

NEWSLETTER

October 2007

Branch committee members

William Proud

Chair
E-mail wgp1000@cam.ac.uk
Tel 01223 337 205
Fax 01223 350 266

Paul Millar

Vice-chair
E-mail paul.millar@btinternet.com
Tel 07720 435 558

Jeannette Fine

Secretary
E-mail jeannette.fine@finerandd.com
Tel 01553 679 378
Fax 0871 247 0838

David Andrews

Treasurer
E-mail camben@cambridge-en.com
Tel 01954 231 494
Fax 01954 232 282

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The Institute of Physics,
76 Portland Place, London
W1B 1NT, UK.
Tel 020 7470 4800.
Fax 020 7470 4848.

Branch AGM is success

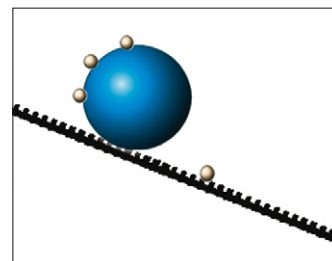
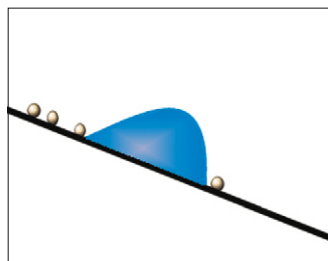
This year's branch AGM was held on 13 June in the Coleridge Room of Jesus College, Cambridge, on a hot and muggy evening. Fortunately, the windows of the Coleridge Room opened, so we were able to get a bit of a breeze until a good thunderstorm cleared the air.

Attendance at the AGM was up somewhat on last year – to about 25 – so, although we would like to move the AGM around the branch area to enable a wider spread of members to attend, it looks as though Cambridge is the best place to hold them for now.

The keynote speaker was Prof. Steiner (of the biological and soft systems group at Cavendish Laboratory), who described “Biomimetic pattern formation”, or how to mimic the small-scale structures of the natural world in the laboratory in order to produce surfaces with special properties.

One example is self-cleaning surfaces. Lotus leaves, for example, are always clean – they do not collect dirt or mud on their surfaces. (Perhaps that is why eastern gods are often shown sitting on lotus leaves or flowers.) They remain clean because they have super-hydrophobic surfaces – water just runs off them, taking dirt particles with it.

Lotus leaves are not smooth on a microscale – they are covered with hair-like filaments that are the right size and shape so that the surface tension of a water droplet keeps it from attaching itself to the hairs or running down between them. This means that the water



(Left) On a normal surface the drop slides off the surface and dirt particles are only redistributed. (Right) On a self-cleaning surface the drop rolls off the surface and dirt particles adhere to the drop.

droplet has no choice but to bounce down the surface of the leaf and then fall off it, taking the dirt on the leaf with it.

Prof. Steiner's group has succeeded in manufacturing surfaces covered with artificial filaments of the correct size and shape. The next step would be producing such surfaces in commercially sized pieces rather than the few square centimetres that they can now make. Thanks go to Prof. Steiner for a fascinating talk.

We also heard an address by the chief executive of the Institute of Physics, Dr Bob Kirby-Harris. He told us about the new strategic vision of the IOP, the main features of which were opportunities, communications and impact. Interestingly, such a vision had not been clearly defined before. Achievements in the realms of membership, education and outreach were listed. In short, the IOP is doing pretty well. It is probably one of the best-resourced physics societies in the world and the local branches play an integral part in achieving the organisation's goals.

There was an opportunity

to ask questions of Dr Kirby-Harris. The Cambridge University Science Productions representative asked about the value of communication-based outreach activities, such as podcasts. He was told that anything that brings physics to a wider audience, through whatever medium they find most comfortable, can only be construed as a good thing.

Dr Amyas Phillips asked about the influence that the IOP has on low-level curricula with respect to engineering and its relationship with physics (e.g. links to an engineering GCSE/A-level). Unfortunately, the IOP does not have sufficient resources to exert any real influence here, especially given the situation in physics education.

