

National News

Autumn 2012

A further boost for physics

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This summer saw an increase in the number of students choosing to sit examinations in physics, which is the sixth year running that physics has been on the rise. The total number of students entered for physics A-level was up by 5% from 32,860 in 2011 to 34,509 in 2012 and physics is now the ninth most popular subject. At the risk of blowing our own trumpet, new data collected suggests that the Stimulating Physics Network (SPN) has played a major part in this increase in the number of students choosing to pursue physics post-16.

The rise in the number of students choosing to take physics at A-level in SPN Partner Schools – schools that have worked closely with one of our Teaching and Learning Coaches – correlates strongly with the overall increase in the number of examination entrants at AS level. A survey of the 276 Partner Schools (which comprises just under a tenth of all state schools in England) indicates that there has been a 30% increase in uptake of AS level physics over the past year in these schools. This is in contrast to a 1.7% increase across all schools and suggests that this year's increase of 982 students sitting AS in 2012 is largely made up of students from our Partner Schools. The long-term impact of SPN is even more striking as Partner Schools who have been working with us for two to three years report an average increase of 70% in the number of boys and 200% in the number of girls going on to take physics A-level.

▶ The impact of SPN

“The great news is our P2 results were outstanding and a massive improvement on the P1 results. I am much indebted to you for all your help.

“We had full retention to A2 (and decent grades) and recruited 11 good students to AS, so improving. SPN gave us a boost when we needed to raise the physics profile.

“Thank you for the brilliant CPD on the air track! - I taught the Y11 lesson yesterday and it was a complete success thanks to your advice and direction.”

Feedback from SPN Partner School

Our government-funded network, run by a partnership between the IOP and the National Network of Science Learning Centres, focuses on working directly with science departments, tailoring our support to suit the specific needs of non-specialist physics teachers. Each Teaching and Learning Coach works with a maximum of twelve schools, enabling them to develop a good

relationship with the whole science department and so determine what continuing professional development (CPD) will have the greatest impact on physics teaching and learning across the school. In parallel to this intensive relationship, our Physics Network Coordinators work to support all teachers of physics through a wide range of CPD activities including twilight workshops, day events and student resources, all of which are free to access.

▶ The impact of SPN

“Just got to write to tell you about how brilliant your input has been in helping to not only improve my lessons, but also, to improve the exam performance of my students. What you showed me was especially useful because after your demonstrations, I was immediately in a position to make massive improvements not only to my own teaching, but also, help teachers improve their practice, too.”

Feedback from SPN Partner School



While the continued rise in the number of students taking physics is encouraging, we are still facing a national shortage of specialist physics teachers, and so the SPN aims to offer all teachers access to our physics specialists to give them the confidence and knowledge to inspire their students with the excitement and potential of physics.

Contact your regional SPN team to find out how to access our support: stimulatingphysics.org.uk/regions

School over the summer

Our annual summer schools form a core part of the Stimulating Physics Network, bringing together non-specialist teachers of physics from all our Partner Schools. Over 100 teachers joined our teams of Teaching and Learning Coaches in York and in Oxford to take part in four days of intensive hands-on workshops to develop subject knowledge and pedagogy. Teachers that had been working with SPN for a year explored core topics such as forces, energy and electricity, while teachers in their second year as an SPN Partner School had the chance to build on what they had learnt in the previous year including waves, momentum and datalogging.

The aim of the summer schools is to help teachers feel more confident about teaching physics; enjoy the subject more; make physics more interesting for their students; and broaden their understanding of physics. Summer schools are held each year for teachers from all SPN Partner Schools.



"Great practical sessions, misconceptions cleared."

"A few of the most soul searching, inspirational days of my life."

"This workshop really made me question what I understood - very helpful!"

"Nice easy demos which were practical for classroom."

"This has been a wonderful experience and has enriched me/my practice. I can't express how much I have enjoyed being able to speak with experts and colleagues and experience practical advice. Socially it has been great and the whole experience has been great."

