

NEWSLETTER

March 2009

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**Check
out your
branch
website**

**[http://
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Bright sparks enjoy club



Electronics club members (left to right) Ryan, Thomas and Karl show circuits that they built, after a club meeting at the Cambridge Ultrasonics workshop in which they learned about audio amplifiers.

The East Anglia Branch of the Institute of Physics is helping to support young people learning about electronics and physics in a village near Cambridge. An electronics club was formed several years ago by Institute member Dr David Andrews, and it meets in the workshop of Cambridge Ultrasonics on Saturdays. Some of the circuits built by the young club members include crawling robots, sirens, roulette games, radios, torches and stroboscopes. All club members make and present kitchen timers to their mothers as Christmas presents at least once during their membership.

Typical club activities include learning how to solder, learning

how to use an oscilloscope, dismantling personal computers and the advantages of keeping the internal parts clean, testing Ohm's law on resistors (the resistors are tested to destruction), generating radio waves and detecting them, building an electronic cannon, looking at ultrasonic waves in water and experimenting with an electronic bat. Previous club members have taken GCSEs in physics, mathematics and chemistry. Most have gone on to study physics and mathematics at A-level, and about 50% studied electronics at A-level.

Dr Andrews has had a life-long interest in electronics and studied physics and

mathematics at the universities of Bristol and Cambridge, as well as working for BP and Oxford Instruments before founding Cambridge Ultrasonics in 1987. He is currently a Science Ambassador under the STEMnet scheme and has been active in promoting physics, mathematics and STEM for several years in the Cambridge area. He has demonstrated ultrasonic experiments at several schools in Cambridgeshire, at Duxford, at Physics at Work at the Cavendish Laboratory and as Christmas lecturer for the Institute of Physics at its inaugural Christmas event in 2000, also at the Cavendish Laboratory.



Bublzl the Maths Clown helps a participant to make a pitch.

STEM workshops pass on key skills

On 15 January our regional officer, Esther Haines, attended the Science, Technology, Engineering and Mathematics (STEM) Enrichment and Enhancement Event at BT Adastral Park, run by STEMNet, East of England. The day included lectures about science outreach to schools, followed by workshops that gave the participants a chance to learn more about networking skills, and to practise their outreach and networking skills.

Some of the workshops included “Using social networking sites”; “The National Centre for Excellence in Teaching of Mathematics (NCETM)”;

the Advancement of Science CREST Awards (CREativity in Science and Technology Awards); “Robotics”; “BT showcase technology”; “The Science Learning Centre, East of England”; “What’s new in education”; and “Science museum outreach”. I am sure that the information and skills that Esther brought back will be extremely useful to the branch in the future.

- Bublzl the Maths Clown does maths workshops with primary, secondary and further education students as well as corporate team-building events. To contact her and for more information, visit www.bublzlthec clown.co.uk.

Network enriches science in school

STEMNet (Science, Technology, Engineering and Mathematics Network) aims to ensure that more young people in the UK enter science, technology, engineering and mathematics (STEM) related careers at all levels, and future generations are properly informed about the science and technology that surrounds them.

With the support of its partners, STEMNet achieves this in two ways:

- by bringing science, technology, engineering and mathematics activities, experiences and excitement into classrooms throughout the UK, enhancing and enriching the national STEM curriculum;
- by linking the companies and organisations that employ STEM-educated people and schools, so that young people can get a clear idea of the diverse and exciting range of careers available to them.

STEMNet works through local partnerships. For Suffolk, the Suffolk Education Business Partnership was recently awarded the STEMPOINT and Science and Engineering Ambassadors (SEAs) contracts. This means that they will provide schools and colleges with impartial advice and guidance on a range of STEM enhancement and enrichment activities, helping them to identify which opportunities can best inspire their young people in STEM. This includes advice on activities listed in nationally recognised STEM directories as well as other regional and local provision.

(STEM directories can

be downloaded from www.suffolkebp.co.uk/downloads.)

The SEAs contract ensures that all schools and colleges have access to a range of exciting and dynamic individuals who can act as role models in STEM. SEAs are people who are willing to give their time and energy free of charge to help to inspire young people in STEM – they can do this in a variety of ways, from illustrating specific careers or helping with classroom activities to assisting in extra-curricular activities.

SEAs could be involved in a range of activities, including:

- supporting schools activities (e.g. clubs and competitions);
- offering mentoring, careers guidance and role models;
- assisting with project-working in the classroom;
- providing work-based placements for teachers and young people.

If you are a school and want to know more about STEM enhancement and enrichment activities or are planning activities that SEAs could help you with, or if you are an employer or employee who would like to support schools to develop their STEM curriculum, contact Ann Cloke (tel 07768 903 392, e-mail ann.cloke@suffolkebp.co.uk).

