analysis

Stars in their eyes

Spin doctors of science are using past investment in physics and astronomy as a shield to conceal real cuts in funding that threaten to undermine the promising careers and significant achievements of the past decade, says Andrew King.

After weeks of dire news about grant cuts, many UK astronomers were pleasantly surprised to read, on 7 February, that the Science and Technology Facilities Council will hold spending on research posts "broadly level" in 2008. Certainly 10 Downing Street was, as it highlighted the news in the government's response to the online petition about the STFC's funding crisis.

The surprise 'News from Council' statement, which followed a strategy meeting of the STFC Council on 28 and 29 January, confirmed that the STFC's three-year Delivery Plan, released just before Christmas, "will hold exploitation research grants to Universities in 2008 at broadly the same level as 2007".

The statement revealed that, for astronomy, the total number of postdoctoral research assistants (PDRAs) in place this year would be 323, compared with 278 in 2006 and 329 in 2007. With a decrease of only six posts in the new round, from 329 to 323, "broadly level" seemed an unambiguous description.

However, a closer look at the STFC statement suggests that astronomers should not celebrate just yet, and that ministers might use caution when repeating the claim in parliament. Annex A of the statement reveals that the 2008 round will award just 82 PDRAs.

As grants are awarded on a three-year cycle, we have to look forward two more years to see the net effect of this level of funding. If the council again awards 82 PDRA posts in 2009 and in 2010, the total in post by then will be 246, down 25 per cent from the current 329.

In other words, this year's "broadly level" grants settlement is simply the first stage of the 25 per cent cut planned all along by the STFC.

The reason for the superficial paradox is, of course, the sharp rise in astronomy PDRA grant awards in 2006 and 2007. This rise reflected growing confidence that investment in fundamental research was attracting talented people to study physics at all levels, and was bringing many of the world's best to the UK. The long decline of the UK's talent pool in physics, relative to the rising trend in economies such as India and China, was at last being halted and reversed.

But now the brakes have been slammed on with a vengeance, and the smell of hot metal is palpable. This year's 82 new posts evidently replace 88 PDRAs who finished grants announced in 2005. So, research groups last funded in the 2005 round had their total allocation cut by six PDRAs, or by about 7 per cent. But many more PDRAs will drop off grants in 2009, and even more in 2010. The effect of a flat award of 82 in those two years will be far more severe relative to previous allocations.

Next year's putative 82 PDRA awards will be about 25 per cent fewer than the number awarded when groups last applied for funding; in 2010, the reduction will be an eye-watering 37 per cent.

from the archives keith mason

Transparency is the promise of a man who tried for absolute zero

In late 2005, long before running the STFC, Keith Mason was the new head of the Particle Physics and Astronomy Research Council. He was keen to clear the opacity of the funding system, and to promote the UK's voice abroad, as he told **Linda Nordling**.

Keith Mason has had a busy couple of months. As the new chief executive of the Particle Physics and Astronomy Research Council [which, with the Council for the Central Laboratory of the Research Councils, formed the new Science and Technology Facilities Council in April last year], he is a key player in the drafting of the science programme for Aurora, the European Space Agency's planetary exploration venture.

"I've been over to the US talking to the NASA people, had various bilaterals with ESA folk," he says. In December, ESA ministers will sit down and discuss the science programme, and consider whether to put their money to it. "We're converging on a realistic programme that will do excellent science and yet be affordable."

Having served on the PPARC council for five years, he is no stranger to science policymaking.

"It's no surprise for me how things work. The main feeling I have right now is that, finally, I can do something about things that frustrated me for so long." One of these things, he says, was the opacity of the funding system.

"We run a jolly good peer review system but I think we can build more transparency into it." The peer review system tended to squeeze out long-term blue skies projects in favour of urgent short-term funding needs, he says. But the blue skies science can often become important in the long term. "Getting that discipline into the programme, to not squeeze out the seed corn that will give us the crops in 10-15 years'

To soften these blows, the STFC would have to increase its PDRA awards significantly in 2009, and again in 2010. The fact that the projected overall PDRA cut works out so ominously close to the much-touted figure of 25 per cent suggests that this is not what the STFC has in mind. Indeed, the only other options on grants cuts, which it considered during the savings review, were even larger.

So, the pain for research groups in the next two funding rounds is delayed, but will be much greater unless something changes.

