborations.

#### Principal issues

- The Institute and the Society urge DIUS to allow STFC to postpone the implementation of its Delivery Plan until after the health of disciplines review of physics (the Wakeham review) has reported in mid-summer 2008. There needs to be a commitment that the Wakeham review will address the current STFC problem, and that it makes use of informed international opinion.
- STFC should be given time to produce a revised Delivery Plan in which its scientific priorities are developed in full consultation, and that the balance of capital investment and associated operations and exploitation costs are optimised. Important long-term decisions should not be made on such a short timescale as was the case with its current Delivery Plan.
- The 25% cut in grants will pose severe financial constraints to many physics departments. The Institute and the Society urge DIUS to provide the £80m shortfall in STFC's budget, or at least £20m to allow STFC's planned programme to continue until after the Wakeham review has reported.

- Increases in the running costs of major facilities should be allocated to the research councils who make the most use of facilities. In the case of the Diamond Light Source and ISIS, users are largely outside of the STFC funded community. It is not fair that core funding of physics grants should be affected by increased activity in, for example, the study of medical materials.
- The Institute and the Society are concerned that the arrangements for compensating for changes in international subscriptions have reverted to STFC. DIUS should revert to the practice of providing protection against changes in exchange rates and net national income from a departmental reserve.

## **BACKGROUND**

The Comprehensive Spending Review (CSR) announced in 2007 led to an increase to the total science budget of 17.4%<sup>1</sup> over a three year period. The Engineering and Physical Sciences Research Council (EPSRC) and the Science and Technology Facilities Council (STFC), the two major funders of physics research, were allocated 18.6% and 13.6% increases respectively. It is understood that the vast majority of these increases will be needed to cover the full economic costs (FEC) of research, whereby 80% overheads are paid on grants. Even though FEC is a positive development, with more money entering university science, its phased introduction does make it difficult to unravel the financial consequences of the CSR settlement. Essentially, its effect is not to fund more science but to ensure that the science that is supported is better funded.

For EPSRC, significant funds which would have been allocated to it were instead directed to the new Technology Strategy Board (TSB) and the Energy Technologies Institute (ETI); around 3% of its annual budget. Its actual budget will rise by an average of 6.2% a year from £711m in 2007-08 to £843m by 2010-11. But over time, with inflation and the need to pay 80% FEC the number of grants awarded via its responsive mode mechanism will be reduced. This is a situation that the Institute intends to monitor as a reduced number of funded grants will mean less research income for physics departments. Increased competition for a smaller pot of money will have an impact on the morale of academics and lead to financial pressures on departments.

According to STFC, due to the need to pay 80% FEC, redundancy costs associated with the forthcoming closure of the Synchrotron Radiation Source (SRS) at the Daresbury Laboratory, etc., the 13.6% increase to its budget basically amounts to a flat cash settlement, i.e. a reduction in real terms, even though the increase is above inflation. STFC's annual budget is proposed to increase from £573.5m in 2007-08 to £651.6m in 2010-11, an average increase of just 4.5% per annum.

Crucially, and unlike most of the other research councils, STFC has many fixed costs associated with running national facilities and paying the UK's increasing subscriptions to international facilities (of the order of £180m per annum). STFC also has to cope with increased operational costs for a number of new facilities, especially the Diamond Light Source and the ISIS Second Target Station, which according to the Public Accounts Committee report, *Big Science*, investment in large scientific

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<sup>1</sup> The Allocations of the Science Budget 2008/09 to 2010/11; December 2007; DIUS; [www.dius.gov.uk/publications/URN07114.pdf](http://www.dius.gov.uk/publications/URN07114.pdf)

facilities<sup>2</sup>, totals about £27m per annum. It appears that the lion's share of the problem for this shortfall is a consequence of the structure of the system which provides capital funding to construct new facilities but not operational costs. Moreover, these increased costs were ring-fenced within STFC's allocation, which is a legacy that it inherited from CCLRC. This arrangement directly contradicts the reassurance that PPARC users were given by the government that STFC would not be burdened with the liabilities of CCLRC, following the merger on 1 April 2007.