Dr David Andrews asked who to speak to at the IOP about schools applying for specialist science status and the Science Ambassador scheme. Schools should contact the regional officer, Esther Haines, and the IOP Teacher Network representative for East Anglia, Karen Fisher (e-mail fisherkl@slowglass.com).

Visit the branch website at anglia.iop.org

Physics competition for film-makers

The Paperclip Physics Competition never caught on as well as the IOP had hoped. The East Anglia Branch wasn't doing badly with it but we still never managed to involve more than about 50 children per year, which isn't many, considering the size of the branch and the number of secondary schools in it. One of the big problems with Paperclip Physics was always getting transport from the school to the venue.

Therefore, the IOP has decided to try something new. It has joined in with the new project from the National Endowment for Science, Technology and the Arts (NESTA) – Planet SciCast. Planet SciCast is a big UK-wide competition that aims to get children, young people, teachers, parents, science communicators and science/engineering/technology professionals to make mini-films. These films will be placed



The "SciCastie" award.

on the Planet SciCast website (www.planet-scicast.com) for the use and amusement of all.

Much like Paperclip Physics, a small team (up to five people) must explain a principal of physics so that a non-scientist can understand it. But the time limit is shorter (2½ minutes maximum) and only the film (or video, or podcast) has to travel. More people will get to see it too, because all of the entries will be viewable on the internet (but not all of them will remain there after the judging).

Films should be posted to

reach NESTA by 4 January 2008 to be included in the competition for 2007/2008. (Later entries will be reserved for the 2008/2009 competition.)

The entries will be rated by a panel of judges, with regional competitions in January and the final during Science and Engineering Week, in March.

Winners will receive (besides the pleasure of knowing that their work is on the web) the prestigious "SciCastie" award for their mantelpiece, designed and crafted by Bolton Technical Innovation Centre. There will also be prizes from the IOP for the regional winners.

Entry forms can be found at www.planet-science.com/scicast/form.html.

SciCast is supported by NESTA, the Engineering and Technology Board, the Institute of Biology, the Earth Science Education Unit and, of course, the Institute of Physics.

It's all change at the branch AGM

New officers were elected to the branch committee at the recent AGM. John Clark stood down as chair after having served two stints. He has now left the committee altogether and will be much missed.

We have also lost Tom Whyntie, our secretary, who has moved to London to do graduate work. We wish him all the best with his research. The enthusiasm and ability he showed as our secretary portend well for his future.

Please join me in welcoming our new officers: Bill Proud (chair, e-mail wgp1000@cam.ac.uk), Paul Millar (vice-chair, e-mail paul.millar@btinternet.com), Jeannette Fine (secretary, e-mail jeannette.fine@finerandd.com) and David Andrews (treasurer, e-mail camben@cambridge-en.com).

We welcome back existing committee members Mike Coleman (e-mail mikecoleman@supanet.com), Harry Druiff (Cavendish Teaching Office, e-mail hwd20@phy.cam.ac.uk), Esther Haines (IOP regional officer for East Anglia, e-mail emh1003@cam.ac.uk), Lisa Jardine-Wright (Cavendish outreach officer, e-mail lhw21@hermes.cam.ac.uk), Dennis Camilleri (e-mail dennis.camilleri@ntlworld.com), Mike Carr (e-mail michael.a.carr@magnox.co.uk) and Mike Robertson (e-mail michael.j.robertson@btinternet.com).

And finally, we welcome new committee members Dr Andrew Clarke (Kodak European Research, e-mail andrew.clarke@kodak.com), Dr Amyas Phillips (e-mail amyas@alertme.com), Sean Kavanagh (e-mail s_kavanagh@hotmail.com) and student member Casper Druvier (e-mail cd366@cam.ac.uk).

As we work closely with Cambridge Hands-On Science, one of their Naked Scientists, David Ansell (e-mail david@mythic.beasts.org), has been co-opted onto the committee so that we can ensure we get the best out of the relationship.

