



Annual Report 2013/2014

Physics at the heart of Scottish science



Welcome from the Chair of IOP Scotland

Having taken over as Chair of IOP Scotland in October 2013, it is my pleasure to welcome you to the 2013/14 report prepared by our National Officer, Alison McLure. The highlight of the year for IOPS, without a shadow of a doubt, was on 8 October 2013 when Peter Higgs was awarded the Nobel Prize in Physics, jointly with François Englert. What a day for Scottish physics! This award acknowledges Peter's great achievement and the talents, dedication and perseverance of many Scottish physicists working in particle physics at CERN. It has had significant influence in capturing the imagination and raising the profile of physics with many young people. In 2014, we reached the milestone of 10,000 pupils choosing to take physics at Higher level.

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I am extremely pleased that we have extended our public lecture series across the country and now have a programme in Glasgow, Aberdeen and Dundee alongside the well established Edinburgh programme at the RSE. Also, we have set up an Early Career Researcher Group spanning industry and academia providing a forum for young researchers to meet and discuss ideas for future collaboration and employment opportunities. Our Seniors Group goes from strength to strength. Thanks to all who make this possible.

There has been, and will continue to be, significant change to the structure of both the building and staffing at IOP Central in Portland Place. A new building has been bought and is being refurbished near Kings Cross station in London and many well known personnel have moved on from, or changed, their roles within the Institute. We are very fortunate in IOPS in the calibre of our committee. Unlike many other branches in the UK, we do not struggle for nominees for the committee. However, if you'd like to join the committee in the future, look out for the e-mail giving details of vacancies (normally in May/June time).

The core functions of the IOPS committee are to prepare an activity plan and associated budget; organise and deliver activities (within the Institute policies and guidelines); report on activity and expenditure; and management of IOPS finance within the financial regulations of the Institute. The committee meets four times a year, and its meetings move around the major urban centres in Scotland. This year, Gail

Millar takes over as Secretary while all of the other Office Bearers remain the same. Ian Galbraith joins the committee, Francisco Perez-Reche (Paco) moves onto the committee from being co-opted and Gordon Robb remains on the committee for another three-year term. We say goodbye and thank you to Nick Hood, Robert Stamps and Gregor Garbutt.

We'd like to invite all IOPS members to join us at our December meeting on 4 December 2014 at the University of Strathclyde, Glasgow, where our guest will be Paul Hardaker, CEO of IOP. Paul will outline the new IOP five-year strategy and update us all on the developments in building work and staffing structure of IOP. We want to meet you, to answer any questions you may have and to hear your ideas for the future development of the Institute of Physics in Scotland. If you'd like to attend, please e-mail Gail (gailmillar@gmail.com) in advance to help with catering plans.

Further information on this event and our other activities can be found at <http://iopscotland.org/>.

On behalf of the committee

Avril Manners
Chair, IOP Scotland



Highlights of 2013

- Lab in a Lorry visited 50 schools in 28 local authority regions, 36% in either remote rural, accessible rural or remote small town, 52% in areas of socioeconomic deprivation; reached 10,220 pupils, recruited 203 volunteers and made use of 411 volunteer days.
- IOP public lecture series launched in Aberdeen and Glasgow, in addition to the well established, ever popular, Edinburgh series.
- An increase in “Promoting the Uptake of Physics and Engineering by Girls” events from one to seven.

Activities and Outreach

The Institute of Physics in Scotland actively encourages its members and others to communicate exciting aspects and applications of physics to a wide audience. The Institute in Scotland’s grant scheme is designed to give financial support of up to £2500 (under exceptional circumstances and with the appropriate justification, additional financial support may be considered) to individuals and organisations running physics-based events and activities. 13 science engagement grants were approved amounting to a sum of £15,812 being awarded to a variety of projects.

The grants awarded were:

• Making Waves	£2500
• Orkney International Science Festival	£690
• Blackridge Primary School	£250
• Williamwood STEM Fair	£250
• Girls into Physics	£4000
• Lighting up the Curriculum	£2500
• Barrhead High Renewable project	£500
• Mobius Loop	£672
• Craigmount Cansat competition	£1500
• Street Science	£1500
• S@S Accelerate Strathclyde Summer School	£500
• Nuffield Celebration Event	£700
• Bridle Canal Festival	£250

An event was held in partnership with the Met Office to unveil Lewis Fry Richardson’s plaque at Eskdalemuir Observatory. The day had a full attendance and gained a good deal of media attention.

The long-established IOPS Seniors’ Group continued to have excellent attendances at their meetings in Glasgow, Edinburgh and Aberdeen, ably organised by John Higinbotham. The Edinburgh lecture series, organised by Robert Thomson, continues to attract an excellent turn-out. Public lecture series were launched in Aberdeen and Glasgow and both turned out to be very popular.