Schools based in Norfolk should get in touch with Stuart Catchpole (e-mail seas@norfolknetwork.com).

In Cambridgeshire, contact Elizabeth Crilly (e-mail seas@stemteamcambridgeshire.org.uk), and in Essex, contact Mike Williamson (e-mail seas@stemteamsex.org.uk).

Science film competition enters its second year and gains in popularity

SciCast Physics is a science competition for students in years 10–12. Budding directors are invited to make a video of themselves demonstrating or explaining a principle of physics. These short films are judged on how well the students explain the principle in question. The

winning entries are then posted on the internet.

This is SciCast Physics’ second year, and it seems to be gaining in popularity. Nationwide there were about 104 entries, which is double the number of films that were submitted last year. SciCast as a

whole has received 170 films (65 from the London and South-East Branch and three from the East Anglia Branch), and it appears that the participating students are more interested in physics than in chemistry, biology, engineering or Earth sciences – at least at A-level.

Judging took place on 16 February (after the deadline for this newsletter). I will try to include information about the winners in the next issue.

If you are interested in seeing the winning SciCast Physics films, visit www.planet-scicast.com/films.cfm.

Awe-struck students say that physics rocks

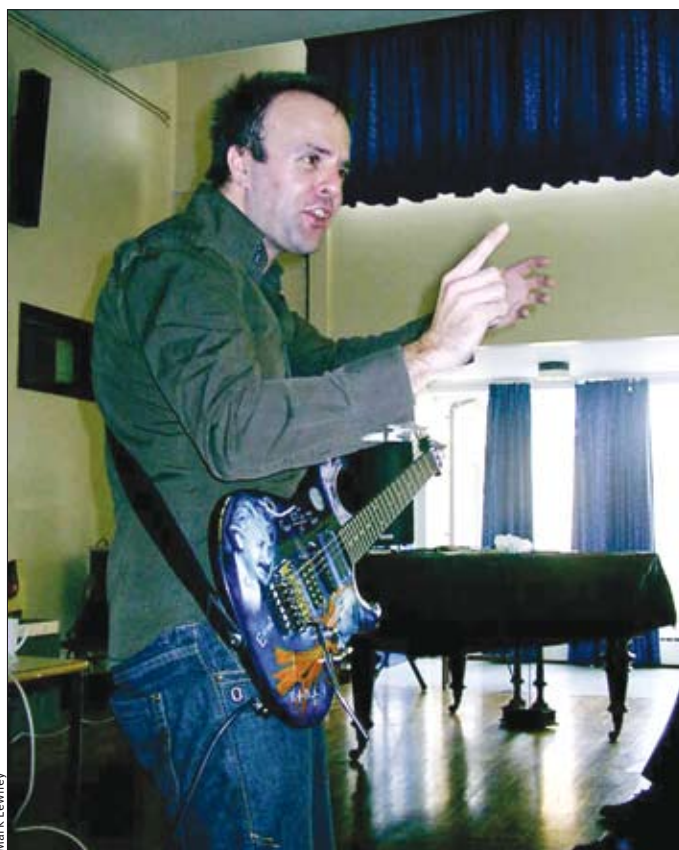
On 21 November 2008 Mark Lewney gave his talk entitled "Rock guitar in 11 dimensions" to two very different audiences.

In the afternoon, Mark strutted his stuff at East Bergholt High School. It was clearly a huge success with comments such as:

- "We thought it was really good. We love Dr Lewney."
- "I definitely look at physics differently now."
- "The students were in awe and completely focused – a rare event."
- "Dr Lewney was awesome."
- "It gave physics another side that I never knew it had."
- "The talk was brilliant."

Although following his standard lecture format, this event was outside the normal Institute of Physics Schools Lecture programme, and was organised separately by Paul Nicholas, who is our collaboration contact in the Suffolk Education Business Partnership. In his view, this performance exceeded all of his objectives, with formal feedback responses indicating that 92% of attendees would now be considering higher/further education in science, and 68% saying that they would be considering a career in science. This is one of the most positive results seen by Paul to date.

In the evening, Mark went on to deliver his second performance. This time he departed from his usual brief and gave his all to the families and members of the East Anglia region of the Institute of Telecommunications



Dr Lewney creates a big bang with students at East Bergholt High.

Professionals. This institute is our other principal collaboration partner in the Ipswich area.

It almost goes without saying that this audience was bowled over by Mark's lecture, where he introduced his audience to the physics of vibrations, string theory and everything from nano-size to several-universes-large, ending with a space-time visualisation of the universe and the exciting opportunities about to be unfolded by the Large

Hadron Collider in Geneva, and the answer was neither 42 nor the end of the world – but it might herald the end of physics as we know it.

