Meeting: Brecon hosts 'alternative-style' Education Group Conference Meeting: Schools' Physics Group meeting delivers valuable teaching update Saturn Mission: PPARC's Saturn school resource goes online Funding: Grant scheme supports Einstein Year activities Meeting: Liverpool Teachers' Conference revives enthusiasm for physics Loan Scheme: Moon samples loaned to schools Awards: Schoolnet rewards good use of ICT in learning Funding: PPARC provides cash for science projects Workshop: Experts in physics education research share knowledge at international event Bulgaria: Transit of Venus comes to town Conference: CERN weekend provides lessons in particle physics Summer School: Teachers receive the summer-school treatment

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Brecon hosts ‘alternative-style’ Education Group Conference

‘An alternative style of Education Group Conference: forget the expensive, air-conditioned conference centres with tables of notepads, boiled sweets and fizzy water. If we really want to think radically about physics teaching and consider what we do (and why), hear about the latest ideas in physics teaching and curriculum development, or just network with other physics teachers, what better place than in the fresh Welsh air of Brecon? Some say that there is a positive correlation between a liking for hill walking and that of physics teaching. This hypothesis will be tested; but large group walks will not be mandatory!’

Or so the advert said. But what actually happened at the Education Group Conference 2004?

This year’s conference did take place in the small village of Erwood, some 13 miles north of Brecon. ‘Unusual’, some might say, ‘strange’, the good citizens of the village did say. But nevertheless, 30 or so physicists came, discussed, and left much enriched.

The local hospitality was faultless and the event was judged as ‘very good’ by its participants who came from far and wide. As well as UK delegates it attracted people from Austria and even Canada.

The conference began on the afternoon of Friday 28 May with an uplifting talk from Ken Zetie entitled: ‘The flight of the bumble bee’. He gave an excellent explanation of how the myth started that these creatures cannot fly, and how, in fact, they can. This was a timely talk considering that 2004 marks 100 years of powered flight and (less well known) 150 years since the first glider was flown by its inventor’s footman. George Caley had more sense than to fly the glider himself.

Malin Starrett gave a passionate and authoritative demonstration of Chladni’s plate. It was refreshing to see the look of awe on the faces of hardened physicists. Those amazing patterns appeared from nowhere and the plate sang out as Starrett placed his fingers on the plate and ran a violin bow down its edge. Even we amateurs were able to produce patterns under his expert tutelage.

After the tea break (which seems to mean tea, coffee, sandwiches and cake in Wales) we returned refreshed to an inspiring talk from Frank Banks of the Open University on flexibility in teacher training, describing his work to make entry to the teaching profession more accessible.

We then had a short break for

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 send your news items for the November issue of Physics Education to ped@iop.org before 15 September 2004.
delegates to attend to their accommodation, which comprised most of the local guest houses that were not booked by attendees of the Hay-on-Wye Literary Festival.

It was at this stage that I developed a feeling of unease. Our next speaker, Malcolm Cornwall, had not yet appeared, and with 20 minutes left before his scheduled start time I began to worry. He was not at home when I phoned (a good sign), nor did he answer his mobile (not so good). When I returned to the venue, there he was. It turned out he had been in Wales for a good few hours. However, an ingress of shampoo had rendered the buttons on his mobile phone inoperative: it rang but he could not answer it.

Cornwall gave an excellent talk on how the Global Positioning System (GPS) works. This was also the subject of a recent article in Physics Education (35 2000) 232–9. We even had gatecrashers for this talk as the partners of delegates demanded to be admitted. The talk prepared us for the next day’s trek up Pen-y-Fan, the highest peak in the south of the UK.

Saturday kicked off with a display of new and unusual teaching ideas courtesy of Tony Reeves (who also ran the Friday-night pub quiz) of Christ College, Brecon.

Later that day, delegates prepared themselves for an assault on Pen-y-Fan. A few of us were very suspicious when Cornwall loaned us his GPS unit, assuring us that all we had to do was follow the arrow on its screen; he had pre-programmed our route. Strangely, he was unable to join us because his car had ‘developed a fault’ and needed ‘garage attention’.