IOP Scotland also works with other like-minded organisations, such as STEMNET, to celebrate the diversity of physics through educational and outreach volunteer projects.

Careers

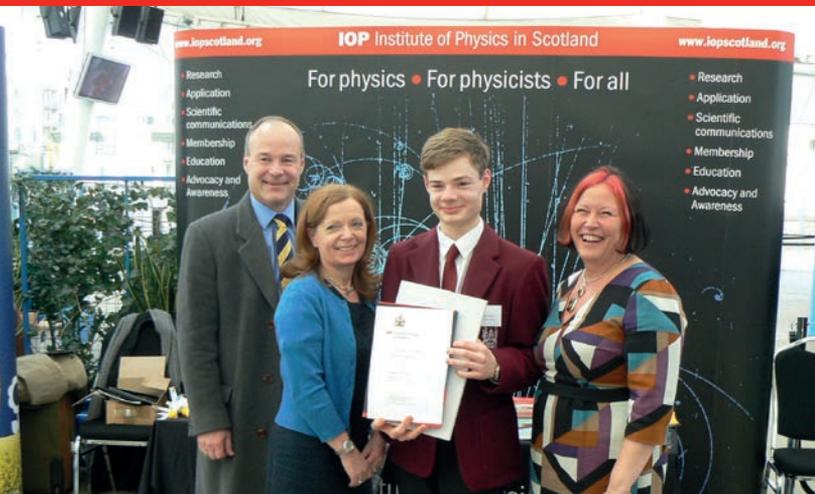
Two careers evenings were held in Glasgow in partnership with TUVNEL and Seagate with around 20 students attending each. Another careers evening, organised by IOP HQ, was also held in Glasgow and had around 60 students attend. The National Officer attended two university careers events with the IOP stand and materials.

Membership

The results from our annual survey of first-year students of physics were published: www.iopscotland.org/news/14/page_63161.html.

A legacy dinner was held on 16 April 2014 at the National Museum of Scotland.

An IOPS Young Members Group (YMG) was launched in 2014 to act as a forum for early-career members to meet, network, develop ideas, collaborate and share employment opportunities. The YMG hosts events



throughout Scotland every two months with talks from young members from both industry and academia. The talks are particularly aimed at giving career advice to young members.

Industry and Innovation

The IOP's "Top50" Work Placements Scheme is an initiative set up by IOP to help penultimate year undergraduate physics students gain experience in a business, university or research institution. Three students carried out work placements in the scheme in Scotland.

An event in partnership with the SCDI took place on 7 November 2013 in the evening in Glasgow. It was billed as an Influencer's Dinner and Chris Dorman, CEO of Coherent, spoke about photonics. 40 people attended.

Education

Promoting the Uptake of Physics and Engineering by Girls

The number of events held in Scotland between September 2013 and June 2014 went from one to seven. This increase was mainly due to the original event at George Watson's College being used as a continuing professional development event for staff.

The locations used were in Edinburgh, Ayr, Saltcoats, Port Seton, Livingston, Vale of Leven and Cumbernauld. At all of the events except Cumbernauld, the girls had an introductory talk from a guest speaker. These guest speakers were young women who had studied either physics or engineering and who were now in the early stages of their career. Not all of the speakers were directly using their degrees but had used them to make the transition from university to the workplace.

The girls then went to a series of workshops where they were given hands-on experience of the type of activities that engineers/physicists do in either the workplace or at university. These workshops were hosted by local companies and universities.

At St Maurices in Cumbernauld, Gail Millar gave

the girls in S1 a short interactive talk about "What Is a Physicist?" and then the girls used spaghetti and marshmallows to build as high a tower as they could. This was repeated at a second session for their S2 pupils.

All of these events could not have happened without the help and financial support from IOPS and Women into Engineering Scotland (WES). Also the individual schools gave their premises

Physics Teachers Network

During 2013–14 all of the network co-ordinators organised and delivered a number of CPD events for teachers across Scotland. The focus was on the changing curriculum with emphasis on practical work for the new physics courses, especially the Researching Physics unit of the Higher, and on using the Photonics Explorer kit promoting pupil hands-on optics work. In addition, many sessions were delivered by the team, including in Dundee, the Royal Observatory Edinburgh, often in collaboration with Gregor Steels of SSERC and with the Association for Science Education. The team also co-ordinated the Scottish Teltron tour, which focussed on practical work for Higher and Advanced Higher physics. The IOP Physics Teacher Network in Scotland also held yet another brilliant family day, at Glasgow Science Centre on 20 June. Drew Burrett was appointed as a new co-ordinator for the West of Scotland.

Physics Advanced Higher Support Meeting

Representatives from six universities, IOP network co-ordinators, SQA staff, STEMNET representatives and LEA officers met at SSERC to discuss the support that is available to AH students. The university reps outlined what each is currently doing, and the group looked at ways in which this could be extended and made more widely available. The STEMNET Cloud Chamber initiative was demonstrated and discussed, along with the possibility that universities could perhaps facilitate the provision of dry ice to schools.

