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## Kittinger and Baumgartner: on a mission to the edge of space

Pendrill, Ann-Marie

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PO Box 117  
221 00 Lund  
+46 46-222 00 00



Education: Physics Education Networks meeting has global scale Competition: Competition seeks the next Brian Cox Experiment: New measurement of neutrino time-of-flight consistent with the speed of light Event: A day for all those who teach physics Conference: Students

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## YOUR NEWS WANTED

The news section gives updates on what has been happening in physics education worldwide. Items included show how events in one country could be relevant to good practice elsewhere in the world. Contributions are welcome from all of our readers. They should be about 200–300 words long and can include pictures. Please e-mail your news items for the July issue of *Physics Education* to [ped@iop.org](mailto:ped@iop.org) before 21 May 2012.

## EDUCATION

# Physics Education Networks meeting has global scale

On 16 January 2012, representatives from the Norwegian Physics Teachers Association and the UK Institute of Physics Teacher Network met in Oslo. It was decided at the meeting that the bodies would like to have further, more extensive meetings on a regular basis to discuss matters relating to networks supporting those teaching physics.

Currently, the meetings are focused on physics, education or physics education, but at the moment there is no meeting for people involved in physics teacher-support networks to discuss matters that are important for physics education—such as methods of dissemination—but which do not fall into the previously mentioned categories.

Here a network is defined as a number of people taking part in face-to-face meetings providing support to those teaching physics. Support may be defined in a number of ways—as training, representation and policy forming, for example.

At the meeting it was decided that it would be better to become part of an existing conference. GIREP was the obvious candidate and the first meeting is scheduled to take place at WPEC/GIREP in 2012.

The sessions at WPEC/GIREP (a presentation followed by discussion) will include:

- 1. Problems and solutions.** Problems such as ‘how do you get teachers to attend?’
- 2. Politics.** How have different organizations influenced education policy in their own country?
- 3. Competencies.** What makes a physics teacher and what should networks provide teachers by way of support?
- 4. Administration.** Budgets, acquiring funding and reporting on activities.

The poster session can be used to explain how people’s networks operate, so presentations covering similar ideas are not needed.

If you would like to discuss a problem (and possibly present a solution), or if you would like to make a short presentation about one of these topics before the discussion, please contact [carl.angell@fys.uio.no](mailto:carl.angell@fys.uio.no) or [gary.williams@iop.org](mailto:gary.williams@iop.org).

There are obvious areas of overlap that might concern GIREP members, but these networks have a very specific need and the intention is to keep discussions focused. For example, competencies (point 3 above) would also be of interest to teacher trainers and

## Timetable

### Tuesday

- 11.30–14.00** Posters  
**14.00–15.45** Problems and solutions  
**15.45–16.00** Short break  
**16.00–17.10** Influencing policy  
**17.10–17.20** Short break  
**17.20–18.00** Influencing policy

### Wednesday

- 08.45–09.45** Competencies  
**09.45–10.15** Coffee break  
**10.15–11.15** Competencies  
**11.15–11.30** Short break  
**11.30–12.30** Administration  
**12.30 onwards** Discussion and possible vote on whether to form a Physics Education Networking GIREP subgroup

physics-education researchers, but our context would be how those competencies give direction to networks providing professional development.

Those attending should register as normal for GIREP. Contact [carl.angell@fys.uio.no](mailto:carl.angell@fys.uio.no) or alternatively [gary.williams@iop.org](mailto:gary.williams@iop.org) for more details.

**Gary Williams**

## COMPETITION

# Competition seeks the next Brian Cox

On 22 February 2012 the Institute of Physics Manchester Branch hosted its first Young Persons Lecture Competition at Manchester Metropolitan University, UK. Speakers were required to present for 10 minutes on a physics topic of their choice and were then grilled by the audience. The competition was open to everybody under the age of 26: A-level students, undergraduates and postgraduates (including PGCE students). Entries were received from all of these classes.