We are sorry to lose the services of Judith Gretton-Dann, who did a lot for the committee. We wish her well in her new job.

New physics research centre opens

The University of East Anglia will be officially celebrating the opening of the new Centre of Physics in Science (COPHIS) on Thursday 18 October with "Rock guitar in 11 dimensions!" by Dr Mark Lewney, winner of *FameLab* and guitar-playing physicist. I have seen Dr Lewney lecture and strongly recommend that, if you have the chance, you go to see him. He is very entertaining, most informative and an excellent guitar player. The world of rock lost a great deal when he went for a career in physics instead of putting a band together.

The talk will be at 5.00 p.m. in Lecture Theatre 1 at UEA. Admission is free, but booking is essential. For more information,

or to book a place, contact Dr Martin Loftus (e-mail cophis@uea.ac.uk).

COPHIS will provide a focus for physics activities across the Norwich Research Park, which has a significant amount of physics-related research activity. The centre will also offer, within the Faculty of Science, a number of physics modules to undergraduate students through the natural science degree programme.

COPHIS's initial research activities include nanotechnology (novel mechanisms for optical nanomanipulation and switching, and light harvesting in nanostructured molecular systems, and optical binding

and optical forces on micro and nanostructures); spectroscopy (high-resolution spectroscopy, especially of transient species); lasers (ultrafast lasers, nonlinear optics, molecular dynamics and complex fluids); physics education (understanding of magnetic fields, linguistics in physics and professional development); and climate (investigation of the energy balance of the Earth, how variations in solar insolation and scattering by volcanic aerosols may have affected the Earth's climate over the last 1000 years, and the physics of the weather systems and the climate system).

We wish COPHIS all success in the years ahead.

Branch builds relationships with IOP student members

The branch has agreed to provide £300 toward the Cambridge University Physics Society's annual garden party. This is a good networking event, and the physics students at Cambridge give us a lot of help with all of our outreach, especially for the December

Event and during Science Week. They are current (and future) members of the IOP and a good relationship between graduate and undergraduate members should be encouraged.

The branch is also providing £700 to Cambridge University Science Productions (CUSP),

which went to CERN in August to make a film about the Large Hadron Collider.

In addition, CUSP says that it will be pleased to have a working relationship with the IOP regarding SciCast Physics, providing advice or assistance with film-making.

Stargazing gets great new location



The Andromeda galaxy, our nearest large-galaxy neighbour, as seen from West Norfolk on 10 September 2007. The satellite galaxies M32 and M110 are also visible. Copyright Trevor Nurse.

There is a new astronomy club in the region – the newly formed West Norfolk Astronomy Society will hold its first public meeting on Monday 8 October at 8.00 p.m. at Tottenhill and Wormegay Village Hall, Tottenhill PE33 0RS.

This wonderfully dark site is just off both the A10 and A134.

If the weather is clear there will be telescopes and binoculars for viewing. If not, two lectures are planned. Your own scopes/binoculars are welcome.

Entrance is £3 including refreshments, with a member discount. For more information contact John Clark (e-mail john.clark@finerandd.com).

Committee vote adopts a revised constitution

Times change, and branch constitutions must change too. We received a draft constitution from the IOP and discussed it at the recent AGM. It was proposed (by Tom Whyntie and Mike Coleman) that this new constitution be adopted by the branch. The motion passed without opposition.

The major changes are to broaden the aims of the branch, to reflect the wider aims of the IOP, and to alter the terms of officers and the committee.

Officers (chair, vice-chair, secretary and treasurer) are now limited to serving four years in any given post. We must inform you, the branch members, at least six weeks before the AGM, of the membership of the committee, including details of those standing down or no longer eligible to serve. At that time, we must also tell you who we are nominating for

the next committee and invite other nominations from eligible members. Nominations require the support of no fewer than two branch members and the consent of the nominee.