Mark's visit was a resounding success. He is an excellent ambassador for physics in general, and he has helped us to forge some meaningful relationships with other science/technology-oriented organisations.

Paul Millar

Institute offers careers support

We are all tempted to ask sometimes: "What do I get for my membership fee, other than *Physics World* and the occasional inserts, such as the *EAB Newsletter*, that come with it?" Well, one of the services that the Institute provides is career assistance. Much of the guidance is web-based (visit www.iop.org/activity/careers/Careers_University_and_Beyond/Resources/Career_resources/page_3964.html), but, if you visit Institute headquarters at 76 Portland Place, you can borrow or take away the literature, obtain expert help to track down other information, use the IT resources, reserve a place on workshops/seminars, book an appointment to see the careers adviser or book a mock interview. You can also get guidance on further study and funding, work experience, job market and assessment centre information, specific occupational queries, application forms and CVs.

On the web there is information about jobs (how to apply, where to look and what to do) and mentoring (guidance on how to establish a mentoring partnership). You will also find *New Directions*, a booklet with profiles of physicists who have made one or more career transitions. The booklet contains useful tips and advice on how to successfully change careers. You can download a copy directly from the website or contact the careers service (e-mail members.careers@iop.org), quoting your Institute membership number.

On the webpage listed above, you can also find the "Physicists' Guides" to raising your profile, application forms, assessment centres, changing your career, writing your CV, getting the most from a physics degree, interview techniques and choosing a PhD.

If you are thinking of changing job or career, or just want to brush up your CV, check out the Careers Service, whether in person, on the internet or by e-mail. I have found it to be very useful.

The deadline for contributions to the next issue of this newsletter Friday 27 March

E-mail material to jeannette.fine@finerandd.com

Physics Communicators Group kicks off with interim committee

As many of you may already know, a new Institute group is being created. It is called the Institute of Physics Physics Communicators Group, with the aim of bringing together Institute members who are interested in promoting physics to the general public. One of its key objectives will be to support members who are undertaking outreach and physics communication activities.

During its creation phase, the group is being chaired by Prof. Averil Macdonald (e-mail a.m.macdonald@reading.ac.uk). An inaugural meeting was held at Portland Place on 30 January, during which an interim committee was nominated to set the group up and undertake the tasks required to bring the group to life. In due course, there will be a formal meeting of all registered group members to agree on aims and terms of



The interim committee for new Institute of Physics Physics Communicators Group. Back row from the left: Keith Williams, Bob Boutland, Martyn Bull (interim secretary), Francisca Wheeler, Alun Vaughan (interim treasurer), Bob Fairbrother. Front row from the left: Paul Millar, Averil Macdonald (interim chair), Lara Grant.

reference and to elect a full business committee. We have a working assumption that

the group will be principally involved in identifying and sharing best practice among

the community of physics communicators, with a view to publicising the excitement of physics and raising awareness of the benefits of physics to society as a whole.

If you would like to join the group, log on to *MyIOP* (<http://my.iop.org>) and navigate to the relevant network for the group (it's currently towards the end of the list of networks) then select "Sign up for this network". Alternatively, you can contact the membership department. All groups are free to join. However, to join a group you must first be a member of the Institute of Physics.

Paul Millar

● Paul Millar, from the East Anglia Branch, is one of the interim committee members, and he will be happy to take advice from branch members on thoughts relating to direction and scope for this new group.

Workshops set to help non-specialist teachers

Over the next four months the Cavendish outreach department is offering three one-day workshops for physics teachers. The workshops will follow the same format, but each will cover a different area of physics within the national curriculum. These workshops are designed to support teachers of physics at KS3–5, in particular those who are non-specialists in the field.

Each schools workshop will include a subject review session, curriculum discussion, lunch with current Cavendish students and researchers, a practical session and a research-based lecture.

A total of 30 free places are available to any physics teachers and, while the days are aimed at non-specialists, we appreciate the attendance and input of experienced physics teachers in the discussions and hope that they may also

benefit. The workshops are all from 9.00 a.m. to 4.00 p.m. in the Cavendish Laboratory. Booking is required. The workshops are "Waves and optics" (http://www-outreach.phy.cam.ac.uk/TeachWork/Waves_Optics_09/programme.php), Wednesday 25 March; "Light" (<http://www-outreach.phy.cam.ac.uk/workshop/>), Thursday 2 April; and "Radioactivity and the atom" (http://www-outreach.phy.cam.ac.uk/TeachWork/Radio_09/programme.php), Wednesday 17 June.

These are not the only schools workshops in 2009. There will be one in December, "Atoms, elements and crystals" (<http://www-outreach.phy.cam.ac.uk/workshop/>), although this cannot be booked yet.

For more information, contact Lisa Jardine-Wright (tel 01223 333318, e-mail outreach@phy.cam.ac.uk).