*Principal issue: Increases in the running costs of major facilities should be allocated to the research councils who make the most use of facilities. In the case of the Diamond Light Source and ISIS, users are largely outside of the STFC funded community. It is not fair that core funding of physics grants should be affected by increased activity in, for example, the study of medical materials.*

In addition, STFC will also have a greater responsibility for dealing with the effects of fluctuations in international subscriptions (e.g. CERN) caused by changes in the value of the pound. In the event of a sustained decrease in the value of the pound against the Swiss Franc and/or the euro, such changes could lead to a decrease in the volume of research possible to make use of the international facilities provided by the subscription. This is a new development thrust upon PPARC and now STFC by the government. Such a vulnerability to currency fluctuations appears unique among major European nations. Making provision for possible fluctuations is another constraint on STFC's budget (and the budget of other research councils with international subscriptions).

As a consequence of these factors, STFC will have to cut £80m from its planned programme over the CSR period. This will have devastating consequences for many of STFC's science areas, with the biggest impact due in year one of the CSR period.

Prior to the announcement of its Delivery Plan, STFC made the decision to withdraw from the Gemini Observatory, which will save it about £4m a year in running costs (this figure may not include withdrawal penalties). Other measures announced in the Delivery Plan include the withdrawal from major facility programmes (e.g. the ILC), the reprioritisation of investment in high priority science programmes, and a cut of at least 25% in grants for all areas. The cut translates into various project cancellations and a significant cut to rolling grants, which will affect the projects of all STFC user communities (e.g. astronomy, particle physics, nuclear physics, etc.), and result in redundancies at STFC operated facilities at the Daresbury Laboratory, the Rutherford Appleton Laboratory (RAL), and the Astronomy Technology Centre (ATC). Indeed, STFC is planning to remove funding from its current programme in the region of £120m rather than just £80m, in order to create headroom in its budget to revive some cancelled projects and for investment in new projects.

The reductions represent a hammer blow to the morale and future prospects of the physics and astronomy communities funded by STFC, especially when considering the encouraging statements made by an independent panel of international physicists and astronomers, who benchmarked the quality of the UK's research efforts in physics and astronomy against its leading international competitor nations<sup>3</sup>. The panel noted the considerable efforts that had been made to improve the status of physics and astronomy in the UK, since the preceding review in 2000, and was struck by the general improvement in the research environment and the positive

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<sup>2</sup> [www.publications.parliament.uk/pa/cm200607/cmselect/cmpublic/521/52102.htm](http://www.publications.parliament.uk/pa/cm200607/cmselect/cmpublic/521/52102.htm)

<sup>3</sup> International Perceptions of UK Research in Physics and Astronomy 2005; January 2006; EPSRC, PPARC, IOP & RAS; [www.iop.org/activity/policy/Projects/International\\_Review/index.html](http://www.iop.org/activity/policy/Projects/International_Review/index.html)

outlook of those involved with the research effort at all levels. The panel also reported that the UK continues to enjoy a high international standing in the areas of astrophysics and solar system physics, particle physics, and nuclear physics; this world-leading position is now under considerable threat.

Following the announcement about the Gemini Observatory and concerns about further proposed cutbacks, the Institute and the Society consulted with their membership and made representations to the government, along with several other bodies, in order to discuss various options that could be used to support STFC and limit the damage that would fall upon the physics and astronomy community, and prevent redundancies at STFC operated facilities. It is understood that there was some flexibility offered in response, first, a loan in the region of £27m for year one of the CSR period (which has to be paid back in years two and three) to aid STFC in reprofiling its structure (i.e. redundancy packages), and second, £5m per annum has been released from STFC's capital funds which can be utilised immediately for recurrent costs. However, these limited measures are not going to prevent damage being done to the physics and astronomy research base, especially as they will not significantly alter the margin of cuts announced to grants.

While it is, of course, the government's right to prioritise whichever area of science it chooses, it is not sensible to implement such damaging cuts to physics and astronomy apparently by accident and before there is any opportunity for debate or planning. Indeed, the scale of the changes could cause irreversible damage to the UK's long-term ability to lead in a number of key areas of physics and astronomy research, which will have an impact on the UK's ambition to be leading knowledge-based economy.

## **IMPLICATIONS OF STFC'S DELIVERY PLAN**

It is understood that STFC's Delivery Plan<sup>4</sup> was formulated very quickly, and it did not have time to consult its user community effectively. STFC has publicly admitted that there are many issues within it that still need to be agreed and finalised. In addition, the creation of STFC occurred just a few months before the submissions for the Comprehensive Spending Review of 2007, which did not allow much time to prepare a robust case.