Just reaching the competition was an achievement—selection was based on the quality of a submitted abstract and due to time constraints only six out of the 24 entries were chosen.

The evening started with Shahid Lakha speaking on the challenging topic of quantum teleportation, followed by Katie Dobson speaking on beer and the physics of keeping it cool. She gave a clear and entertaining talk and was not put off her stride when one of the judges proved unable to take his drink—dropping the demonstration bottles on the floor. The final talk before the break was given by Patrick Jenkins on ‘Vortices—whirlpools and maelstroms’, a beautifully illustrated explanation of the physics of these fascinating natural phenomena. Next Connor Galbraith gave an impressive talk on the subject of ‘Deadly attraction—new frontiers in the physics of antimatter’. From the limits of high-end research to the physics that is all around us, Alexander Casalis de Pury spoke on the



*One of the participants in action at the lecture competition.*

subject of ‘What we learned ages ago and the cost of forgetting it’, illustrated with lively practical demonstrations. Finally, Damien Trinh gave a well planned and expertly explained presentation on ‘Counting aliens with the Drake equation’.

The four judges—Francesca Wheeler, Louise Butcher, Phillip Latchem and Peter Rowlands—had a difficult task in choosing the winners. After careful consideration, the first prize of £100 was awarded to Damien, with second prizes of £50 each for Connor and Alexander (with Connor winning the under-18

category). The event attracted an enthusiastic audience of more than 50 people who challenged the speakers by asking insightful and relevant questions. When Damien was awarded the prize his friends seemed almost as excited as he was (perhaps they were hoping that he would share his winnings when they adjourned to the pub later). The organizing committee would like to thank all of the students who participated for their outstanding presentations and also all of those who submitted abstracts.

**Sarah Haigh**

## EXPERIMENT

# New measurement of neutrino time-of-flight consistent with the speed of light

On 16 March 2012, the ICARUS experiment at the Italian Gran Sasso laboratory reported a new measurement of the time-of-flight of neutrinos from CERN to Gran Sasso.

The ICARUS measurement, using last year's short pulsed beam from CERN, indicates that the neutrinos do not exceed the speed of light on their journey between the two laboratories. This is at odds with the initial measurement that was reported by OPERA last September.

'The evidence is beginning to point towards the OPERA result being an artefact of the measurement,' said Sergio Bertolucci, research director at CERN.

'But it is important to be rigorous,' continued Bertolucci, 'and the Gran Sasso experiments, BOREXINO, ICARUS, LVD and OPERA, will be making new measurements with pulsed beams from CERN in May, to give us the final verdict.'

'In addition,' said Bertolucci,

'cross-checks are underway at Gran Sasso to compare the timings of cosmic ray particles between the two experiments, OPERA and LVD. Whatever the result, the OPERA experiment has behaved with perfect scientific integrity in opening their measurement to broad scrutiny, and inviting independent measurements. This is how science works.'

The timing of the ICARUS experiment is independent from OPERA and measured seven neutrinos in the beam from CERN last year. These all arrived in a time consistent with the speed of light.

'The ICARUS experiment has provided an important cross-check of the anomalous result reports from OPERA last year,' said Carlo Rubbia, Nobel prize winner and spokesperson of the ICARUS experiment.

'ICARUS measures the neutrino's velocity to be no faster than the speed of light. These are diffi-

cult and sensitive measurements to make and they underline the importance of the scientific process,' Rubbia elaborated.

'The ICARUS Liquid Argon Time Projection Chamber is a novel detector that allows accurate reconstruction of the neutrino interactions comparable with the old bubble chambers that had fully electronic acquisition systems,' explained Rubbia.

'The fast associated scintillation pulse provides the precise timing of each event, and has been exploited for the neutrino time-of-flight measurement. This technique is now recognized worldwide as being the most appropriate for future large-volume neutrino detectors,' said Rubbia.

If you would like to find out more and keep up to date with this research then you can visit the CERN website at <http://press.web.cern.ch/press/PressReleases/Releases2011/PR19.11E.html>.