Festival of fun and learning for all

This year's Cambridge Science Festival, entitled "Centuries of Science" will be on 9–22 March.

Some 40 university departments and many partner organisations in business and the community put on events for the public during the festival, and 1000 staff, students, businesses and community volunteers take part each year. Before each festival the Annual Schools Roadshow involves 15 university lecturers visiting 30 local schools to give special talks tailored to the national curriculum. Demand for roadshow lectures considerably exceeds supply. You do not have to be a university lecturer to offer a talk. If you would like to participate in 2010, contact Esther Haines (e-mail esther.haines@iop.org, tel 07919 035851).

On Saturday 14 March, the biology, chemistry and engineering departments will have their open days. These are all good value, so head into the centre of Cambridge for an

afternoon of fun (and perhaps even some learning).

The Cavendish Laboratory open day will be on the last Saturday of the Science Festival on 21 March, 2.00–5.00 p.m. It will include a lecture by Arthur Wolstenholme, lots of things to see and do, including something new to make and take home, and the planetarium. Come and join the fun and share the excitement at the Cavendish Laboratory.

If you have any energy left after the Cavendish open day, the astronomy department and the vet school will also have their open days on 21 March. The astronomy department puts on a good show (although its telescopes won't show much at that time of day), and I have heard that the vet school is well worth a visit, so round out the day with visits to both.

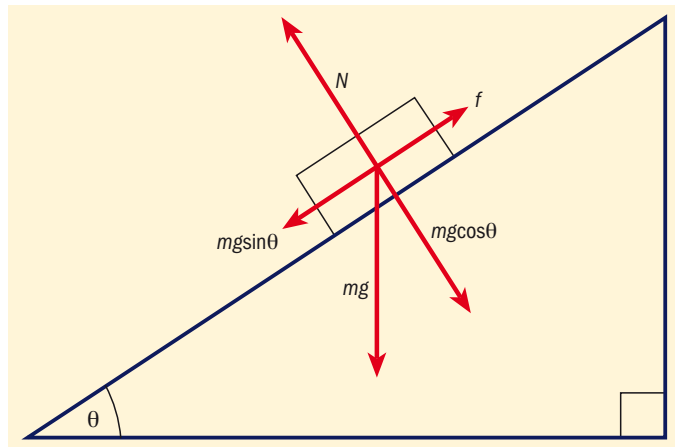
There will be lots more going on, both at the weekends and during the week, so visit www.admin.cam.ac.uk/offices/communications/community/science for more information.

Physicists or engineers: discuss

On 4 February, John Clark of Fine R and D Ltd answered the question “What on Earth do engineering firms need a physicist for?” for a small but enthusiastic audience at the University of East Anglia.

He first gave a potted history of trends in industrial R&D, showing why R&D has moved from corporate labs such as those at 3M or IBM to small start-ups funded by venture capitalists. Large firms can afford large R&D projects, although the development of jet engines was too big even for large aircraft firms and was partly funded by governments’ defence budgets. However, R&D projects (in these firms’ eyes) have several problems: low return on capital, long timescales (longer than the tenure of many chief executives – development of aluminium car bodies at Dr Clark’s then employer started in the mid-1980s and was not commercialised until 2002), and extreme unpredictability. Therefore, any time that a firm has a problem or even changes chief executive, R&D is often the first budget to be cut, whereupon R&D projects get an even worse reputation than they certainly deserve.

This meant that, by the 1960s in the USA and the 1980s in the UK, R&D was beginning to move to small start-ups funded by venture capitalists. Here, the time scales are still short (about 10 years), but the funders are more tolerant of failure – venture capitalists “spread their bets”, expecting that of every 10 start-ups that they fund, four or five will fail, three or four will barely cover their costs, and one or two will be successful. If the venture capitalist is careful, his return on investment will be about the same as if he invested in the stock market. Therefore, Dr Clark suggested that a new graduate wanting to do research in industry should move to a “hot spot” for start-ups, such



This is an example of a physical phenomenon that John Clark was once able to apply to a problem that engineers and industrial designers in the R&D department could not solve. The question was whether a gear mechanism would slide, and hence work, or stick, and hence jam. The criterion for a block on an inclined plane (or one gear tooth against another) to slide is, of course, $\tan \theta \geq \mu$, where μ is the friction coefficient, assumed constant.

as Cambridge or Dublin (Boston or Silicon Valley in the US), get a job in a start-up and move on when it fails or is bought out.