The push to the top
The ascent went well and most delegates even had breath enough to discuss physics as well as the weather. My earlier suspicions about the GPS were confirmed as we neared the summit and the device instructed us to walk a further 300 m over a sheer drop at the top. As the sky became black in the distance and the wind rose, we beat a hasty retreat from the summit, but the feared weather did not arrive. We returned to Erwood dry.

That afternoon Martin Hollins from the QCA told us about the current thinking for the new GCSE Programme of Study which will lead to new GCSEs in science in 2006. This was followed by a lively debate about these ideas.

Zbig Sobiesierski from Cardiff University entertained and educated us with his outreach talk on pub physics. This explained everyday applications of physics in a humorous and accessible way.

The conference dinner allowed plenty more time for networking, uninterrupted by speeches. By the time delegates had finished passing the port there was a general atmosphere of contentment.

The Sunday sessions began with talks on two new curriculum projects. First, Peter Campbell described the new GCSE science project – 21st Century Science – which is now in its pilot stage. This talk was supplemented by many samples of course materials and was followed by a constructive discussion of the project, its implementation and its future.

This was followed by an insight into the new AS-level in the history, philosophy and ethics of science called ‘perspectives on science’. This title was altered slightly by the developers as they were wary of the acronym for ‘perspectives in science’. Again, the talk was supported by sample materials and was discussed by the conference.

The AGM was – mercifully – untroubled by protracted debate, and after the new committee was elected, delegates left feeling both refreshed and tired after a weekend immersed in physics.

Did the conference succeed in its aim? Well, to paraphrase the Rt Hon. Francis Urquhart: ‘Some may say so, but I couldn’t possibly comment.’

Jason Wye
MEETING

Schools’ Physics Group meeting delivers valuable teaching update

The Annual Meeting of the Schools’ Physics Group in Rugby is well-established as a focal point of the Physics Education calendar. The meeting, which took place on 10 June at Rugby School, provided a mixture of erudition and exposition from planets to plastics.

Monica Grady’s ‘News from Mars’ gave an up-to-the-minute account of the images and associated data provided by the Spirit and Opportunity missions to Mars. Her talk included several spectacular images and reinforced her reputation as an excellent lecturer.

Derek Denby is science manager for the Teaching and Learning Project. He gave a presentation called ‘Improving teaching and learning in post-16 science’. He responded well to robust questioning and went some way to winning over what was, at times, a somewhat sceptical audience.

Gaynor Bradley chaired the excellent ‘News slot’. Peter Campbell highlighted www.practicalphysics.org for practical physics.

Following the usual excellent lunch, Jules Hoult, head of science at Felsted School, took centre stage. He gave a pilot school’s perspective of the 21st Century Science course in his unique no-holds-barred, warts-‘n’-all style. His commitment to good science teaching is an example to us all.

John Taylor gave an interesting presentation on the AS-level course perspectives on science (history and philosophy of science), in which he was at pains to point out the potential of the course to science and non-science students. He also highlighted that the AS-level was 100% teacher-assessed and board-moderated.

Averil MacDonald – known for her Fantastic Plastics Schools’ Lecture – is justifiably famous. We were given recipes for some of her most impressive exhibits including ‘slime’ and ‘potty putty’.

If you are involved in physics education and have yet to attend the Schools’ Physics Group meeting you really should give it a try. Next year’s meeting will be held on 9 June at Rugby School.

Tony Reeves

SATURN MISSION

PPARC’s Saturn school resource goes online

The Cassini–Huygens mission to Saturn reached its destination on 1 July after a seven-year journey through space, and now PPARC is pleased to announce that its Cassini–Huygens Schools Resource is available online (www.pparc.ac.uk/cassini).

This website contains images, information and activities based on the mission. These can be used online or downloaded as either Word or PDF files.

There are sections on the site suitable for age groups 7–11, 11–14, 14–16 and 16+. The resource is also available, free, on CD-ROM. A poster and a full-colour broadsheet about the mission can also be obtained, free, from PPARC. E-mail your order to pr.pus@pparc.ac.uk.