## EVENT

## A day for all those who teach physics

The Institute of Physics, Science Learning Centre North East and Durham University would like to invite all those who are involved in the teaching of physics to the North East Physics Teachers Conference, to be held on 21 June 2012 at the Ogden Centre, University of Durham, UK.

This popular and exciting event

will include a keynote speech by forensic scientist Prof. Julie Mennell.

There will also be a choice of workshops, including 'Physics and toys', 'Jolting the jaded—do physics', 'Medical physics' and an iPad workshop.

There is no charge for attendance and lunch is provided; how-

ever, booking is essential.

For further information and to book your place at this fabulous upcoming event, please contact Nicola Hall at Science Learning Centre North East (tel 0191 370 6200 or e-mail n.l.hall@durham.ac.uk).

**Carol Davenport**

## CONFERENCE

# Students attend first Anglo-Japanese international science conference

On 9 March 2012 St Paul's School in London played host to an international science conference with a difference—all of the talks and posters were delivered by school students, reporting on independent research work that they had carried out while studying for their A-levels.

Half of the students came from Japan and were presenting in a language that they had only recently begun to learn in school, which was an impressive feat.

Sixteen schools from Japan, supported by the Ministry of Education, Culture, Sports, Science and Technology, visited the UK for a variety of science activities, which culminated in this conference.

Jishukan High School, a Super Science High School in Aichi Prefecture, led and organized the event, spending months preparing the students in their English and presentation skills.

In the UK, students came from St Paul's Boys and Girls, Latymer Upper in London, King's School Canterbury and the Simon Langton Boys Grammar School in Kent.

All of the speakers delivered their talks with confidence and panache across a range of topics from radiation detection to flight, a school-based video game, as well as many biological and chemical subjects.

With more than 100 visiting students and a similar number from the home team in the audience at times, there was a won-



*The conference gives students experience in presenting their work.*



*Students enjoy meeting with their peers at the conference.*

derful atmosphere.

For the teachers it was gratifying to see the students perform well on stage, ask intelligent questions and mingle at the poster sessions, genuinely interested in the work of their peers.

In every respect this was like a normal science conference—international, with original work and a fantastic opportunity for students to mix and discuss science. As a format to stretch the

most able students it worked beautifully—informing on how science works and getting students doing science properly—and as a way of waking the rest of the school up to possibilities in a busy science department it was great advertising.

I look forward to the same again next year, although perhaps with more administrative help.

**Ken Zetie**

## CELEBRATION

# Will 2015 be the ‘Year of Light’?

The European Physical Society (EPS) is to make a formal request for United Nations (UN) endorsement of 2015 as an ‘International Year of Light’.

The project aims to promote wider understanding of the fundamental role that photonics plays in today’s society, attract more young people to study the subject and demonstrate how optical technologies are critical to sustainable development and helping developing countries.

Luisa Cifarelli, the EPS president and chair of the steering committee directing the effort, said: ‘Light is an immediate and fascinating topic, but also inter- and multi-disciplinary in all its numerous forms. It is ideal to be chosen for the declaration of an “International Year”’. The EPS has been working on the idea for the past two years along with other photonics organizations, including SPIE, the Optical Society of America, the International Commission on Optics and Photonics21, and has published a prospectus outlining its proposal, which can now be accessed from the society’s website.

The International Union of Pure and Applied Physics has already backed the idea in a meeting hosted by the Institute of Physics in London, UK, in November 2011.

The idea needs to be proposed by an executive of the UN Educational, Scientific and Cultural Organization (UNESCO) and would then be approved at a forthcoming UN or UNESCO General Assembly meeting.



*Portable optical tuberculosis diagnosis is an example of how optical technologies are being used in medicine.*

## Reaching out

John Dudley from the Université de Franche-Comté in France, secretary of the steering committee that is directing the project, said that a key part of the reasoning behind the ‘International Year’ idea was to address the problem that optical technologies are little understood and appreciated outside of the field, despite the enormous impact that they have had on human society, from opening up global communications and the internet to submarine optical links and revolutionary technologies used in medicine.