Dr Clark then went on to cover two examples of what physicists can offer to new product development. In the first case, a pharmaceuticals firm wanted to add a dose counter to an asthma inhaler. A dose counter must have the following properties: it must always count; it must never over- or under-count; it must never count backwards, and it must not ever jam. It must fulfil these criteria in spite of manufacturing tolerances, which, in the case of small parts, may be a significant fraction of the size of the part. One of the big problems was jamming, and here the engineers and designers on the project came unstuck. They could not work out whether or not the mechanism that the industrial designer created would jam. About a week’s work by Dr Clark, first with pencil and paper, then with a technique called finite element analysis (FEA), gave angles for the gear teeth such that the teeth would always slip against each other. The first

prototype of the mechanism worked, and worked well. It was still working reliably years later. Another company, which went straight from design to prototype without this check, needed several prototypes – each taking about three months – before they got one to work.

A physicist’s intervention was needed once more on this project – if the device was dropped, the lid came off, which was unacceptable. Photography at 1000 frames per second was too slow to identify the detachment mechanism – in one frame, the lid was on, in the next it was off. So once more it was physics to the rescue, again with FEA. Modelling the drop in a computer showed why the lid came off. Further modelling showed how to fix this.

In another project, the question was where to put large moulding machines in a cleanroom: entirely in it; entirely out of it; or half in, half out. The problem was that these machines generate large amounts of heat, and the temperature of the cleanroom must be kept constant. The worry was that, if the machines

were entirely inside the cleanroom, the cost of keeping the cleanroom cool would be prohibitive. Having them either outside or half in half out avoided the cooling problem, but meant that, every time that the cleanroom layout was changed, it would cost more than £100 000 to move the walls through which the moulding machines protruded.

A computer program was written, using no more physics than the heat transfer learned in first-year undergraduate physics courses. This included convection and conduction of heat (radiation was small enough to be ignored). It also included physical properties for all of the plastics likely to be used in the factory, and for the types of moulding machines likely to be used. The size and shape of the factory and the number of moulding machines could be varied. This program took about six weeks to write, but it saved the company tens of thousands of pounds.

Previously they had gone to outside consultants. Each proposed factory set-up would require a new contract with the consultants. Dr Clark concluded by saying that manufacturing firms typically needed many engineers, but only a few physicists. The engineers have large amounts of qualitative and practical knowledge – the example he gave was knowing where to source a motor capable of lifting a 2 tonne lid upwards by 2 m. Physicists, on the other hand, bring understanding of the underlying principles.

This lecture was part of a series of talks organised by COPHIS (the Centre of Physics in Science) at the UEA. The next one, “Antimatter” by Dr Dirk Peter van der Werf from Swansea University, will be on 2 April at the UEA. For more information, contact Dr Martin Loftus (tel (0) 1603 456 161, fax (0) 1603 458 553, e-mail cophis@uea.ac.uk).

Got an idea for the newsletter? E-mail jeannette.fine@finerandd.com

Stellar lecture tour sets its sights on schools and colleges in 2009

The Schools and Colleges Lecture has been delivered by a series of acclaimed physics communicators since 1993. These people visit schools and colleges throughout the UK with a free interactive lecture designed to show school pupils, aged 14–16, contemporary developments in physics in a fun and lively way.

To mark the International Year of Astronomy, the Institute's 2009 Schools Lecture is to be given by astronomer Dr Andrew Newsam, a researcher at Liverpool's John Moore's University.

He will explain to students how telescopes have revealed the true age of the universe (14 000 million years), how we have predicted the Sun's life expectancy (another 5000 million years) and how we know that there are 200 000 million stars in our galaxy.

As Dr Newsam explains: "Astronomy is different from the other sciences in that we can't gather materials to assess them in the lab, we can only observe and it is our observations that allow us to surmise things about the true nature of our universe." Today's telescopes allow us to gather sharper images of more



Dr Newsam looks forward to sharing his passion for astrophysics with schoolchildren during International Year of Astronomy 2009.

distant and smaller objects.

Dr Newsam continued: "Telescopes are allowing us to find amazingly small objects existing at great distances from Earth. Take neutron stars, which are tiny but also fascinatingly dense – a neutron star the size

of a matchbox has the same mass as the whole of the Earth. How do we know that?"

Telescopes also enable time travel, allowing us to see the universe as it was hundreds of millions of years in the past.

Telescopes have also

developed to allow astronomers to explore the universe through a range of different mediums – telescopes that search out radio waves, microwaves, infrared, ultraviolet, X-rays and gamma rays, along with visible light.

Dr Newsam's lecture intends to inspire students into thinking more about how we know what we do about our universe and will engage students through fascinating facts and methods of observation along with some hands-on activities, giving students the opportunity to hunt for asteroids, to identify planets orbiting distant stars and to spot supernovae (massive exploding stars) in other galaxies.

Dr Newsam explained his enthusiasm for teaming up with the Institute for the 2009 Schools Lecture: "My work with schools grows from my view of science. Basically, if you aren't communicating what you do, you aren't doing science – the sharing of knowledge is integral to the whole thing."

