



PHYSICS IN IRELAND



The newsletter of the Institute of Physics in Ireland

Series 5, Number 14, September 2005

Lab in a Lorry enthuses the young about physics



The Lab in a Lorry programme is a mobile lab that aims to enthuse the next generation of scientists and engineers by giving young people (11–14 year olds) the opportunity to explore real science through some great hands-on experiments. A partnership programme between the Institute of Physics and the Schlumberger Foundation, with other partners coming onboard, the programme aims to make science interesting, fun and accessible to the young people who participate.

We were delighted to have Lab in a Lorry tour Northern Ireland for seven weeks during May and June. During this time the lab was based at 10 schools where approximately 100 pupils visited it each day. At weekends the lab was based at various events, such as Balmoral Show, North West 200, Ulster Air Show, ECOS Centre, Shanes Castle and Greenmount College, where young people and their parents got an insight into how physics impacts on everyday life.

It is estimated that 4000 of our young people visited the laboratory. This astounding success would not have been possible without the support of Sentinus, which sponsored the tour in Northern Ireland. Our thanks go to them and, in particular, to Tom Keane and his willing band of very capable students who demonstrated the different experiments so enthusiastically every day for seven weeks. We hope that this



Some budding young engineers try to get oil out of the well.



A group of pupils have fun investigating how to break a wineglass.

enthusiasm will have rubbed off and in a few years time we will see an uptake of physics in schools throughout Northern Ireland.

Young people in the Republic

of Ireland will be able to take part in the fun when the lab tours the Republic on 5–30 September (see right).

Vida Given Teacher Network coordinator

LAB IN A LORRY TOUR DATES

Republic of Ireland tour

5–9 September

BA Festival

Trinity College Dublin

Contact: Eleanor Cooke,
e-mail: eleanor.cooke@dcu.ie,
tel: 01 7008977

12–16 September

Waterford IT

Volunteers contact:

Claire Keary,
e-mail: ckeary@wit.ie,
tel: 051 302057

Schools/visitors contact:

Eleanor Reade,
e-mail: ereade@wit.ie,
tel: 051 302037

19–23 September

NUI Cork

Volunteers and
schools/visitors contact:

Anne Cronin,
e-mail: ae.cronin@ucc.ie,
tel: 021 4903299

24 September

Frontiers in Physics,
University of Limerick

26–30 September

NUI Galway

Volunteers and
schools/visitors contact:

Gary Gillanders,
e-mail: gary.gillanders
@nuigalway.ie,
tel: 091 492 529

Einstein Year events programme

This calendar lists selected public events organized for Einstein Year. A searchable database of Einstein Year events is available at <http://www.einsteinyear.org/ireland>. For a list of Einstein Year and Hamilton Year events, visit <http://www.science.ie/>.

Save the Robots

The Ark, Dublin
22 June – 30 September
An exhibition, festival and workshop series celebrating the astounding and bizarre world of artificial humans and mechanical beasts. See <http://www.robots.ie/>; tel: 01 6707 788.

The BA Festival of Science

Trinity College Dublin
3–10 September
Science for young people and the general public, which has an Einstein and Hamilton section in the programme. See <http://www.the-ba.net/the-ba/Events/FestivalofScience/>.

Lab in a Lorry Tour

5–30 September
See <http://www.labinalorry.org.uk/> and schedule (p1).

Frontiers in Physics

University of Limerick
24 September

Conference for Physics Teachers.
See <http://www.ul.ie/frontiers05/>.

Physics on Stage 3

Physics demonstration booklet with fascinating easy-to-reproduce demonstrations, to be issued free to science and physics teachers in Ireland. Currently available in PDF format at <http://ireland.iop.org/sos/>.

Einstein Year Lectures

University of Limerick and Analog Devices
Dates and venues to be announced.



Schools Poster Competition: Science in Our Life

There will be a special prize for the best entry with an Einstein focus. There will be two categories: primary school and secondary school. Deadline for entries is 4 November. Organized by the University of Limerick in association with the IOPI. Contact Vicky (tel: 061 213 082; e-mail: vicky.kelly@ul.ie).

European Group for Atomic Systems holds popular conference in Dublin

The 37th Conference of the European Group for Atomic Systems (EGAS) was held on 3–6 August 2005 at Dublin City University. More than 200 delegates from 32 countries attended this annual conference, which focuses on a broad range of fundamental and applied fields of physics related to atoms and their interactions with photons.