*Principal issue: STFC should be given time to produce a revised Delivery Plan in which its scientific priorities are developed in full consultation, and that the balance of capital investment and associated operations and exploitation costs are optimised. Important long-term decisions should not be made on such a short timescale as was the case with its current Delivery Plan.*

The following are the headline statements from STFC's Delivery Plan in response to which we have outlined the likely impacts on physics and astronomy as gleaned from our communications with physics departments and government-funded laboratories.

### **25% cut in research grants:**

At the town meeting organised by STFC on 13 December 2007<sup>5</sup>, it was outlined by Professor Keith Mason, STFC's chief executive, that STFC's grant awarding capacity

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<sup>4</sup> [www.stfc.ac.uk/About/Strat/Council/STFC\\_DelPlan.aspx](http://www.stfc.ac.uk/About/Strat/Council/STFC_DelPlan.aspx)

<sup>5</sup> [www.stfc.ac.uk/About/Strat/Council/TownMeeting07.aspx](http://www.stfc.ac.uk/About/Strat/Council/TownMeeting07.aspx)

in all areas will have to be cut by around 25%, including grants that are currently being reviewed for funding. Current STFC grant funding in university physics departments across the UK is in the region of £80m, so this could lead to a £20m sector wide reduction over this period, which we calculate to be a loss of around £9m in overheads under FEC.

*Principal issue: The 25% cut in grants will pose severe financial constraints to many physics departments. The Institute and the Society urge DIUS to provide the £80m shortfall in STFC's budget, or at least £20m to allow STFC's planned programme to continue until after the health of disciplines review of physics (the Wakeham review) has reported.*

The impact of this cut will be differential across physics departments and will be felt over a period of time, but all departments will suffer. STFC funding typically accounts for anything between 25 and 80% of departmental grant income in a range of subject areas such as physics, astronomy and applied mathematics. (One department, in particular, is entirely dependent on STFC for grant income; this also applies to many individual research groups within departments.) A cut of 25% could equate to a loss of millions of pounds in grant income including overheads, a result that would raise concerns over a department's financial viability within many university funding models. In addition to project and facilities funding, STFC grants also directly support academic staff, postdoctoral research assistants (PDRAs), technical and administrative staff, and PhD students.

For example, one particular research-intensive physics department, on average, secures over £17m per annum in research income (based on spend), of which 40% is secured from STFC. This includes staff costs, non-staff spend (equipment, travel, consumables, etc.) and overheads but not the associated spend at facilities. A 25% cut would then equate to a loss of around one-tenth of its total grant income (£1.7m). The loss in overheads resulting from a 25% cut (i.e. around £750k) would have a severe effect on the department's finances, a situation that is in sharp contrast to the HEFCE funding introduced to protect the future of high cost scientific subjects deemed vulnerable but key to the economy<sup>6</sup>. It would be particularly difficult to re-adjust to this situation on the timescales that seem to have been proposed as there are additional costs in making staff redundant which would not be borne by STFC. At the level of a 25% cut, a reduction in research support staff of between 20 or 30 could be anticipated for a number of departments. There would also be significant detriment to the work of staff outside the former PPARC community, for example, condensed matter physicists who use central computing facilities and plasma physicists who use the Central Laser Facility (CLF) at Harwell. For one department, income based on the use of such facilities in the RAE period was over £3m.

For another department whose STFC turnover is about £1.9m, a 25% cut would represent a £475k reduction in funding, of which the overheads are around £200k. The potential impact of the cuts in grants would be severe threatening the viability of STFC funded research programmes in the university. This scenario applies to several small- to medium-sized departments and will have damaging consequences. By their nature, these departments are in challenging financial positions, where their universities are investing heavily to maintain and develop world-class research effort.

Perhaps even more damaging is that STFC has stated that it will cancel some existing grants. This will damage the relationship of trust between universities and the research councils and make forward planning very difficult. It will leave

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<sup>6</sup> [www.hefce.ac.uk/News/HEFCE/2006/science.htm](http://www.hefce.ac.uk/News/HEFCE/2006/science.htm)

departments having to make people redundant at very short notice when they have been awarded contracts with explicit long-term end dates. It will cause great damage to a wide variety of science programmes and a department's ability to recruit high-calibre staff.