Of course, one could argue that these groups will receive bigger cuts only because they had bigger rises in the past. Certainly, groups in this year's round can feel aggrieved that they did not share in the boom years of 2006 and 2007. However, for groups in the next two rounds, the lurch from glut to famine will be hard to bear. They will have to abandon research lines just as they believed them successful. The huge fluctuations in grant income, amplified by the multiplier effect of full economic costing, will cause real problems for physics departments and universities, which have used recent grant levels as their baselines for future planning.

The situation for promising young researchers will be even worse. Production of graduate students has also increased sharply over recent years, and not peaked yet. These new PhDs will find themselves competing for only 82 PDRA posts in each of the next three years. Moreover, many of the accumulated 82 PDRAs who dropped off grants in earlier years will be competing with them for the same positions. And all this turmoil is against a background of withdrawals from astronomy facilities so sudden that many students will struggle to complete their theses.

The recent partial and temporary reprieve of the UK's expulsion from the Gemini Observatory, revealed by the Gemini Board last week, is unlikely to help students graduating after 2010 unless it is made permanent. In this event, it could ironically unleash even deeper cuts in PDRAs unless some other area of astronomy takes Gemini's place in the tumbrels rumbling towards the guillotine.

The negative messages about physics that are going back to schools and the damage to the UK's reputation as both a leader in physics and astronomy and a reliable international partner are scarcely what the government can have hoped for from an increased science budget.

'Now the brakes have been slammed on with a vengeance, and the smell of hot metal is palpable.'
Andrew King

Far from being a magnet for talent from all over the developed world in recent years, the UK will rapidly turn into a major net exporter, as bright young scientists look abroad for jobs, and take their dearly bought expertise with them.

One kind of expertise that seems set to be retained is the skill in repackaging grant announcements. The saw-tooth profile of recent PDRA numbers makes it tempting to switch at will between totals and new announcements when making comparisons with the past. Astronomers should brace themselves for descriptions of next year's allocation of new PDRAs as "broadly level" if the number is 82, or even "increased" if it is 83.

As we have seen, such figures actually mean unprecedented cuts in the total number of post-docs, something unlikely to get much of a fanfare. More of this kind of broad levelling may leave UK astronomy, still in many ways a world leader, broadly flattened.

Something to add? Email comment@ResearchResearch.com

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time, is absolutely crucial."

Mason should know. Over a decade ago, he tried to get funding for a programme on sensors that work close to absolute zero. "I can remember trying to get money to start a programme on that 10-15 years ago, and it was very difficult."

Now, it turns out, these sensors are the future. They are currently used in ground-based astronomy and will soon be used in space-based astronomy as well. "Eventually, we'll also use them outside the astronomy programme for medical research and things like that."

PPARC is, like other research councils, keen to foster such technology transfer. Mason talks about a "science food chain" where all the links needed, from basic science to technology development, are in place.

"One of the problems in the UK is that, previously, bits of the chain have been there but not the whole thing." The missing link tended to be between basic and applied research. "The frustrating thing is that it's not under my control as chief executive of PPARC. I can do my bit of it, but it requires other people along the chain to also function in the right way. It needs—a horrible phrase—'joined-up thinking'."

The research councils are working with the government to nurture such joined-up thinking on technology transfer. PPARC has set up a pilot scheme that would see grants going straight to industry. Before, companies have had to apply in collaboration with universities to qualify for funding.

"The full scheme should come into force in a year or so," says Mason. PPARC still has to ensure it won't violate EU competition law. "We can't be perceived to be giving state aid. But we do want to make this connection."

The role of PPARC has changed over the past few years, Mason says. "It has gone from an organisation that simply distributes government money to...being an advocate of UK science." As such, a large part of his job is making the UK's voice heard in international discussions and making sure its expertise is recognised in large, collaborative programmes.

"Quite often people feel guilty about going into basic science, thinking 'maybe I should go into something more useful'. But that's a short termist view," says Mason.

"If you look at the development of our society and how we've used scientific advances, if you take the 50 year view, I can't think of anything more important than developing new ideas that will help us survive on this planet for hopefully a long time to come."

Keith Mason, STFC's chief executive, declined to reply to criticisms of his leadership. This is a slightly abridged version of an interview from ResearchResearch's online archive [RF 12/10/05, p7]. *Linda Nordling is now editor of* Research Africa, *based in Cape Town.*