FUNDING

Grant scheme supports Einstein Year activities

Einstein Year is the UK and Ireland’s contribution to the International Year of Physics. It is a unique opportunity to enthuse young people about physics and to highlight the contribution of contemporary physics to society.

To make Einstein Year truly national, the Institute of Physics is encouraging individuals and organizations to run their own physics-based outreach activities in their communities during 2005.

To support these activities, the Institute is offering awards of up to £1500 through the Einstein Year Grant Scheme. Application forms and further information for the first round of the grant scheme are available at www.einsteinyear.org/get_involved/funding.

The closing date for first-round applications is 24 September. Priority will be given to activities taking place in the first half of 2005. The closing date for round two is 25 February 2005.

For further details on Einstein Year, e-mail Caitlin Watson (caitlin.watson@iop.org).
The 2004 Annual Liverpool Teachers’ Conference took place on 1 July at Liverpool University.

The conference began with an intriguing talk by John Fry entitled ‘Time reversal in the real world’. He covered a great deal of A-level particle physics and considered the effects on physical phenomena if time could be reversed. Fry also explained the circumstances in which time might run backwards in a world made of antimatter.

Fry was persuaded to join the question-and-answer panel later that day so that his mind-bending ideas could be explored further. This is always a popular session where experts in a range of fields answer questions from the floor.

We were delighted that the winners of the Merseyside/Manchester Paperclip Physics heat beat off the competition to win the national final. Peter Illingworth and the champions from King’s School Macclesfield gave an enthusiastic account of their experiences.

The King’s School team presented their brilliant demonstration. It was noticeable that the team’s confidence had increased since the regional event.

Andrew Newsam reported that the Liverpool Telescope had received ‘first light’. Located on the island of La Palma in the Canary Islands, this telescope has a 2 m diameter mirror and is robotically controlled. Observing time on this research instrument has been allocated for UK school use (tele
coscope.livjm.ac.uk/; www.schools
observatory.org.uk/newuser.htm).

Lunch was a busy time because the Sun shone, enabling sunspots to be viewed through the solar telescope. There was also an exhibition of experiments provided by Leybold Didactic, and an SPT 11–14 pilot CD was loaded on several PCs for teachers to try.

Chris Messenger of St John Almond’s High School, Liverpool, ran a hands-on workshop of physics software. Teachers were reluctant to leave his workshop because of the amount of excellent material he was demonstrating.

David Smith and David Richardson provided some stunning demonstrations gleaned from Physics Education. This session was rated by attendees as the most valuable part of the day and was described as ‘inspiring’.

The conference finished with a talk by Peter Rowlands who looked at A-level topics from a historical viewpoint. The ‘hidden depths’ that he found can be explored on the Web at www.
liv.ac.uk/~iop/PTC2004/Hidden
Depths.ppt. This will supply historical snippets to slot into lessons.

More than half of delegates had attended the conference in previous years. The feedback on the 2004 conference showed that the Teachers’ Network had been successful in attracting new registrations, many from further afield.

The programme is available to download at www.liv.ac.uk/~iop/PTC2004/PTCprog.pdf.

Last year there was an excellent overview of the techniques of medical imaging by Peter Cole. This is now available to download from www.liv.ac.uk/~iop/PTC
If you are thinking that the event had concentrated on the senior end of the curriculum, this is because this year the Merseyside Teachers’ Network had arranged a Conference on 15 June covering KS3 and 4 to which non-specialists teachers of physics and PGCE students were invited.

The programme (see www.amarks.co.uk/mptn/conference1.pdf) included Concept Cartoons, SPT 11–14, datalogging workshops, Science Learning Centres, and fun with liquid nitrogen. The feedback indicated that a similar meeting should be arranged for 2005. The opportunity for networking was valued highly and I’m sure that the demonstrations from Physics on Stage will be brought into numerous lessons (education.iop.org/Schools/support/PoS3demos.html).