In summary, the loss of grant income to a department will inevitably lead to:

- an increased risk of closure, exacerbated by the accompanying reduction in direct funding and overheads;
- an abrupt loss of posts funded on grants that are cut;
- a loss of leadership prospects for high profile international projects, coupled with a reduced international reputation and a loss of collaboration partners;
- a reduced ability to attract other grants (e.g. EU, industry, etc.) as a result of reduced leadership roles, reputation and matching funding;
- to a reduction in the attractiveness of physics undergraduate, MSc and PhD programmes and of physics as a long-term career path;
- a reduction in institutional support for staff and equipment, which could lead to lack of exploitation of the investment made to date and to facilities becoming run-down; and
- a reduced ability to attract and keep hold of high-calibre academic staff within an increasingly global job market.

### **Particle physics :**

*- STFC Delivery Plan: We will cease investment in the International Linear Collider.*

The withdrawal from the International Linear Collider (ILC) will have a major impact on the UK's international credibility in future collaborations. It is damaging that a long-term, high-profile international programme which PPARC/STFC has actively encouraged over several years has been terminated without consultation.

A number of particle physics research groups have been working on the development of the ILC project, which is currently in its design phase, and have international leadership roles. Indeed, the international review panel reported that the UK's experimental particle physicists are taking a leading role in all aspects related to the ILC which is to become the next major project in particle physics.

In addition, the statement in the Delivery Plan that the increase in the CERN subscription will come out of the particle physics grants line is at variance with the treatment of other international subscriptions (e.g. ESA), which are top-sliced. This additional siphoning from an already shrinking particle physics domestic programme will greatly reduce the UK's ability to exploit the CERN subscription at a critical time when the first data are due from the Large Hadron Collider (LHC).

These decisions will have serious consequences for UK particle physics in the post LHC era, as the ability to attract good scientists to fellowships, or PhD students, etc. will be adversely affected.

## **Nuclear physics:**

*- STFC Delivery Plan: We will focus our investment in nuclear physics on the highest priority programmes.*

The nuclear physics community is already under pressure as a result of the transfer of responsibility from EPSRC to STFC and has been subject to planning problems for over a year. Nuclear physicists are very concerned by the vagueness of this statement, which is almost meaningless, as it hides the possibility of some serious pruning. A major concern is the possibility of a cut in grant funding. Because of the changeover, all funding for nuclear physics is through grant applications which are currently under consideration. Hence a cut of this nature would be a cut on the total nuclear physics programme and not just that part which comes up for renewal at this time.

In addition, at a time when the government has just announced its commitment to new nuclear build, it seems incomprehensible that a cut should be made on research groups which will provide a training ground for new, young staff with the skills required for the safe operation of a new generation of reactors.

Moreover, there are also serious longer-term implications, beyond short-term financial loss, if STFC is unable to collaborate in international nuclear physics ventures such as the Facility for Antiproton and Ion Research (FAIR) based in Germany, membership to which was recommended by the international review panel along the lines of the CERN subscription<sup>3</sup>.

The UK has no nuclear accelerator facility but physicists have adopted a realistic plan for optimising their capability to undertake forefront research on international facilities (e.g. GANIL, SPIRAL, etc.), by embedding themselves in an integral way by building a number of key instruments. Thus they play an enhanced role in the research, highly leveraging the relatively small funding. The facilities in Europe would not be able to carry out research of the same quality without UK contributions.

## **Particle astrophysics:**

*- STFC Delivery Plan: 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. We will cease to invest in high-energy gamma ray astronomy experiments.*

Not only is the immediate threat to CLOVER a concern, but the decision to cease investment in high-energy gamma ray astronomy experiments will lead to a loss of momentum and expansion for the research area, as UK research groups will cease to contribute to the interpretation of data. Moreover, a lack of involvement in the development of the next phase of instrumentation will have long-term consequences. World-leading experimental groups will be damaged by withdrawal from ground-based gravitational wave experiments and from underground searches for dark matter.

## **Astronomy:**

*- STFC Delivery Plan: We plan to withdraw from future investment in the twin 8-metre Gemini telescopes and we will work with our international partners to retain access to Gemini North.*

The decision to withdraw from the Gemini Observatory will have a major impact on astronomy and astrophysics research groups. The withdrawal, particularly at short notice, will significantly reduce access to the research tools needed to undertake their research, and will substantially reduce the UK's capacity to lead world-class research in these areas over the next few years. This decision could also threaten the future of the ATC, based at the Royal Observatory Edinburgh, which plays a key role in delivering world-class instrumentation.

However, we note that the Delivery Plan states that STFC are negotiating for continued access to Gemini North and welcome this. Access to optical and infrared telescopes in the northern hemisphere (e.g. Gemini North, UKIRT, WHT) is crucial for exploitation of SCUBA-2 surveys.

