



*Advancing
Astronomy and
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The Education and Skills Committee Inquiry into The Future Sustainability of the Higher Education Sector: Purpose, Funding and Structures

Executive summary

- The Royal Astronomical Society (RAS) wishes to make a full contribution to the inquiry into the Future Sustainability of the Higher Education Sector which will incorporate recent RAS research into the education of UK geophysicists & astronomers.
- *Re* the Bologna process, the RAS is concerned that our education structure already may place UK doctoral graduates at a disadvantage compared with their counterparts in other EU nations by making them less attractive to higher education and research establishments across the continent

Introduction

1. The RAS is the UK's leading professional body for astronomy and astrophysics, geophysics, solar and solar-terrestrial physics, and planetary sciences. It has more than 3000 members, including scientific researchers in universities, observatories and laboratories.
2. Much of its membership has a direct interest in the future of higher education in the UK and in the on-going process of harmonisation with other European states that followed the signing of the Bologna declaration in 1999.
3. The RAS would have welcomed the opportunity to make more substantial contributions to both of the Select Committee's inquiries. However, given the imminent deadline, this communication is necessarily truncated. We hope, though, that the Committee will want to receive our more detailed evidence as and when it becomes available.

Note: While it is appreciated that the remit of the Select Committee is restricted to England, what follows has general applicability to the UK

Future Sustainability of the Higher Education Sector: Funding and Structures

4. The RAS welcomes the decision of the Education and Skills Committee to undertake a far reaching inquiry into the role of universities, what the principles of their funding should be, and how they fit into the overall structure of the HE sector. While what follows focuses on the contribution of universities to the UK economy, as repositories of accumulated and generators of new knowledge, universities enrich society in many, and possibly more fundamental, ways.

5. Some 50 universities in the UK teach astronomy at an undergraduate level, usually as part of a department of physics and astronomy, and 40 of them have significant astronomy research groups. This reflects the popularity of this subject which, over the past two decades, has resulted in roughly one new astronomy department or teaching group being added every year (although this has now reached a plateau). There is evidence that the health of those physics departments which are managing to survive, and since 1992 over 30% of university physics departments have been closed or merged, increasingly is dependent on the attractiveness of the astronomical component of first degree courses as well as the world class research being conducted by UK based astronomers.

6. Only 7 university departments, down from a dozen, offer geophysics undergraduate degree programmes. The number of students reading for first degrees in geophysics is now about half of that 20 years ago, while 80% of master's programmes have been discontinued. This, paradoxically, has happened at a time when, besides the continuing manpower requirements of the hydro-carbon industry, we need to know more about hazards like earthquakes, volcanoes and tsunamis; the monitoring and implementation of nuclear arms control or nuclear waste disposal and CO₂ release and sequestration. However here, as in other branches of physics, except astronomy, students have 'voted with their feet'.

7. The decline in physics and geophysics teaching capacity, notwithstanding the continuing appeal of astronomy, raises important implications for the way in which the higher education system should be funded, if we are to maintain internationally-competitive research universities which equip graduates with the skills required by UK employers. The government has accepted the conclusions of the Robert's 2002 report ('SET for Success') that, unless there is a reversal in the significant falls in the numbers of students opting for physics, mathematics, chemistry and engineering, its attempts to improve the UK's productivity and competitiveness could be undermined. The closing of physics departments, in particular, by cash - strapped Vice-Chancellors, regardless of arguments related to strategic need, raises important issues about the way public funding should be channelled. To rely on current student choices to determine the long-term supply of qualified scientists and engineers needed by the UK economy could be a costly strategy. Despite recent and welcome initiatives from HEFCE to promote interest in, and the viability of, strategically important subjects, including the physical sciences, the fact remains that universities, as semi-autonomous bodies, cannot escape immediate and pressing financial imperatives. Only the government can afford to take a long term view and ensure the survival of departments or subjects until such times as other measures have reversed the decline in secondary school students opting for science 'A' levels and related university degree courses thereafter. In this connection, astronomy and geophysics, anecdotally, is said to play a critical role in stimulating interest in schools science. The RAS is commissioning research to document the evidence which, we anticipate, will demonstrate this.

The Bologna Process

8. Until now the UK has been slow to respond to the restructuring of European higher education. For example, the introduction across most of Europe of a standardised undergraduate Bachelor/Master structure with a duration of five years may disadvantage graduates in the UK system, where many Masters level degrees are completed after four years of study.

9. In 2005 the RAS, together with the Institute of Physics (IoP), the Particle Physics and Astronomy Research Council and the Engineering and Physical Sciences Research Council, commissioned a review on 'International Perceptions of UK Research in Physics and Astronomy'. The panel of leading, foreign, experts noted that the short duration of UK PhD training could be undermining the ability of UK PhD graduates in physics and astronomy to compete scientifically with their peers from other countries. The Panel recommended that the UK instigate an in-depth review of graduate level education, including comparisons with its leading scientific competitors. This is in train. Following a scoping study, due to complete in February 2007, to determine and test the methodology needed to conduct such a wide investigation, the IoP and RAS will engage with other bodies to seek support to undertake a full study in 2008. We anticipate that its results will be of considerable interest to the Committee and to the Government.

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