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Institute of **Physics** in Scotland
Chair
Prof D H Saxon DSc DPhil MA
CPhys FInstP FRSE
Dean of Faculty of Physical Sciences
University of Glasgow

Merger of the Funding Councils Team
Enterprise Transport and Lifelong Learning Department
2nd floor, Europa Building,
450 Argyle St.,
Glasgow G2 8LG

Please reply to
Prof D H Saxon FRSE,
Dean, Faculty of Physical Sciences,
Kelvin Bldg, University of Glasgow,
Glasgow, G12 8QQ,
Scotland

Tel: +44 (0) 141 4673
Fax: +44 (0) 141 4371
Dean@physics.gla.ac.uk

Institute of **Physics** in Scotland

Dear Sirs,

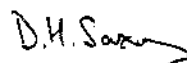
Consultation on the Merger of SFEFC and SHEFC.

1. The Institute of Physics in Scotland is the national body for promoting physics and supporting physicists and students of physics in Scotland, having over 2400 members in many sectors of Scottish life. Particular areas of focus are the promotion of physics in schools, (as exemplified by the Physics Teacher Network co-sponsored by the Institute and the Scottish Executive), the needs of industry for trained manpower based on physics and related engineering skills, the promotion of excellence in Scottish universities, (for example by accrediting degree programmes and via the QAA subject benchmarks we helped to establish), and an outreach programme to the public, (via our sponsorship of activities in science centres and universities.) The comments below refer specifically to the teaching of physics at university level.
2. Physics is a school subject, and is seen as more difficult than most. At university level we would not serve either our students or our country's needs for trained manpower by diluting the conceptual challenge and the adventure of discovery. A consequence is that in specialist physics teaching at university level there is some rigour, and an emphasis on sequential development, rather than modular appreciation of diverse topics. This has to be blended with the progressive development of personal skills, both specialism-based and generic. We also provide, from within physics departments, courses aimed at biologists and others, where the emphasis is on the relevance of physics concepts and applications to their particular fields, rather than on the underlying principles.
3. The QAA benchmark for Honours Physics lays emphasis on the abilities of a physicist, rather than on a tightly defined body of factual knowledge. This is done for a number of reasons. The areas of strength of physics across the country are both coherent and diverse, as are the needs of employers. We must provide rigorous grounding in the basics, but at the same time rejoice in the diversity of development at the higher level, and in the range and relevance of the experience available to students by performing their final year projects in international-quality research groups. A continuing spur to

innovation and quality in teaching is that teaching at all levels is done by international research leaders.

4. We therefore subscribe enthusiastically to your theme of '*relevance*' (para 5.) The Scottish degree structure surpasses the English one in its ability to *respond* to the needs of individual students and in its *flexibility* to add breadth whether within our own subject area, or by linking to another subject. Popular combinations are Physics with Mathematics, with Chemistry, or with Electrical Engineering. High quality is evidenced by *Quality Assessments*, and most recently by Scottish ELIR procedures and by our own Institute Degree Accreditation mechanism. To provide *opportunities for all*, the Institute of Physics has committed itself to introduce and finance a bursary scheme from 2006, based on financial needs, for students on accredited courses both in Scotland and elsewhere.
5. Scottish universities and physics departments have shown themselves to be go-getting and inventive in the pursuit of excellence and of opportunities. One can cite winning the UK Astronomy Technology Centre for Scotland and gaining the national e-Science centre, (stemming from the ScotGRID RDG initiative,) by physics departments in Edinburgh and Glasgow. A new *model of institutional cooperation* (para. 72) has been proposed to SHEFC (the 'Scottish Universities' Physics Alliance'). This will serve to enhance quality and innovation in physics teaching at undergraduate and postgraduate level apart from its prime objective of fostering research excellence. Scottish universities are also in the forefront of developing ways of making physics in schools more attractive, for example by the 'Scholar' initiative at Heriot-Watt. The strength of Scotland in lasers and opto-electronics are well known, and physics departments are active in Proof of Concept and Enterprise Fellowship activities. Scotland can be confident in the spirit of initiative and pursuit of quality that is embedded in its physics departments, without a need to impose central direction.
6. All of this does not come cheap. The quality of the education available to undergraduates and its development from first-year basics to cutting-edge Honours and M Sci/M Phys projects is basically underpinned by the research excellence and vitality of the universities. Innovation is specifically encouraged by the open way that course requirements are given in the QAA subject benchmark, and is enabled by the vigour and resource of the departments. Our teaching aimed at specialists in other fields such as biology or electrical engineering (see para 2 above), which still includes practical work, is best done by separate provision, which of course also needs some additional resources.
7. In view of the above, we therefore ask the Executive to require the new Funding Council, in reviewing its funding algorithms, to take into account the need of the field for strong and confident physics departments which are adequately resourced, in order to provide the responsiveness, flexibility, quality and coherence which you seek and which the Scottish physics departments can continue to deliver and to develop.

Yours faithfully,



D H Saxon
Chair, Institute of Physics in Scotland