Thanks to Liverpool University’s department of physics as well as to all whose efforts made these events so enjoyable: the organizers, the speakers and, most importantly, the teachers. The attendance at the two meetings topped 140 and the infectious enthusiasm of the teachers is convincing evidence that physics is very much alive and thriving on Merseyside.

Ann Marks, Merseyside network coordinator and branch chair

**L O A N S C H E M E**

**Moon samples loaned to schools**

Wouldn’t it be great to be able to bring an artifact from space into your classroom? PPARC’s free loan scheme for moondust and meteorites can help you.

PPARC lunar samples packages contain a variety of soil samples from the Moon brought back by Apollo astronauts. They also contain a selection of meteorites – provided by the Natural History Museum – that can be handled.

The packages come with teaching notes and materials suitable for ages 7 to adult. Already these packages have been used by schools all over the UK.

See www.pparc.ac.uk/Ed/LS/moon.asp for information about the scheme. You can book the samples up to a year in advance from Jane Butt at PPARC (e-mail jane.butt@pparc.ac.uk or telephone 01793 442030).

**Reach for the Moon: PPARC’s free lunar samples can help.**

**A W A R D S**

**Schoolnet rewards good use of ICT in learning**

European Schoolnet is currently organizing its fourth annual eLearning Awards event.

The aim is to showcase the best examples of the use of ICT by teachers in schools and to reward the best projects with cash prizes for their schools. Although there are usually 600–900 submissions per year, the UK has unfortunately tended to be under-represented. In 2003 there were just nine UK submissions. It is now too late to enter this year’s event, but why not plan to enter next year?

For more details, see elearningawards.eun.org.

Alan C Pickwick

**F U N D I N G**

**PPARC provides cash for science projects**

PPARC has set a closing date of 10 October for applications for its Small Awards Scheme.

Awards of £500–10 000 per project will be made. The money can go towards materials, salaries, travel and subsistence.

The scheme encourages applications from projects involving young people and schools. Projects must be relevant to the promotion or teaching of PPARC-funded science areas: particle physics; space, ionospheric, solar and planetary science; astronomy; astrophysics; and cosmology.

Application forms and examples of previous winners can be found at www.pparc.ac.uk/Rs/Fs/Pu/funds.asp.

To apply for an award, contact Science & Society, PPARC, Polaris House, North Star Avenue, Swindon SN2 1SZ. E-mail: malcolm.booy@pparc.ac.uk.

Andrew Morrison
Every year during the last weekend in May the concentration of physics teachers at the Faculty of Physical and Mathematical Sciences, Benemerita Universidad Autonoma de Puebla, Puebla, Mexico, increases sharply. The reason for this is that Puebla hosts the international workshop New Trends in Physics Teaching. The event is now in its 12th year.

Each year the workshop attracts about 80 high-school and university physics teachers from all over Latin America. The main objectives of the event are to promote the application of physics education research results in the design and implementation of physics courses, and to create opportunities for an exchange of experiences between physics teachers.

About 10 lecturers, selected from recognized experts in the field of physics education research and well-known physics teachers, are invited to speak at the event. This year, the list included Manuel Fernández González (University of Granada, Spain), Andy Johnson (Black Hills State University, USA), Harol Hoffman and Gerald W Meisner (University of North Carolina, USA), Gorazd Planinšič (University of Ljubljana, Slovenia), David E Meltzer (Iowa State University, USA), Adrián Corona Cruz (Autonomous University of Puebla, Mexico), Dewey I Dykstra (Boise State University, USA), Salvador Jara Guerrero (University of San Nicolas, Mexico) and Josip Slisko (Autonomous University of Puebla).

Discussion points

The different aspects of the use of technology in physics learning was one of the topics for discussion. Andy Johnson spoke about how adequate computer software can help students to better develop their conceptual models.

Hoffman and Meisner showed how it is possible to build a virtual lab based on constructivist pedagogy. Meltzer gave an overview of the status of physics education research in the US and presented strategies and trends in achieving active learning in large classes. Slisko pointed out the persistence and propagation of misinterpreted physics concepts in textbooks. Planinšič discussed a number of original experiments and demonstrated how to use them to achieve active learning.