*- STFC Delivery Plan: We will cease all support for ground-based solar-terrestrial physics facilities.*

STFC has all but done this already as it has closed or is closing the CUTLASS and SABRE radars, the ionosondes and the SAMNET magnetometer chain as a national facility. This decision will cause considerable problems with current facility grants and missed opportunities in future international collaborations for many research groups.

*- STFC Delivery Plan: We will target our investment in astronomy grants taking account of reduced facility availability.*

This decision will reduce the grants of a number of astronomy research groups, particularly those in observational astrophysics, which will have impact in terms of reductions in staff (e.g. PDRAs), FEC and other infrastructure in renewed grants. The withdrawal of already awarded grants connected to cancelled facilities will be particularly traumatic for those involved.

*- STFC Delivery Plan: 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.*

Any reductions in these areas will damage the UK's involvement in near infrared astronomy, where ground-breaking surveys are being carried out by UK astronomers with UKIRT, and in radio astronomy, where Merlin represents the main current UK facility, which would impact on many departments. Withdrawal from the Liverpool Telescope or the Dark Energy Survey would fall heavily on the departments involved.

*- STFC Delivery Plan: Subject to programmatic review, we will reduce our post-launch support for existing (space) missions by around 30%.*

This may affect research groups that have post-launch support grants for current missions like Integral and Newton-XMM.

### **Neutron scattering:**

*- STFC Delivery Plan: ISIS is the world's most productive pulsed neutron spallation source. In the short-term, given financial constraints, we may have to consider reducing availability to UK users in universities.*

Many physics departments are heavy users of ISIS, and any reduction in access would severely undermine their research efforts. This particularly applies to condensed matter physicists, who do not get grants from STFC, but rely on the facilities it provides. The experiments on highly topical problems are least able to accommodate delays. Thus it would be more difficult for UK users in universities to publish in the highest impact journals, and this is one of the key criteria upon which the success of facilities, and UK science itself, is judged.

If the operation of ISIS is not properly funded, it will have an impact on the research of not just physicists, but will also affect considerable parts of biology, chemistry, and engineering.

### **International subscriptions:**

*- STFC Delivery Plan: From 31 March 2008 onwards, any significant increases in international subscriptions resulting from adverse movements in exchange rates and/or NNI rates will be dealt with in the same way as uninsured risks i.e. STFC will be expected to absorb the increase up to £6m...*

The loss of protection from currency fluctuations and changes in net national income (NNI) is a significant issue, especially as it is something which the research councils fought for many years to secure. This protection is even more important for STFC, given that its remit requires that a large proportion of its allocation has to be invested in overseas facilities. This decision could have some serious long-term issues and many are concerned that the UK's future participation in the LHC could be threatened.

*Principal issue: The Institute and the Society are concerned that the arrangements for compensating for changes in international subscriptions have reverted to STFC. DIUS should revert to the practice of providing protection against changes in exchange rates and net national income from a departmental reserve.*

### **The Harwell and Daresbury Science and Innovation Campuses :**

*- STFC Delivery Plan: The Harwell and Daresbury Science and Innovation Campuses form the most innovative and ambitious aspect of our KE strategy and will be recognised as internationally leading centres of excellence for science and innovation.*

Significant STFC resources will be absorbed by the creation of the new Harwell and Daresbury Science and Innovation Campuses, which will aim to improve the UK's performance in knowledge transfer amongst other things. The Institute is of the view that the prime beneficiaries of the campuses will be regional economies rather than STFC funded programmes. Hence, the regional development agencies should make a contribution to STFC.

## **LONG-TERM IMPACT ON PHYSICS AND ASTRONOMY**

The proposed reduction in research grants will have a major impact on the viability of individual physics departments, which, for instance, will reduce their ability to attract and retain internationally leading research staff. The Institute's Survey of Academic Appointments in Physics 1999-2004<sup>7</sup>, showed that at the time over 1760 staff were engaged in physics research and teaching in the UK, of which the two most populated areas were Astronomy, Astrophysics, Cosmology and Space Physics (19%), and High Energy and Particle Physics (11%). These two areas were also the most popular for arriving staff. In addition, the cuts will also disproportionately reduce the number of women engaged in physics research, especially in the areas of astronomy and particle physics.