Summer school participants

➔ Visit stimulatingphysics.org/summerschools or contact Tamsyn Hyatt: tamsyn.hyatt@iop.org for more details

Stimulating Physics Support

Stimulating Physics Support (SPS) is a new programme within SPN which aims to provide support to physics teachers in the early stages of their career. Research has shown that in their first few years in the classroom, teachers find it especially difficult to access personal development opportunities. Our new team of 26 SPS Mentors, funded by the Department for Education, are experienced physics practitioners who will provide a programme of personalised support for newly qualified teachers of physics from PGCE to NQT+1.

The mentors will be offering one-on-one contact as well as creating local networks through events and online communities. So far over 600 PGCE students and NQTs



have registered for this early career mentoring, with more joining over the autumn term.

Our team of SPS Mentors will also run local CPD events open to all early career teachers of physics. See the regional pages for the next events or get in touch with SPN.

➔ Visit iop.org/sps for more details or contact Eliza Selley: eliza.selley@iop.org

Girls in physics

While the number of students studying physics post-16 has been increasing, the number of girls taking A-level physics has remained relatively unchanged and is very low compared to the gender split in the other two sciences. In order to try to address this imbalance, the Stimulating Physics Network has facilitated a 'Girls in Physics' action research programme with teachers from 23 of our Partner Schools, exploring what might influence the uptake of A-level physics by girls, and evaluate the impact of different interventions intended to increase girls' engagement with physics.

The common starting point was to survey pupils' perceptions of physics and/or their intentions regarding A-level choices, and then repeat the survey after a specific intervention which aimed to raise pupils' enthusiasm for physics and/or their understanding of the potential of physics in future career choices. By comparing the two surveys, it is possible to begin to identify the impact of different activities. Interventions undertaken varied from school to school

but included common elements, such as:

- A series of events, pupil shows and/or taster lessons led by the Teaching and Learning Coach and supported by the physics teacher;
- Activities highlighting career opportunities related to physics, either within physics lessons, as separate events and workshops or through classroom displays;
- The introduction of new teaching strategies to encourage girls' engagement with physics, specifically changing questioning techniques;

In all the cases where a 'before and after' survey was conducted, positive outcomes were reported. Due to the nature and time-scale of the action research projects, these outcomes by necessity reflect short-term impact but they provide a valuable starting point in working to engage more girls in physics.

➔ The SPN Girls in Physics interim report will soon be available online at stimulatingphysics.org/news

Exoplanets

The 'Exoplanet Physics Project' is a new, competitive physics project for teams of Year 9 pupils in SPN Partner Schools aimed at engaging pupils in physics, assisting the establishment of science clubs, and encouraging the uptake of physics at A-level.

Using a dedicated online forum, each team is supported by an 'Advisor' – a Sixth Form physics student in another school, carefully selected from the Institute of Physics' 16-19 Membership base. The project runs over eight weeks and is a coherent, structured introduction to the principles used by astronomers in the hunt for Earth-like planets beyond the solar system. Throughout the project, teams submit their work and findings on their own team blog. Submissions are judged by representatives from the National Space Centre in Leicester and the Planethunters group in Chicago. Winning teams receive iTunes vouchers for each pupil and a compact digital camera for the physics department. All resources are provided at no cost to the school by the Stimulating Physics Network, including workbooks and kit to build simple experiments and demonstrations.

The structure, content and resources for the Exoplanet Physics Project have been developed by experienced physics teachers and experts in science education. Students will learn about the transit method of planetary discovery, light curve graphs, habitable zones, astronomical spectroscopy and how these can be combined to identify Earth-like planets. They will use simple kit to model these principles and make calculations, and prepare a final proposal for submission.



The project runs over a period of eight weeks and will take place each term:

- **Spring:** Monday 14 January – Friday 15 March 2013
- **Summer:** Monday 22 April – Friday 21 June 2013

All SPN Partner Schools have an entitlement to the Exoplanet Physics Project during their two years of engagement with the Stimulating Physics Network (SPN).