For more information about the schools that Dr Newsam will be visiting, contact the press officer, Joe Winters (tel 020 7470 4815/07946 321473, e-mail joseph.winters@iop.org).

Event has brains, bangs and brawn

The annual East Anglia Branch December Event took place on the 14 December 2008. Despite the darkening skies and intermittent drops of rain, more than 300 members of the public came along, early on a Sunday afternoon, to one of the most active and well attended December Events ever.

David Ansell packed 30 experiments into his 65 minute lecture. Despite the flames, explosions and flying objects, no one was injured. However, several crisp packets and a few experimental samples were severely damaged to the delight of the onlookers. David's

book, *Crisp Packet Fireworks*, contains most of these experiments and is a worthy addition to the resurgent market in books on popular science.

Members of Imperial College London brought a high-tech feel, using microsensors to examine the physical fitness of attendees as they worked out on an Ergo (a machine used for training by rowers). Pulses raced and sweat decked foreheads in the almost non-stop efforts to row the (imaginary) boat at top speed.

This was swiftly followed by "A question of physical activity" – a panel game involving members of the public pitting their scientific judgment against the 75% dubious explanations proffered by physics professors, industrial consultants and

research directors. The audience won a convincing victory. This proves one of two things, that physicists are unconvincing liars or scientific knowledge among the general public is more in-depth than credited.

For the younger members there was a balloon-powered dragster to make and take home, and CHaOS performed to its usual high standards of practical demonstrations of scientific principles.

For the wider-ranging mind, the universe was explored with the planetarium.

The most satisfying results of the quiz showed that 95% of the general public could correctly attribute the statement:

"God does not play dice with the universe" to the correct

person from a list of Galileo, Einstein and Dawkins, and to the corresponding theory from a list of quantum mechanics, relativity and evolution.

The feedback was universally positive and many people were keen to know when the 2009 December Event is planned.

Thanks to Prof. Peter Littlewood, Dr James Crilly, Dr Jeannette Fine, Dr John Clark, David Ansell of the Naked Scientists, Rosy Hunt, Dr Jane Blunt, Dr Andrew Clarke, Dr Seiglinde Pfeandler, David Dyson, Harry Druiff, Helen Marshall, Martin Underwood, David Rutherham and many others including the CHaOS crowd and the queue-busting students of the Cavendish Laboratory.

Driving force for green machines

There is one lecture left in the 2008/2009 Cambridge Physics Centre lecture series. At 6.00 p.m. on Thursday 19 March, "A flash of lightning in creating the most exciting electric sports car on the planet" will be presented by Arthur Wolstenholme of the Lightning Car Company.

With the price of oil fluctuating, and with growing concerns about climate change, the rush to produce the first generation of viable modern-day electric cars has suddenly heated up.

With virtually no polluting emissions, energy-efficient electric cars use clean technology and have the ultimate green rating.

The Lightning Car Company has been at the forefront of

electric car development and their first electric sports GT car has just been released.

Arthur Wolstenholme has been in the automotive business since 1984 and he designed and manufactured the first Lightning supercar, which made its debut in 1999. He also designed two Vanwall cars, one of which was the GPR V12 featured on *Top Gear*, driven by Richard Hammond. You too can drive this car – on the Xbox 360.

The lecture will be in the Pippard Lecture Theatre of the Cavendish Laboratory. No booking is required. For more information, visit www.outreach.phy.cam.ac.uk/cpc/, or contact Lisa Jardine-Wright (tel 01223 333 318, e-mail outreach@phy.cam.ac.uk).

Look out for events at Cambridge University

There is a lot going on at the University of Cambridge that we have only space to mention in passing. Below are 11 events that will be of interest to many, with links to fuller information, including:

- a new doctorate in nanoscience: <http://www.admin.cam.ac.uk/news/dp/2008120503>;
- a new centre for the physics of medicine: <http://www.admin.cam.ac.uk/news/dp/2008121501>;
- a collaboration between physics and biology: iridescence and bees: <http://www.admin.cam.ac.uk/news/dp/2008122305>;
- Cambridge is tops for technology transfer: <http://www.admin.cam.ac.uk/news/dp/2008120801>;
- the UK Innovation Research Centre: <http://www.admin.cam.ac.uk/news/dp/2008120803>;
- development for entrepreneurship: <http://www.admin.cam.ac.uk/news/dp/2008111104>;

www.admin.cam.ac.uk/news/dp/2008111104;

- risky decision making and entrepreneurialism: <http://www.admin.cam.ac.uk/news/dp/200811202> and <http://www.admin.cam.ac.uk/news/dp/2008112501>;
- *Research Horizons* (the Cambridge University magazine covering recent discoveries and innovations) is now online: <http://www.admin.cam.ac.uk/news/dp/2008112804>;
- a Cambridge astronomer has been named Woman of Outstanding Achievement in science, engineering and technology: <http://www.admin.cam.ac.uk/news/dp/2008121901>;
- a Cambridge physicist wins a top award: <http://www.admin.cam.ac.uk/news/dp/2008111705>;
- the University of Cambridge is celebrating its 800th anniversary: <http://www.800.cam.ac.uk/>.

