
Request for Inquiry topics recommendations

Institute of Physics response to a House
of Lords Science and Technology
Committee request for topics of inquiry

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consultations and inquiries can be viewed at
www.iop.org

18 January 2013

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Chris Atkinson
Clerk
Science and Technology Select Committee
House of Lords
London SW1A 0PW

IOP Institute of Physics

Dear Chris,

Request for inquiry topic recommendations

The Institute of Physics is a leading scientific society. We are a charitable organisation with a worldwide membership of more than 45,000, working together to advance physics education, research and application. We engage with policymakers and the general public to develop awareness and understanding of the value of physics and, through IOP Publishing, we are world leaders in professional scientific communications.

The Institute welcomes the opportunity to respond to the House of Lords Science and Technology Committee's request for recommendations for future inquiry topics that it could consider undertaking. A number of timely and important topics have been listed in the attached annex.

If you need any further information on the points raised, please do not hesitate to contact me.

Yours sincerely,



Professor Peter Main
Director, Education and Science

Request for inquiry topic recommendations

Industrial funding for interns

1. We understand that industrial employers are becoming increasingly reluctant to hire interns in the current economic climate, particularly SMEs and spinouts that may be feeling the pinch more than some large multinationals.
2. This is of particular concern to universities that allow their students to undertake work placements in industry. Such students go on to perform better, gain invaluable real-life work experience in an area closely aligned to their training, and gain a wider appreciation of the kind of technical and soft skills they need in order to succeed in a competitive job market following graduation. In addition, those graduates that pursue an academic career will have made links with industry which they will build upon and could aid in the future exchange of knowledge which will benefit the commercialisation of academic research.
3. The Committee could look at what kind of specialised support the government could provide such as offering tax concessions to incentivise employers to become engaged and providing assistance to administer schemes. For SMEs, a different approach is required as hiring interns can be a significant burden in terms of time and resources. In addition, the Committee could look more broadly at promoting SME internships in the context of a STEM skills shortage and investigate how graduate internships are being treated relative to apprenticeships, for which there is a big cross-government drive to increase numbers.

Postgraduate education

4. There is growing concern about the impact that reduced funding and support for postgraduate education, especially taught Masters Programmes, will have for the UK's science and innovation base in terms of producing highly trained people that will have the skills and knowledge requisite for academic research and to meet the demanding needs of industry. We essentially have a system in place that is transferring the costs of postgraduate education to UK students which will have implications for the participation levels of UK-domiciled students.
5. With regards to Masters Programmes, there is a need for the government to support and expand the provision for taught courses for postgraduate training, especially in areas that are of national importance, which is something the Committee could examine. There are only a small number of stand-alone Masters degrees being offered by physics departments, for example, primarily due to the fact that the four-year integrated Masters qualification (e.g. MPhys, MSci) is increasing in popularity, but also as it is difficult to get sufficient funding to cover the costs.
6. In addition, the UK cannot ignore what is happening in mainland Europe, where the costs of postgraduate education are a fraction of what UK institutions charge and where the Bologna Declaration reforms have been adopted meaning that a 3+2+3 cycle is now the norm. The UK has ignored a move to such a cycle which has implications for the international mobility of its graduates.

Open access data requirements

7. A related issue to open access publishing, into which the Committee is currently undertaking an inquiry, is that of open access data requirements which is being driven by the Cabinet Office in the name of transparency. This is not a popular policy, particularly amongst universities who are concerned with the time and resources that they would have to spend trying to do something that may not be even be possible to achieve in the form that the Cabinet Office is seeking.

8. The issues are complex and multiple with regards to accessing data, which includes such matters as firewalls and data being meaningless unless they are accompanied by metadata to help understand them. Incorporating and capturing metadata is problematic unless there is access to the logbooks used by researchers and it is hoped that the plans do not include scanning logbooks, etc. The only data that should be made available are supporting data linked to published papers. This is a far more reasonable request than what is being proposed. However, even though RCUK would not want to be over prescriptive and provide maximum freedom to the universities, they may be forced to take a common (and more prescriptive) approach to this issue as pressures for greater openness and greater harmonisation intensify.

9. The Committee could look to undertake an inquiry into how universities, amongst others, would cope with the requirements for making all data available in a readily accessible form.

Rare resources management

10. Critical shortages of key elements and materials are emerging such as indium, gallium and the rare earth metals (e.g. gadolinium), which could be ameliorated by better recycling or by appropriate storage until prices rise. Improved management of resources is a key mechanism for both enhancing the economy and mitigating/adapting to increasing global demand.

11. An inquiry that explores what shortages in such resources will mean for the UK's science and innovation base, proposes a timescale for each resource and a roadmap of technologies that will reduce usage or improve handling, coupled with recommendations for legislative/regulatory action, would be of great benefit.

Noise pollution

12. Environmental noise pollution in modern life is becoming an increasing problem. The Committee could initiate an inquiry into how science and technology can act as a driver to reduce noise pollution.

13. Such an inquiry could focus on advancements in:

- more efficient traffic management systems;
- reducing noise emissions by source modification;
- reducing the noise generated by fans in devices such as computer hard drives;
- developing new engine technologies, low-noise road surfaces, and reducing noise from tyres;
- measures to obstruct the path of noise;
- acoustics R&D to increase noise insulation in modern housing; and
- acoustic barriers at airports and railway stations.

Space exploitation and exploration

14. The exploitation and exploration of space remains one of the most stimulating and exciting areas of scientific research. Increasingly, space exploration has come to the fore as governments and space agencies plan even more ambitious missions to survey the depths of our galaxy, search for signs of life, and to ascertain whether the natural resources we take for granted on Earth, such as water and raw fuels, could be found and subsequently mined from other planetary bodies, as our supplies dwindle. For instance, it has been suggested that the moon could be mined for helium-3 which is scarce on Earth, as a potential fuel source. Future nuclear fusion reactors using helium-3 could provide a highly efficient form of nuclear power with virtually no waste and no radiation.

15. The Committee could investigate the grand challenges that lie ahead for, in particular, human space exploration, especially the safety aspects, and whether the search for natural resources on the moon and other planets in our solar system is a realistic ambition, and whether the UK is in a position to play a leading part in such endeavors.

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