He adds that it will be important to go beyond the celebratory nature of the ‘Laserfest’ events

held in 2010 to commemorate the invention of the laser in 1960, and to present to the UN a range of activities including outreach and education, as well as the impact of optics and photonics, both in science and wider culture.

‘As the application of light through the field of photonics becomes the key cross-cutting discipline of science in the 21st century, it is critical that the brightest young minds continue to be attracted into science and engineering careers in this field,’ stated the EPS.

If accepted by the UN, the proposal would follow the International Year of Physics in 2005, which celebrated the centenary

of Einstein's initial papers on relativity, and the International Year of Astronomy in 2009, which saw the production of thousands of high-quality, low-cost 'Galileoscopes', which are designed to engage children's interest in the subject of astronomy.

### Key themes

The EPS prospectus identifies four key themes around which the year-long activities celebrating the science and application of light-based technologies would likely be based. They are:

- the science of light, showing how optics and photonics are fundamental to all science;
- tools for the future, highlighting the application of photonics in key fields such as medicine, energy and communication;

- light for development, promoting photonics technologies such as advanced lighting, solar power and water purification;
- pioneers of light, celebrating the scientific contributions made by the study of light through educational and outreach activity, including associating each month of the year with a particular scientist and their contribution to the field.

The year 2015 would appear to be perfect timing from a historical point of view, given the remarkable number of anniversaries relating to optical science.

- It will be 200 years since Fresnel's introduction of the theory of light as a wave.
- It will be 150 years since

Maxwell described the dynamic electromagnetic theory of light.

- It will be 100 years since Einstein and Hilbert showed how light was at the centre of space and time through the theory of general relativity.
- It will be 50 years since Penzias and Wilson discovered the cosmic microwave background, or 'afterglow' of the big bang.

The EPS is welcoming more partners to become involved in the 'International Year of Light' venture. For further details, contact the project secretary John Dudley at [john.dudley@univ-fcomte.fr](mailto:john.dudley@univ-fcomte.fr), or alternatively [light@eps.org](mailto:light@eps.org).

**Gary Williams**

### TEACHERS

## Challenging our intuition in spectacular fashion: the fascinating world of quantum physics awaits

Quantum physics is a world of its own, inhabited by strong personalities and mythical creatures such as Schrödinger's cat, but also by mind-boggling experiments and theoretical rules that challenge our intuition while giving spectacular agreement with experimental results. How can we invite students into this fascinating world?

During the Teaching Quantum Physics symposium (11–13 July 2012) you can share teaching ideas and learn about research into students' conceptual understanding of quantum physics. Because the symposium is coordinated with the 44th conference of EGAS (the European Group

on Atomic Systems) in Göteborg, Sweden on 9–13 July, you also have a chance to listen to some of today's top researchers in this area. Teachers are invited to participate at student price.

The lecture programme includes:

- Eric Mazur—'Confessions of a converted lecturer';
- Per Delsing—'Is vacuum really empty?';
- Jeffrey Hangst—'The ALPHA experiment at CERN: physics with trapped antihydrogen';
- Robert Marc Friedman—'Remembering Miss Meitner: history, memory, and the future of physics';
- Judy Hardy—'Not what it

seems? Teaching and learning introductory quantum physics';

- Christine Lindström—'The knowledge structure of introductory quantum mechanics';
- Reidun Renstrøm—'Why do recognized textbooks in physics represent a quasi-history of Planck's, Einstein's and Bohr's development of quantum physics?—History and quasi-history of quantum physics'.

Read more about the event and register at <http://egas44.org/>.