After a Saturday night poster session in which delegates shared their teaching ideas, there was a party. Moved by Mexican snacks and songs, many lecturers and teachers revealed their musical and dancing talents. The greatest star was Meltzer who is able to sing – with an incredible accent – more than 100 national anthems!
The transit of Venus on 8 June became a day of national celebration of science for students and teachers from all over Bulgaria. This astronomical phenomenon brought more than 10 000 young people from many cities to public astronomical observatories and observation areas at schools.

Preparations for the event started at the beginning of the year. Educational material from the EAAE and ESO had been translated and sent to more than 200 pre-registered observation teams.

Most of the teams were teachers and students who were studying the physical characteristics and motion of planets. They were introduced to methods for calculating the astronomical unit, and they studied the historical background to the transit of Venus.

In the preparatory stage, specialized sessions were extremely useful for teachers and students, familiarizing them with observation equipment and providing a good scientific, educational and technical preparation for the transit observations.

The Festival of Physics and Astronomy took place in Varna two days before the transit of Venus, with more than 2000 students exhibiting their equipment, models and projects.

The day of the transit of Venus turned into an astronomical celebration. School timetables were changed so that teams of teachers and students could watch the event. They determined the moment of contact, made drawings, took photographs and videoed the event. In school play-

**Bulgaria**

Transit of Venus comes to town

The Festival of Physics and Astronomy took place in Varna on 6 June with more than 2000 students exhibiting their projects.

The transit of Venus drew more than 10 000 people from cities all over Bulgaria to public astronomical observatories.
What can give you a real boost as a physics teacher? For me it has been attending the conference PhysicsTeachers@CERN2004.

Over the weekend of 30 April – 2 May, 24 teachers from the UK and 24 teachers from other countries in Europe gathered at CERN to learn about the work carried out there and to increase their understanding of particle physics.

A friend who had attended this conference in 2003 told me that applications were being accepted for PhysicsTeachers@CERN2004 early in the New Year. His enthusiasm and description about what he’d seen and done (including the ‘Heidi dancing’) last year, stirred me to apply.

I only just managed to get my Internet application in on time and I was very excited when I found out that I’d gained a place. Over the weeks leading up to the conference, I received e-mails from Andrew Morrison, the PPARC schools liaison officer, and Antonella Del Rosso, an education officer at CERN, that built up the excitement and anticipation.

The conference consisted of two and a half days of talks, visits and social events. It started with a general introduction to CERN: its activities and its unique position on the French–Swiss border. We were informed that it has its own fire brigade and internal security service, and employs some 9000 people from the surrounding area. CERN has 20 Member States.

School timetables were changed so that teams of teachers and students could observe the transit of Venus.

Andrew Shipley is dwarfed by part of the high-performance general-purpose CMS detector.

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**Conference**

**CERN weekend provides lessons in particle physics**

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but it soon became evident that there are strong international links, with at least 6500 scientists worldwide contributing to its activities. There are four major spin-offs from the work carried out at CERN: progress in particle physics; helping to develop tomorrow’s technology; training tomorrow’s scientists and engineers; and informing and stimulating interest in science and technology.

A highlight of the weekend was being able to see a number of different sites around the Large Hadron Collider (LHC). At these sites, particle detectors with names such as ATLAS, ALICE and CMS are being constructed.

The scale on which everything is being built is difficult to comprehend: the LHC being a 27 km long underground accelerator ring. The detector chambers were like modern-day cathedrals being built to house detectors that dwarfed us as we walked round them.

These different detectors are looking to advance man’s understanding of matter, antimatter and dark matter and searching for the long elusive Higgs particle, among other things.

Was the conference a worthwhile experience? Absolutely. Would I do it again if I could? Yes, most definitely.

For information about future teacher events at CERN, please see visitservice.web.cern.ch/VisitsService/education/teachers.html or contact Andrew Morrison (e-mail: morrison@innotts.co.uk).

Andrew Shipley