Students urged to rise to the physics challenge

The annual Cambridge Physics Department Senior Physics Challenge (SPC) will take place from 28 June to 2 July at the Cavendish Laboratory.

This is a university access initiative directed at AS physics students (or equivalent) in schools across the UK. This summer school aims to demystify the transition to university physics in the UK and to make it more accessible to a wider range of students.

Among many activities during the five-day event, students will participate in:

- general physics/research lectures;

- practical lab classes;
- evening entertainment (physics estimation);
- admissions talks.

Students will be accommodated as the guests of a small number of colleges. Intensive tuition will emphasise developing problem-solving and experimental skills. The group will eat together in various colleges in the evening.

Students gain places in the SPC via recommendations from their teachers. If you have pupils who will benefit from this intensive tuition, visit <http://www-spc.phy.cam.ac.uk> to register.

A bright outlook is forecast for the spring by the Meteorological Society

For those of us who live in the Norwich area, the Royal Meteorological Society has an interesting series of lectures for this spring. On 26 March, Philip Eden, vice president of the Royal Meteorological Society and director of the Chilterns Observatory Trust, will give a talk about the Chilterns Observatory Trust.

On 8 May, Dr John Turner of the British Antarctic Survey will talk about weather forecasting in the Antarctic.

Dr Jonathan P Taylor, manager of the Atmospheric Radiation Research Group of the Met Office, will talk about "The meteorological research flight", on 18 June (to be confirmed).

All of the talks are free and take place at 7.00 p.m. at the University of East Anglia, Department of Environmental Sciences. For more information, contact James Dent (e-mail jamesdent247@hotmail.com) or Vicky Ingram (e-mail v_ingram@hotmail.co.uk).

Students get free membership

If you are a student you can get student membership of the Institute of Physics free of charge. You will have all of the benefits of membership except that you won't receive paper copies of *Physics World* or the East Anglia Branch newsletter. However, in this paperless age, all is not lost. You can still read them online through *MyIOP*. (This includes the full archive of *Physics World*.)

If you have already paid for membership, either for this year or until the end of your course, you remain a member and will continue to receive paper copies of the magazines and

newsletters. In this case, do not register for free membership or you will find that you are registered twice and will get two of everything (including two requests for membership fees as soon as you graduate).

If you would like to take advantage of this free offer, join online at <http://members.iop.org/studentmembership.asp>. The form will automatically check if your course is accredited or not. If you find that your course is not listed, contact the membership development officer, Mischa Stocklin (e-mail mischa.stocklin@iop.org, tel 020 7470 4922).

If you decide that you prefer paper copies of the magazines, contact Mischa, who will tell you how to pay your £15.

Diary of branch spring events 2009

6–7 March 7.30 p.m.

Astronomy in the 21st century

By Dave Balcombe.
Norwich Astronomical Society

Seething Observatory

Admission for non-members is £2.50 for adults and £1.50 for children. For members, admission is £1.50 for adults and £1.00 for children. There is no need to book.

For more information, contact Dave Balcombe (e-mail drbalcombe@tiscali.co.uk, tel 01953 602 624).

9 March 7.30 p.m.

The spring constellations

(followed by observing session)
West Norfolk Astronomy Society
Tottenham and Wormegay Village Hall, Whin Common Road, Tottenham PE33 ORS

For more information, contact Larry Peters (tel 01366 383 109).

18 March 7.15 p.m.

Relativity for beginners

By Adrienne Leonard.

Institute of Astronomy, Madingley Rise, Cambridge

For more information, e-mail csc@ast.cam.ac.uk or tel 01223 337 510.

19 March 6.00 p.m.

A flash of lightning in creating the most exciting electric sports car on the planet

By Arthur Wolstenholme.

Pippard Lecture Theatre, Cavendish Laboratory, CU, JJ Thomson Avenue

The Science Week Lecture. For more information, visit www-outreach.phy.cam.ac.uk/cpc/.

23 March 7.30 p.m.

The Virgo cluster of galaxies and some of its gems

(followed by observing session)
Tottenham and Wormegay Village Hall, Whin Common Road, Tottenham

A West Norfolk Astronomy Society lecture. For more information, contact Larry Peters (01366 383 109).

