

## **House of Lords Science and Technology Sub-Committee: Inquiry into Higher Education in STEM Subjects**

### **Response from the Royal Astronomical Society**

1. With more than 3500 members (Fellows) the Royal Astronomical Society (RAS) is the leading UK body representing the interests of astronomers, space scientists, planetary scientists and geophysicists.
2. The RAS is therefore pleased to submit written evidence to this inquiry. This submission, approved by our governing Council, covers three of the key questions posed by the Committee.

#### What effect will higher education reforms have on the quality of teaching, the quality of degrees and the supply of STEM courses in higher education institutions?

3. The majority of universities plan to charge home students £9000 per annum for first degrees, a sum insufficient to cover the cost of laboratory- and fieldwork-based courses such as physics, astronomy and geophysics. The reforms to funding under discussion by the Higher Education Funding Council for England (HEFCE) are therefore expected to include a premium paid to subsidise the teaching of science courses, as proposed in the 2010 Browne Review of Higher Education Funding which led to the new tuition fees regime.
4. At present however the size of this additional subsidy remains uncertain. If the extra funding does not cover the additional teaching costs of more practical STEM subjects (the mooted value of £1500 per student per annum would be too low to do this), some universities may elect to support more arts and humanities courses at the expense of science provision. Those STEM courses that remain will effectively be subsidised by fees for arts courses, thus creating an unhealthy and unwelcome tension between different areas of academia.
5. Alongside this, the HEFCE reforms due to come into effect over the next two years include the removal of at least some of the additional funding that Strategically Important and Vulnerable Subjects (SIVS) attract at present. It is not clear what if anything will replace this investment.
6. The Society therefore asks peers to investigate whether HEFCE and / or BIS will continue the policy of offering additional support to lab- and fieldwork-based STEM disciplines, at a level which allows them to be offered on an equal basis with other subjects. We also strongly recommend that the lighter restrictions on recruitment for these subjects are retained, in recognition of their wider importance. If these measures are in place, they will go some way to preventing the closure of more physics

departments, a key concern of the RAS, Institute of Physics (IOP) and many other bodies with an interest in STEM in higher education.

7. In 2006 the British Geophysical Association report on “Geophysics Education in the UK” highlighted both the severe shortage of and the strong demand for geophysics graduates by industry, with universities reporting that these graduates have a very high rate of recruitment to degree-related employment. After representation from the RAS this subject received some extra funding in 2007. HEFCE however reports that despite its recognised value geophysics is not covered by the current SIVS list and we thus call for it to be eligible for additional support and for lighter restrictions on recruitment (in line with other physical sciences) in the new policy regime. If this is not forthcoming we are concerned that many geophysics courses will be forced to close.

Should state funding be used to promote Masters degrees and is the balance right between the number of Masters degree students and PhD students?

8. We would like to draw peers’ attention to the 2011 decision by the Natural Environment Research Council (NERC) to withdraw funding for taught MSc courses, despite the importance of these postgraduates to industry. There seems little prospect of private companies offering financial support on the same scale and we suggest that NERC should review and if necessary reconsider this action once its full impact becomes clear.

What impact will higher education reforms have on the willingness of graduates to pursue a research career?

9. Since the reforms to higher education funding came into effect, the Government has worked hard to persuade prospective undergraduate degree students that the new system of tuition fees and student loans is affordable over the span of a typical graduate career. Although the repayments in any given year are typically modest, the Society is nonetheless concerned that a high debt (perhaps more than £60000 after graduation once loans for living costs are included) may deter many graduates from pursuing study at PhD level. Such a change will damage the status of research in areas like astronomy and space science, where the UK is ranked second in the world after the United States.
10. A number of Fellows of the Society point to the earlier example of the impact of the introduction of tuition fees at a maximum level of £3000 in 2004. Applications to undergraduate courses in astrophysics declined from that year until 2008 and many students were reluctant to consider postgraduate study as a result of the associated increase in their overall personal debt.