It is well known that astronomy and particle physics are the main areas of physics that attract students to study physics. At a time when the decline in the number of students sitting A-level physics has been arrested, and the numbers applying and being accepted to study university physics have been increasing, these cuts could undermine the efforts of all the stakeholders that have led to this turning of the tide. We have already heard from schoolteachers that some students who were considering studying university physics are now reluctant to do so because of the STFC funding crisis.

The government, for example, in its *Next Steps* publication<sup>8</sup>, has continually stressed the importance of the UK being a world-leading, knowledge-based economy due to it excelling in curiosity-driven research and innovation and competing with the threat posed by the burgeoning economies of China and India. This is dependent on the UK continuing to produce high-quality physics graduates, academics being provided with the funds and facilities to undertake internationally-leading research, and the ability to transfer the knowledge generated to technologies and services that can increase the UK's economic productivity and the well-being and prosperity of its population.

Indeed, along with a number of other subjects, physics has been identified as a subject of strategic and national importance, and HEFCE has allocated the Institute £1.8m to increase numbers studying A-level and undergraduate physics, through its Stimulating Physics programme<sup>9</sup>. Furthermore, HEFCE has allocated £75m over three years to ensure that the funding shortfall in its teaching funding formula will not lead to any further departmental closures in high cost and vulnerable science subjects<sup>6</sup> (the most recent being the University of Reading physics department in 2007). It is of concern that while one branch of the government is making strenuous efforts to increase the number of physicists another is taking actions that will have the opposite effect. Moreover, the cessation of the allocation of additional funding from HEFCE (2009-10), will coincide with the time the impact of the RAE 2008 allocations will be fully realised; an occurrence which is usually a cause of uncertainty for physics departments, which will be exacerbated by the STFC funding crisis.

There is a special situation in Scotland where cuts will have a particularly damaging effect on the on the Scottish Universities Physics Alliance (SUPA). SUPA is an alliance, which aims to place Scotland at the forefront of research in physics. In a short space of time, SUPA has built up a reputation of excellence in world-class

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<sup>7</sup> [www.iop.org/activity/policy/Publications/file\\_4148.pdf](http://www.iop.org/activity/policy/Publications/file_4148.pdf)

<sup>8</sup> Science and innovation investment framework 2004-2014: next steps; March 2006; HM Treasury; [www.hm-treasury.gov.uk/budget/budget\\_06/assoc\\_docs/bud\\_bud06\\_adscience.cfm](http://www.hm-treasury.gov.uk/budget/budget_06/assoc_docs/bud_bud06_adscience.cfm)

<sup>9</sup> [www.stimulatingphysics.org/](http://www.stimulatingphysics.org/)

physics research and raised the prominence of physics in Scotland. A significant component of the next phase of SUPA was a bid was to collaborate with STFC to start development work on the ILC. If this funding collapses, SUPA could also lose out on an investment from the Scottish Funding Council (SFC) and future funding opportunities.

### **HEALTH OF DISCIPLINES REVIEW – PHYSICS**

The Secretary of State for DIUS has asked Professor Ian Diamond of Research Councils UK (RCUK) to organise a health of disciplines review of physics, which will be chaired by Professor Bill Wakeham, vice-chancellor of the University of Southampton. We understand that the review is scheduled to begin in mid-January and is expected to report in mid-summer 2008.

The Institute and the Society welcome the review which we hope will address the current STFC problem as well as the longer-term future of physics. The terms of reference of the review are not yet public but a crucial element will be the balance between capital spending and running costs, which is certainly at the heart of STFC's problems. Furthermore, it is imperative that the Institute and the Society are fully engaged in the review, in order to provide a broad professional oversight.

Both EPSRC and the former PPARC were joint sponsors, along with the Institute and the Society, of two International Reviews of UK Physics and Astronomy Research in 2000 and 2005. These reviews arose from the interest of the former Office of Science of Technology (OST) in receiving an international assessment of the standing of British physics and astronomy research and the research councils' wish to obtain a better understanding of the strategic position of both subjects. Both reviews recruited an independent panel of international leading physicists and astronomers, who reported on the quality, distribution of effort and future potential of research in physics and astronomy, providing detailed comments on the health on each of the major sub-areas of research. The panels also made recommendations on how the funding of such research could be optimised. It would seem sensible for the Wakeham review to take full cognisance of these reports and, perhaps, to use some of the panel members as consultants.

*Principal issue: The Institute and the Society urge DIUS to allow STFC to postpone the implementation of its Delivery Plan until after the Wakeham review has reported. There needs to be a commitment that the Wakeham review will address the current STFC problem, and that it makes use of informed international opinion.*

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