**Ann-Marie Pendrill**

## RESEARCH

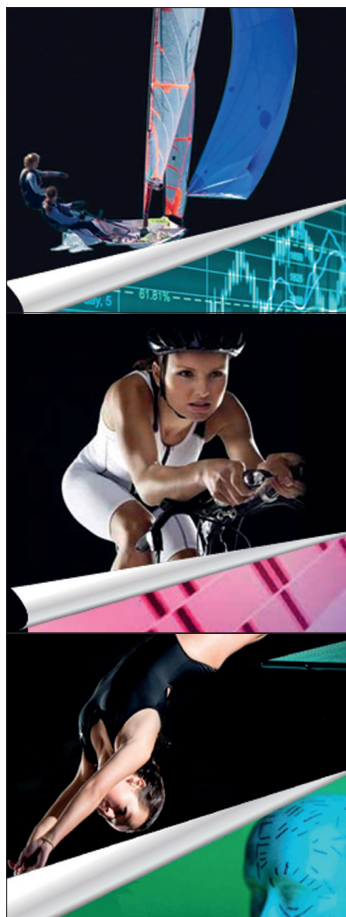
# Science sharpens up sport

Throughout 2012, join world-class researchers and top Team GB and Paralympics GB stars in six locations across the UK to see athletic demonstrations, discuss elite performance and share your views on the research behind the UK's sporting achievements.

Cutting Edge 2012 is a Research Councils UK initiative, in partnership with the Royal Institution, the Department for Business, Innovation and Skills, The Institute of Engineering and Technology, and PODIUM (the Further and Higher Education Unit for the 2012 Games).

Cutting Edge 2012 is one of the outstanding projects granted the London 2012 Inspire mark, the badge of the London 2012 Inspire programme, which recognizes exceptional and innovative projects inspired by the 2012 Games.

At Cutting Edge 2012: Behind Sailing, to be hosted by Weymouth Sailing Academy, an expert panel will take questions about the research that lies behind Team GB's world-class performance. This interactive evening will feature a top Team GB sailor who will discuss their experience using the latest research in their quest for success. Prof. Steve Haake will host sailing enthusiasts Prof. Glen McHale, who develops high-tech surfaces to reduce drag in boats, and Dr Judith Wolf, an expert in coastal modelling of tides, currents and waves, and the brains behind Team GB's gold medal at the Seoul Olympics. Dr David James will lead discussions on how far research and new tech-



*Cutting Edge 2012 sports.*

nologies should be used in the quest to win gold.

Come along to the world-class Plymouth Life Centre for Cutting Edge 2012: Behind Diving to hear about the research that lies behind the perfect dive. Andy Banks, coach of Team GB stars such as Tom Daley, will discuss how research brings out the best in his athletes. Prof. Alan Wing, an expert in human movement, will discuss what his work tells us about how divers synchronize their movements,

## **Cutting Edge 2012: Behind Sailing, 24 May 2012**

7.00 a.m.–8.30 p.m.

Weymouth Sailing Academy

## **Cutting Edge 2012: Behind Diving, 5 July 2012**

7.00 a.m.–8.30 p.m.

Plymouth Life Centre

## **Cutting Edge 2012: Behind Cycling, 19 July 2012**

7.00 a.m.–8.30 p.m.

Scottish Exhibition and Conference Centre, Glasgow

and Prof. Andrew Lane will discuss 'emotion regulation', working with athletes to maximize their performance under pressure. Sports scientist Prof. Steve Haake will host this interactive evening and Dr David James will again lead discussions.

Put your questions to the experts about elite sport and take part in a demonstration-packed, interactive evening for Cutting Edge 2012: Behind Cycling. A world-class cyclist will join panellists Dr Harry Rossiter, a physiology expert discussing how to enhance elite performance in sport, and Prof. Louis Passfield exploring the fine line between nutrition and doping in sport. Dr David James will lead the discussions for the third time in this Cutting Edge series of events.

Tickets are free, however, registration for the events is essential. Please register online at [www.rigb.org/cuttingedge2012](http://www.rigb.org/cuttingedge2012).