25 March 9.00 a.m. – 4.00 p.m.

Teachers workshop on waves and optics

Cavendish Laboratory, CU, JJ Thomson Avenue

For more information, visit www-outreach.phy.cam.ac.uk/TeachWork/.

26 March 7.00 p.m.

Philip Eden: the Chilterns Observatory Trust

University of East Anglia, Department of Environmental Sciences

For more information, contact James Dent (e-mail jamesdent247@hotmail.com) or Vicky Ingram (e-mail v_ingram@hotmail.co.uk).

30 March 5.00–8.30 p.m.

Open meeting of the Cambridge Network: Cambridge ideas that could change the world

Law Faculty, University of Cambridge

This meeting will highlight ideas that are in Cambridge laboratories today, but which have the potential to change all of our lives within 10–15 years. The topics this year will include a diversity of subjects, including materials, stem cells and computing.

For more information, contact organiser Louise Rushworth (e-mail louise.rushworth@cambridgenetwork.co.uk, tel 01223 422 369).

2 April 1.00–4.00 p.m.

School workshop (11–13 years): light

Cavendish Laboratory, CU, JJ Thomson Avenue

For more information, visit www-outreach.phy.cam.ac.uk/workshop/.

2 April 7.00 p.m.

Antimatter

By Dr Dirk Peter van der Werf, Swansea University.

UEA

For more information, contact Dr Martin Loftus (e-mail cophis@uea.ac.uk, tel 01603 456 161, fax 01603 458 553).

3–4 April 7.30 p.m.

Mysteries of the Moon

By Mark Thompson.

Seething Observatory

Admission for non-members is £2.50 for adults and £1.50 for children. For members, admission is £1.50 for adults and £1.00 for children. There

is no need to book. A Norwich Astronomical Society lecture.

For more information, contact Dave Balcombe (e-mail drbalcombe@tiscali.co.uk, tel 01953 602 624).

13 April 7.30 p.m.

West Norfolk Astronomy Society open evening

(observing session, with instructions for beginners)

Tottenham and Wormegay Village Hall, Whin Common Road, Tottenham PE33 ORS

For more information, contact Larry Peters (tel 01366 383 109).

27 April 7.30 p.m.

In search of the Winged Messenger and the April Lyrids

(observing session, with instructions for beginners)

Tottenham and Wormegay Village Hall, Whin Common Road, Tottenham PE33 ORS

A West Norfolk Astronomy Society lecture. For more information, contact Larry Peters (tel 01366 383 109).

30 April 6.00 p.m.

Innovations in pharmaceutical manufacturing

The Conference Centre, TWI, Granta Park, Abington

A Cambridge Enterprise and Technology Club lecture. For more information, visit www.cetc.info.

8 May 7.00 p.m.

Weather forecasting in the Antarctic

By Dr John Turner, British Antarctic Survey.

University of East Anglia, Department of Environmental Sciences

For more information, contact James Dent (e-mail jamesdent247@hotmail.com) or Vicky Ingram (e-mail v_ingram@hotmail.co.uk).

11 May 7.30 p.m.

West Norfolk Astronomy Society open evening

(followed by observing session)

Tottenham and Wormegay Village Hall, Whin Common Road, Tottenham PE33 ORS

For more information, contact Larry Peters (tel 01366 383 109).

17 June 9.00 a.m. – 4.00 p.m.

Teachers workshop: radioactivity and the atom

Cavendish Laboratory, CU, JJ Thomson Avenue

For more information, visit www-outreach.phy.cam.ac.uk/TeachWork/.

18 June 7.30 p.m.

Met Office: the meteorological research flight

By Dr Jonathan P Taylor, manager, Atmospheric Radiation Research Group (to be confirmed).

University of East Anglia, Department of Environmental Sciences

For more information, contact James Dent (e-mail jamesdent247@hotmail.com) or Vicky Ingram (e-mail v_ingram@hotmail.co.uk).

20–21 June 6.00 p.m. (note the earlier time)

Journey to the centre of the Sun

By Mark Thompson.

Seething Observatory

A Norwich Astronomical Society lecture. Admission for non-members is £2.50 for adults and £1.50 for children. For members, admission is £1.50 for adults and £1.00 for children. There is no need to book. For more information, contact Dave Balcombe (e-mail drbalcombe@tiscali.co.uk, tel 01953 602 624).

28 June–2 July

Senior physics challenge LVIIth summer school for AS level students

(teachers recommend pupils for inclusion)

University of Cambridge

To book online, visit www-spc.phy.cam.ac.uk.

15–17 September

9.00 a.m. – 12.00 p.m. and 1.00–4.00 p.m. (six sessions)

Physics at work

Cavendish Laboratory CU, JJ Thomson Avenue.

For booking and more information, visit www-outreach.phy.cam.ac.uk/physics_at_work.