We must also submit our budget earlier. The proposed budget for the following year must be submitted to the IOP in August, not October.

Although the rules for the election of officers and for submitting the budget have tightened, those for the AGM have loosened. We now only need to give three weeks' notice of the date and location of the AGM and we only need 12 members to be present for the AGM to be quorate. Please do not use this as an excuse not to attend the AGM. It's well worth attending for the speakers and the refreshments!

Full details will be posted on the branch website.

Institute is working on improving its bursaries

The IOP provides around 300 bursaries to undergraduate students who intend to study physics at university, with the objective of increasing the numbers in physics. Participating university physics departments are provided with a quota of bursaries to award to students on the IOP's behalf. The bursaries are worth £3000 over the duration of a bachelor's degree or £4000 over the duration of an MPhys/MSci degree. The scheme is restricted to those entering accredited degree programmes and to UK and Irish nationals.

For more information, check out www.iop.org/aboutus/The_Institute_of_Physics/Support_And_Grants/Undergraduate%20Bursary%20Scheme/page_5602.html.

The only flaw that I can see in the bursary scheme is that it cannot be used at universities, such as Cambridge, that offer natural science rather than

physics. This was discussed at the branch AGM. The problem appears to be that the bursary is meant to support those taking only courses that can be identified solely as "physics". Up to a third of the courses taken by a first-year natural science student at Cambridge may clearly be outside "physics" and some students may well start out thinking that they want to do physics but then change to another science.

The IOP has agreed to consider remedies for this anomaly, such as the possibility of awarding a part-bursary until the student is clearly committed to physics, or splitting the cost of the bursary with other societies, such as the Royal Society of Chemistry. We'll try to keep you posted on this issue.

In spite of this small niggle, I think that the bursary scheme is a very good use of our money, and I hope that it continues to go from strength to strength.

The deadline for contributions to the next issue of this newsletter is:

Friday 2 November

Please e-mail your materials to:

jeannette.fine@finerandd.com

Autumn/winter events calendar

CAMBRIDGE PHYSICS CENTRE

The new lecture programme will certainly start with a bang but will not end with a whimper. All of the talks will be held at 6.00 p.m. in the Pippard Lecture Theatre, Cavendish Laboratory, Madingley Road, Cambridge. Lectures are free and no tickets are needed, so just come along.

Thursday 11 October

Fireworks

Revd Lancaster

Kimbolton Fireworks, the Revd Lancaster's company, made the fireworks for the handover of Hong Kong and the VJ commemoration on the Thames. The company produces much of the material used in its displays and it is a master of computerised firing systems.

This lecture will demonstrate how physical and chemical principles are used to produce a wide range of visual and sound effects. Smoke, smells and some noise will be produced in this lecture.

Tuesday 6 November

Antarctica, climate change and you

Dr Jonathan Shanklin

Dr Shanklin is head of the Meteorology and Ozone Monitoring Unit at the British Antarctic Survey and was a member of the team that discovered the Antarctic ozone hole. This team was awarded the Charles Chree medal in 2000.

The pristine environment of Antarctica allows the clear and unambiguous detection of changes. The Antarctic ozone hole first appeared in the early 1980s and demonstrates that it is possible to dramatically change the atmosphere in as little as a decade. The mean temperature of the Antarctic Peninsula has risen by 3°C over the last 50 years – one of the largest changes on the planet.

This talk will illustrate the Antarctic environment, focusing on these symptoms of the health of the planet, and it will make a diagnosis of their cause.

Tuesday 4 December

The physics of skydiving

Jules Houtl, head of physics at Uppingham School and a

member of the Cambridge Physics Centre

Modern skydiving involves going to about 13 000 ft in an aeroplane, jumping out and falling before deploying one (occasionally two) rectangular (not round) parachutes at about 2500 ft, coming down to a safe, controlled landing and standing up in a place chosen by you, not by the wind.

Why 13 000 ft? Why 2500 ft? Why do you fall and how? Why rectangular parachutes and why two of them? Why the nice landing?