**Sakia Walcott**

## LEARNING

# Kittinger and Baumgartner: on a mission to the edge of space

On 15 March 2012, Felix Baumgartner jumped from 71 500 feet [1], a test jump as part of his attempt to beat the earlier record set by Joe Kittinger, who jumped from 102 800 feet in 1960, as part of the US space programme [2].

The ascent to these elevations in a helium balloon, followed by free fall, with varying temperatures and speed of sound, and increasing air resistance and density, can lead teachers and students to a discussion on many different aspects of physics.

I have often used Kittinger's jump as an example in class, starting by quoting a few lines from the *Guardian Weekly*: 'Joe Kittinger looks like a cowboy but he's an air force colonel and the first man in space. In 1960 he went up 20 miles in a helium balloon, a little silver bubble in the blackness. Half-way there his glove split, allowing deadly cold in. "I didn't tell my flight surgeon because I didn't want to worry him. I felt reasonably certain I could survive." At 103 000 feet he said a silent prayer—it had to be silent, there was no air—and jumped. "I fell face to earth for a little ways and I really had no sensation of falling because I had no visual reference. I turned over on my back about this time and I looked up and the balloon was racing into the heavens, just flying away. What it was, was that the balloon was standing still and I was the one that was falling." He fell at the speed of sound but

made no sound. No air rippled his space suit. After four minutes, he re-entered the atmosphere. He hit the desert and thought it looked like the garden of Eden. Someone patted his cheek.'

I let students read the text, discuss it and formulate questions. A large group usually raises a number of highly relevant questions, such as how can the balloon rise if there is no air? How can the balloon stand still after he jumps? What is the density and temperature of air 20 miles up? How large is gravity? How fast is the speed of sound there? How high can you go in a helium balloon? When does the atmosphere start?

These questions clearly invite good discussions about many topics and as a teacher you need to choose which path to follow, for example, Newton's laws, Archimedes' principle applied to gases, the variation of air pressure with elevation, what affects the speed of sound and how fast did Kittinger really fall?

Students might marvel that the ideal gas law makes the buoyancy of helium in air independent of the pressure as long as the balloon can expand freely.

Photos of the balloon on the ground invite discussions of how the pressure drops more slowly inside the balloon, due to the lower density of helium [3].

Students might discuss technology in the 1960s and wonder how colour photos of Kittinger

just before the jump were taken and transmitted back to Earth.

The upcoming attempt by Baumgartner could see him become the first person to go through the sound barrier—Kittinger was close, but as discussed by Robinson and Patrick [4], it seems that he did not fall faster than the speed of sound. Additional discussions of the physics involved can also be found in [5]. With the benefit of this background, students can follow the record attempt with added excitement and curiosity, and discuss Kittinger and follow Baumgartner's attempt.

## References

- [1] <http://redbullstratos.com/>
- [2] [www.pbs.org/wgbh/nova/escape/skydive.html](http://www.pbs.org/wgbh/nova/escape/skydive.html)
- [3] Viennot L 2006 Teaching rituals and student satisfaction *Phys. Educ.* **41** 4
- [4] Robinson A W and Patrick C G 2008 The physics of Colonel Kittinger's longest lonely leap *Phys. Educ.* **43** 477
- [5] [www.wired.com/wiredscience/2012/02/would-the-stratos-space-jump-be-similar-to-reentry/](http://www.wired.com/wiredscience/2012/02/would-the-stratos-space-jump-be-similar-to-reentry/) and [www.wired.com/wiredscience/2012/02/stratos-space-jump-can-you-fall-faster-than-the-speed-of-sound/](http://www.wired.com/wiredscience/2012/02/stratos-space-jump-can-you-fall-faster-than-the-speed-of-sound/)

**Anne-Marie Pendrill**

## INTERNATIONAL

# London International Youth Science Forum calls for leading young scientists



*Young scientists from the London International Youth Science Forum on the steps of the Albert Hall.*

The London International Youth Science Forum (LIYSF) offers a unique opportunity to participate in an international event that attracts more than 350 of the world's leading young scientists, aged 17–21, from more than 50 participating countries. They include the top prize-winners from the European Union Contest for Young Scientists and the Gold Crest award winners at the Big Bang Fair.