Image captions: (cover)

Lab in a Lorry in action.

(inside pages, left to right):

Bike Busking at the Edinburgh

International Science Festival.

Rob Varley, Met Office, and Paul

Hardaker, IOP, unveil the plaque

to Lewis Fry Richardson at

Eskdalemuir Observatory.

Lab in a Lorry in action.

Physics in the Field team at

Lochaber Highland games.

IOP treasurer, Bill MacPherson

at a Girls into Physics day.

Physics award winner at Science

at the Parliament.

Total membership for IOPS is approximately 3114

Fellows/	250
Honorary Fellows	
Members	883
Associate	327
Students	1134
Affiliated	375
Affiliated schools	124
IOPimembers	5

Stirling Meeting

This meeting was held on 21 May 2014, with approximately 150 delegates and 20 exhibitors in attendance. The evaluations are very positive and the meeting appears to have been very successful.

Two members of the Planning Group have given notice of their intention to retire after this year's meeting and one new member has been recruited. A further new member is being sought.

Scottish Summer School

This event took place from 22 to 24 May 2014. Practical sessions were held at SSERC in Dunfermline, with accommodation at the King Malcolm Hotel. The programme included a full-day visit to Heriot-Watt University. Delegates also attended the Stirling Meeting (see above) at no additional cost.

The course was again oversubscribed and the number of delegates was increased from 20 to 25, and the evaluations were extremely positive.

Teacher Awards

We received four strong nominations for the Scottish Teacher of the Year Award, and a teleconference was held on 2 June to select our preferred candidate. It was decided that Lorna McGarty of Holy Rood RC High School in Edinburgh should receive this award.

SQA Achievement Awards

A total of five students were presented with Excellence in Physics Awards as a result of their performance in the SQA Physics Higher and Advanced Higher exams. The awards were presented at the Science and the Parliament event at Our Dynamic Earth in Edinburgh.

Learned Societies Group on Scottish Science Education

The LSG has commissioned Pye-Tait to carry out a survey on Science Resource Provision in Scottish Schools, similar to the one carried out in England. It is also carrying out a survey on Curriculum Structure and Uptake in the Sciences in Scottish schools. Both of these surveys are now "live" and it is hoped to have the results for the start of the new session. Dialogue with the General Teaching Council Scotland continues on the subject of entry requirements for Initial Teacher Education courses.

Policy

An Engineering Policy Group Scotland (of which IOP Scotland is a member) Holyrood seminar, on fracking, was held on 26 February 2014. It was a success with around 70 attendees, an excellent speaker and a lively, engaging discussion following the talk.

IOPS responded to the following consultations: The Scottish Science Advisory Council's (SSAC) consultation on the possible implications for science and engineering in Scotland in the independence debate and SSAC's consultation on Scientific Infrastructure and Scotland's needs and requirements for the future. This followed a House of Lords Select Committee on Science and Technology report on Scientific Infrastructure published in November 2013: www.parliament.uk/business/committees/committees-a-z/lords-select/science-and-technology-committee/news/scientific-infra-report-published/.

Prof. Muffy Calder sent a letter to the CEO of IOP canvassing views on "Future and Emerging Technology" in a Horizon 2020 context.

IOP Scotland continued to have a strong presence at the cross party group on science and technology, which discussed the Large Hadron Collider and its economic and cultural benefits.

Awards

Coherent Scotland Ltd in Glasgow received an Innovation Award from IOP for the development of a laser system that is transforming doctors' and biologists' ability to take quick and accurate medical images.

Congratulations go to Prof. James Hough, FRS, FRSE, who was awarded an OBE for services to science in the Queen's Birthday honours list.

Congratulations are due to Prof. Miles Padgett of the University of Glasgow who has been elected as a Fellow of the Royal Society and was awarded the Kelvin Medal (Senior Prize) for his outstanding contribution to the field of optics through his pioneering work on orbital angular momentum, his promotion of a global community of researchers in this field and his commitment to the public engagement of science.

IOP would also like to congratulate the four physicists who have been elected as Fellows of the Royal Society of Edinburgh: Robert Ivison, Director for Science, European Southern Observatory; Malcolm McMahon, Professor of High Pressure Physics, University of Edinburgh; Carol Trager Cowan, Reader in the Department of Physics, University of Strathclyde; and Gillian Susan Wright, Director of STFC UK Astronomy Technology Centre.

Looking forward to 2014/15

- Launch of IOP Scotland Facebook and Twitter pages.
- Report published on graduate destinations.
- Higgs competition prize winners announced.
- A vibrant programme of public events for the International Year of Light 2015

With thanks to the IOP Scotland committee for their contributions to this report.

Institute of Physics in Scotland

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