➔ For more information please contact Boe Leung: boe.leung@iop.org or visit stimulatingphysics.org/EPP

► Get in touch

To get connected with the Stimulating Physics Network contact your regional External Liaison Officer. They will be able to give you details of events and courses happening across your region. If you want a workshop on a particular

day then you could create a cluster group with two or three other schools and look to organise a session with a Physics Network Coordinator for a day and time that suits you. Contact your External Liaison Officer to find out more.

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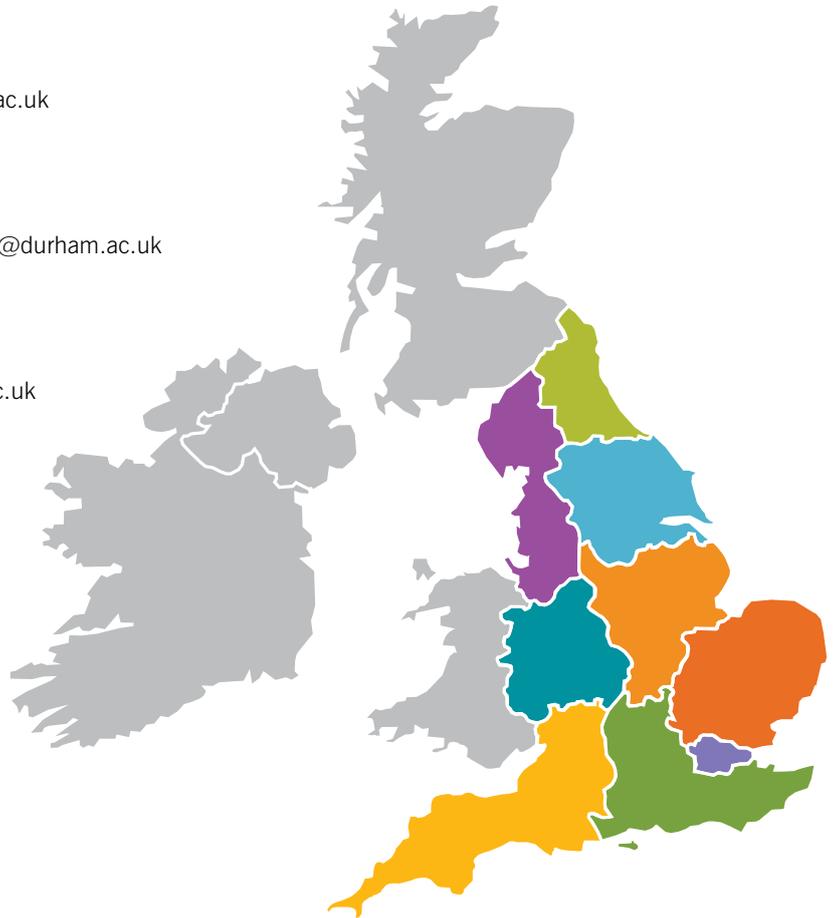
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The Stimulating Physics Network is now connected across Twitter. Follow Stimulating Physics @TakeOnPhysics for local events, physics in the news and inspiring ideas from our team of expert physics teachers.

What the Stimulating Physics Network offers...

- A coherent nationwide programme of support for all physics teachers, available at no cost to all schools in England
- An online professional community, providing ideas and advice for teaching physics: talkphysics.org
- A portfolio of resources for teaching and learning, developed by the Institute of Physics
- Support in engaging students with physics at KS3 and KS4, to encourage increased post-16 physics uptake
- A grassroots network - run by teachers for teachers
- Bespoke CPD for clusters of schools, focused on specific physics topics
- Workshops exploring engaging and practical activities and teaching approaches

“Great ideas and simple demonstrations... Gave me new inspiration”

Teacher at a Stimulating Physics Network workshop