At a time when the sciences are of the utmost importance to all nations around the world, the

UK Prime Minister is endorsing the forum to stimulate the attendance of young scientists worldwide to come together to learn, exchange views and opinions, and share knowledge at this exciting and dynamic event.

LIYSF 2012 will take place on 16–30 August 2012 and will be based at Imperial College London. The forum will explore future developments in the sciences with leading scientists, dignitaries and industry pioneers who will give lectures throughout the event.

The theme this year will be based on 'Earth science: the human planet', but the forum will also cover all areas of science. Key elements of the programme include opportunities to visit industrial sites and world-class research institutions and laboratories.

You can see the range and scope of our event in our 2011 programme brochure available at [www.liysf.org.uk/Assets/liysf-web-brochure.pdf](http://www.liysf.org.uk/Assets/liysf-web-brochure.pdf) and all the latest news for LIYSF 2012 at [www.liysf.org.uk/Events-diary](http://www.liysf.org.uk/Events-diary).

Prof. Sir Roy Anderson will give the principal opening address on our 2012 theme: the human planet. Anderson is professor of infectious disease epidemiology at Imperial College London and has recently held the post of rector there. He is also chief scientific adviser to the UK Ministry of Defence.

There will also be a seminar day 'Overcoming disaster', led by Air Marshall Sir Colin Terry, dealing with the ways that we can cope with widespread problems such as disease epidemics, geological events such as desertification, floods, earthquakes and volcanic activity, and social aspects such as population growth and food supply.

Several other speakers have confirmed that they will be attending the event. They include Prof. Steve Cowley, director of Culham and chief executive officer of the UK Atomic Energy Authority; Prof. John Ellis, CERN theorist and Clerk



*The opening ceremony of the LIYSF celebrates its diversity.*

Maxwell professor, Kings College London; and Dr Aravind Vijayaraghavan, School of Computer Science, University of Manchester.

The cost of attendance can be a sticking point, but there are ways of obtaining funding and many students are successful.

We can help a school, organization or student by providing them with a detailed invitation

letter to approach companies to seek individual funding. We also have a small amount of scholarship funds available to help contribute to a student's attendance to further promote UK representation. We have many students in several other countries who have been successful in obtaining funds from a variety of sources.

**Richard Myhill**

## COMPETITION

# Physics paralympian challenge needs inquisitive, analytical, artistic and eloquent pupils

Following the success of last year's '2011 Physics Heaven', we present 'The Physics Paralympian 2012'.

This is a parallel competition for teams of four year-nine students (13–14 years old).

Do you have inquisitive, analytical, artistic and eloquent students? If so then your school can put together a team of four to compete in this year's competition against the year-nine talent of other schools across the East Midlands and East of England.

Teams of four students represent their school and gain points for correct physics ideas to explain the experiments they encounter.

This year the teams will do two investigations and four shorter experiments. The leading teams will make a presentation on one aspect of the physics.

The day ends with a lecture, followed by prizes and certificates. Can you win the prize of the ultimate physics paralympian?

The events will be held from

9.30 a.m. to 3.30 p.m. on 2 July at Northgate High School, Ipswich, Suffolk, and on 10 July at Uppingham Community College, Rutland. Book early to secure a place for your school.

For further information about the East of England event contact Gerry Blake (e-mail [g.blake@sep.org.uk](mailto:g.blake@sep.org.uk)) and contact Helen Pollard for details about the East Midlands event (e-mail [h.pollard@sep.org.uk](mailto:h.pollard@sep.org.uk)).