Using some A-level physics, a parachute harness and some video, we will find out.

For 2008 we have speakers and titles but no descriptions as yet.

Thursday 10 January

Unifying light, electricity and magnetism: the life and work of Michael Faraday

Prof. Frank James, professor of the history of science at the Royal Institution

Tuesday 19 February

A shocking solar system

Dr Emma Taylor, lecturer in the Department of Physics and Astronomy at the Open University

Tuesday 11 March

Physics at the high energy frontier: the Large Hadron Collider

Dr Val Gibson, particle physicist at the Cavendish Laboratory and fellow of Trinity College

NORWICH ASTRONOMICAL SOCIETY

The public open nights are far more than mere lectures. One can observe the sky through the society's telescopes after the talks. The society has several very good telescopes and, if the sky is clear, very dark skies – amazingly so considering how close to Norwich they are.

Doors open at 7.30 p.m. with talks starting at 8.00 p.m., unless the room fills up earlier, in which case the talk will start sooner and be repeated. Talks vary in length but generally last approximately 40 minutes and are aimed at those with a

general interest in astronomy. Children are welcome (from about 8 years old and upwards).

Admission for non-members is £2.50 for adults and £1.50 for children. For members it is £1.50 for adults and £1.00 for children. There is no need to book, just turn up on the night. Tea and coffee are available at the end of the talk.

The observatory is just outside Seething, which is about 20 miles south-east of Norwich. For directions see the society's website (www.norwich.astronomicalsociety.org.uk/info/finding.htm).

For more information, contact Mark Thompson, Broads Acre, Upper Street, Horning, Norfolk NR12 8NG (tel 01692 630 399/07809 534 268, e-mail thompsonmarkp@btopenworld.com).

19 and 20 October

Understanding the universe

Dave Balcombe

From the Big Bang to the future of the universe, from charms and leptons to galaxies, this is a straightforward introduction to a fascinating subject. Balcombe will show how the universe is evolving, with a look at some of the principal ideas and discoveries and the people behind them.

16 and 17 November

The Sun: a star on our doorstep

Mark Turner

An introduction to the Sun and how to observe it safely.

14 and 15 December

An evening with Edmund Halley

Ivan Rukaber

Edmund Halley is best known for predicting the returns of the comet that bears his name. However, this is just one snapshot from his long, exciting and often contentious life. Halley was a brilliant mathematician who made friends and enemies in high places during his many escapades, in science and for the king.

ROYAL METEOROLOGICAL SOCIETY EAST ANGLIA

Talks will be held at 7.00 p.m. in the LGMAC Seminar

Room (Env 01.38), School of Environmental Sciences, University of East Anglia, Norwich. For more information, contact James Dent at 2 Bell Mews, Hadleigh, Ipswich, Suffolk IP7 5AW (tel 01473 827 134, e-mail jamesdent247@hotmail.com).

Thursday 15 November

Farmer approaches to water management, scheduling and sensing: what can and cannot be achieved in water economy

David Martin, Plantsystems Ltd, Wisbech

Thursday 17 January

The oceanography of a small Norfolk Broad

James Kettle, University of East Anglia, and others

Thursday 6 March

Time, rainfall and landslips in the Highlands and elsewhere

Dr Mike Winter, Transport Research Laboratory, Scotland

Magical fun at December Event

Advance notice for your calendar: the ever-popular December Event will be held on Sunday 9 December this year.

This is a bit earlier than in previous years. We are hoping that holding the event just before the end of term will mean that fewer people will have to make that difficult choice between going on holiday or attending the December Event.

This year's event will be magical all round.

Unfortunately, wizards are hard to come by – most would rather do magic than talk about it, especially to the non-magical – but our speaker will amaze you nonetheless.

We will have hands-on magic to fascinate you and *Call My Magical Bluff*, although the panellists will not be permitted to cast confusion spells and the audience will not be permitted truth-telling spells. May the best enchanters win!