The Roberts Review: proposals for change

The government’s review of UK scientists and engineers is to be welcomed, but how much of this concern will translate into effective action, asks Dave Clements.

In April 2001, the government commissioned a report into the provision of skilled scientists and engineers in the UK. This examines the whole supply chain for technically trained people, from school through university to PhDs, lectureships and into the broader job market. This report was published in April 2002 (The Roberts Review: SET for Success: The supply of people with science, technology, engineering and mathematics skills). Its conclusions are likely to form the basis of government policy in this area for some time to come, and will thus have a direct effect on the policies of higher education and research funding councils.

Specific recommendations that may affect astronomy and geophysics research include:

- PhD stipends should be raised to match the equivalent take-home salary of a graduate working in industry (currently just over £12 000 per year).
- PhD funding should be extended to three-and-a-half years from the current standard of three years.
- PhD numbers should remain at the current levels, and that quality and not quantity of PhD students was most important.
- PhD funding should be related to training which meets rigorous minimum standards. This training should include at least two weeks of dedicated training per year, principally in transferable skills. Additional funding should be supplied for this training, over which the student should have some control. The training should not necessarily be at the student’s host institution.
- PhD maintenance awards should be extended to EU PhD students.
- There should be a new programme to pay undergraduates and postgraduates to support the teaching of science in schools.
- Universities should ensure that all postdocs have a clear career development plan and have access to at least two weeks a year of training in appropriate skills. HEFCE and research council funding should be made conditional on the implementation of this recommendation.
- Postdoc and academic salaries, especially starting salaries, should be significantly increased.
- A significant number of new academic fellowships (200 per year) should be established. The award of these should be based on academic and not just research excellence (i.e. including teaching and outreach activities), and that recipients should move from a purely research role and into teaching and outreach over the course of the fellowship.
- An early and clear distinction should be made between postdocs on different career paths (described as industrial, academic and research).

These recommendations will go some way to making training and careers in scientific and technical fields more attractive to the most able students, and will ensure that the majority of PhDs and postdocs, who have to leave academia and their chosen subject areas, will be better equipped with transferable skills.

The full report can be found at the Treasury website: www.hm-treasury.gov.uk/Documents/Enterprise_and_Productivity/Research_and_Enterprise/ent_res_roberts.cfm.

ESA’s Cosmic Vision

Peter Bond reports on optimistic plans for Europe’s future space programme, outlined in May this year.

An artist’s impression of ESA’s next mission to the Sun, Solar Orbiter (ESA).

- Rosetta, to explore comet Wirtanen (2003),
- SMART-1, which will demonstrate ion propulsion technology on its way to the Moon (2003),
- BepiColombo, a mission to Mercury (2011–12),
- Solar Orbiter, a mission to take a closer look at the Sun (2011–12).

Fundamental physics missions will include:

- STEP, a mission to test the equivalence principle (2005) – although this relies on NASA, the major partner, deciding to proceed,
- SMART-2, a technology demonstration mission (2006) that will pave the way for LISA, a joint mission with NASA to search for gravitational waves (2011).

In addition, the Agency is committed to co-operation with NASA in the Next Generation Space Telescope (NGST), currently expected to launch in 2010.

The missions are grouped so that they may be built using common technologies and engineering teams where possible. Other requirements of the new plan include:

- Implementation of BepiColombo and Solar Orbiter with international partners. Both missions will be implemented as a single activity, leading to significant savings.
- Implementation of Herschel/Planck and Eddington in a single project, reusing the same bus. This implies a launch of Eddington not later than 2008.
- Technical changes reducing the cost of GAIA with no science loss.

- Significant gains through new technology in cost effectiveness of spacecraft development and procurement.
- Timely availability of payloads, one of the current pressing problems.
- Acceptance of increased managerial complexity and overall programmatic risk.

Although the programme maintains the breadth and strength of ESA science, there are some potential risks. “Obviously, the implementation of such an ambitious programme requires full commitment of all involved parties, namely industry, the Executive, the national funding agencies and the scientific community from the start,” said an ESA representative. “Increased programmatic risk means that the programme will be less resilient to an event like the Cluster mission loss in 1996 where a recovery was instituted in four years.”

Further international collaboration on missions and payloads is likely to be encouraged. Specifically, a significant contribution from NASA on Solar Orbiter as part of the International Living with a Star (ILWS) programme may be linked to European participation in other elements of the American LWSSTP programme. The overall funding assumption underlying the new plan is that purchasing power will – at the minimum – be preserved in the years following 2005.