**Helen Pollard**

# Forthcoming Events

**If you have an upcoming event that you would like to publicize, e-mail [clare.thomson@iop.org](mailto:clare.thomson@iop.org).**

## May

**23** Stirling Physics Teachers Meeting, Stirling, UK. The 38th annual meeting, organized by IOP in Scotland. For information and booking, go to [www.stirlingmeeting.org](http://www.stirlingmeeting.org)

## June

**14** Rugby Meeting, Rugby School, Warwickshire, UK. The 24th Annual Meeting for Teachers of Physics in Schools & Colleges. For information and booking, go to [www.iop.org/rugby](http://www.iop.org/rugby)

**19** A meeting in Bangor, North Wales, UK, for all those who teach physics. With a lecture by Prof. Sir Peter Knight on lasers and a choice of workshops. Contact Andrea Fesmer, IOP Teacher Network Co-ordinator for North Wales at [andrea.fesmer@talk21.com](mailto:andrea.fesmer@talk21.com)

**22** A south-west day for physics teachers at St Luke's Campus, University of Exeter, UK. 10.00 a.m.–6.00 p.m. The event is free, but booking is essential. See [www.sciencelearningcentres.org.uk/centres/south-west/courses-and-events/40545-53657](http://www.sciencelearningcentres.org.uk/centres/south-west/courses-and-events/40545-53657)

**27** What Happens Next? A teacher workshop at Tunbridge Wells Grammar School for Boys, Tunbridge Wells, UK. 5.30 p.m.–7.00 p.m. Contact

Darrell Hamilton at [dahp.twggs@googlemail.com](mailto:dahp.twggs@googlemail.com) and see [www.stimulatingphysics.org/teacher-support-workshops.htm#lwhn](http://www.stimulatingphysics.org/teacher-support-workshops.htm#lwhn)

## July

**1–6** The First World Conference on Physics Education, Istanbul, Turkey. Initiated by GIREP and IPCE—commission 14 of IUPAP. Sponsored by GIREP, ICPE and the Multimedia in Physics Teaching and Learning (MPTL) group, and endorsed by the American Association of Physics Teachers (AAPT), Latin American Physics Education Network (LAPEN) and the Asian Physics Education Network (AsPEN). See [www.wcpe2012.org](http://www.wcpe2012.org)

**3–8** The Royal Society Summer Science Exhibition, Carlton House Terrace, London SW1, UK. This event is free to attend and open to all. For more information, go to <http://royalsociety.org/Summer/2012>

**6–8** Summer Physics Update, University of Birmingham, UK. A three-day residential course for practising physics teachers. For information and booking, go to [www.iop.org/update](http://www.iop.org/update)

**11–13** A symposium on teaching quantum physics, Göteborg, Sweden. Coordinated with the 44th Conference of the European Group on Atomic Systems (EGAS). Visit the website at <http://egas44.org>

**15–20** The Goldsmiths' Company free residential courses for UK teachers (including particle physics and materials science), Brunel and Cambridge universities, UK. See [www.thegoldsmiths.co.uk/charity-education/education/science-for-society-courses](http://www.thegoldsmiths.co.uk/charity-education/education/science-for-society-courses)

**15–24** International Physics Olympiad, Tallinn and Tartu, Estonia. For more information, go to [www.ipho2012.ee](http://www.ipho2012.ee)

**28 July–1 August** AAPT Summer Meeting, Philadelphia, PA. For more information go to [www.aapt.org](http://www.aapt.org)

## August

**5–12** Senior Space School UK 2012, University of Leicester (for 16–18 year olds). For more information, go to [www.spaceschool.co.uk](http://www.spaceschool.co.uk)

**16–30** London International Youth Science Forum (LIYSF), London, UK. The two-week residential forum attracts more than 350 of the world's leading young scientists, aged 17–21 years, from more than 50 participating countries. For more information, go to [www.liysf.org.uk](http://www.liysf.org.uk)

## September

**4–9** British Science Festival, Aberdeen, UK. A celebration of science, engineering and technology, and the role they play in our lives. See [www.britishscienceassociation.org/web/BritishScienceFestival/](http://www.britishscienceassociation.org/web/BritishScienceFestival/)