The conference featured 16 lectures by invited speakers, with oral and poster contributions. Marc Vrakking (FOM Institute, Amsterdam, the Netherlands) and Margaret Murnane (JILA, University of Colorado, USA) informed delegates about the latest developments in atomic and optical physics performed with attosecond laser pulses. Gerard Gabrielse (Harvard University, USA), Jeffrey Hangst (CERN and University of Aarhus, Denmark) and Ryugo Hayano (University of Tokyo, Japan) spoke about the latest developments in experiments with antihydrogen (a positron bound by an antiproton). Other topics included experiments with Bose–Einstein condensates, quantum optics with large molecules, quantum dots, clusters, experiments with synchrotron radiation, and environmental monitoring using optical techniques.

During a ceremony and



Prof. John Costello (Dublin City University, chair of the local organizing committee of EGAS 37) thanks Prof. Anders Bårány (Nobel Museum, Stockholm) for his IOPI-sponsored lecture “Einstein’s Nobel Prize”.

IRCSET poster session, organized in conjunction with the conference, Jim O’Doherty (University of Limerick) received the IRCSET Physical Sciences Communications Award for his presentation “Subsurface imaging by polarized light rejection for assessment of skin blood concentration”.

In celebration of Einstein Year 2005, two lectures at the conference were organized jointly with the Institute of Physics in Ireland. Prof. Anders Bårány (Nobel Museum, Stockholm) spoke about “Einstein’s Nobel Prize” and why Einstein was awarded the prize “for his services to theoretical physics, especially for his discovery of the law of the photoelectric effect”. The Nobel Museum has organized a special exhibition on Einstein (<http://nobelprize.org/nobel/nobelmuseum/>).

Prof. Serge Reynaud (Université Pierre et Marie Curie, Paris, France) spoke about “Relativity, atomic clocks and optical links”, highlighting that the status of time raises questions in quantum theory and its compatibility with relativistic measurements. Both lectures attracted a lot of attention from EGAS delegates, IOPI members and some members of the public.

The conference tour went to Powerscourt and Glendalough, and the conference dinner was held in Dublin Castle, enabling delegates to obtain a flavour of the history and scenery that are on offer in Ireland.

Peter van der Burgt Secretary, EGAS 37
John Costello Chair, EGAS 37



Left to right: Stefan Hutzler, Albert Einstein (played by physics student Donnchadha Quilty), Sara McMurry and Iggy McGovern.

Trinity College hosts a special day for Einstein

The Department of Physics at Trinity College Dublin designated Friday 8 April as Einstein Day as part of the International Year of Physics. A series of seminars on Einstein’s classic papers of 1905 were given. These were “The photoelectric effect – a 21st-century experiment”, by Prof. Iggy McGovern, “Brownian motion – proving the existence of molecules” by Dr Stefan Hutzler and “Did Einstein deserve the Nobel Prize for special relativity?” by Dr Sara McMurry.



Radar measures speed in sport



A student throws a baseball into the net with attached radar equipment.



Another hits a tennis-ball into the net using a hurley, achieving 33 mph.

As part of the celebrations of Einstein Year 2005, the basics of radar were demonstrated at the Kit Kat All-Ireland Track and Field Championships this year in Tullamore Harriers Stadium on 4 June 2005. John White and Yurgos Politis of University College Dublin were on hand with a radar gun, speed display board and safety netting to record the speed of various struck objects, from soccer balls to hurley solitair to tennis balls.

Young, as well as a few older participants, queued up to try

their luck at recording their speed with the same radar technology used by police forces around the world. The radar gun sends out a series of radio waves and measures speed by comparing different return times, as in the Doppler effect. Interestingly, the Garda Síochána in Ireland no longer use radar, as it was successfully challenged in court, since radar uses a longer, harder-to-resolve, radio wavelength. Collimated infrared laser technology (or Lidar) at 904 nm is now used in



Ireland. Nevertheless, radar is perfect for the fast-changing, smaller objects found in sport and can even pick up the speed of falling raindrops.

Great fun was had by all, with thousands of speeds recorded over an eight-hour period. Some had numerous attempts at improving their best effort. Kevin Corcoran from Colaiste

Mhuire, Tourmakeady, County Mayo, topped all-comers with a 104 mph tennis serve and a 60 mph soccer kick. The girls enjoyed competing as well, reaching 82 mph for a tennis serve with a tie for the top soccer kick at 48 mph.

All of the participants went away with a "Physics is fun!" sticker and a better idea of the basics of radar. Einstein Year T-shirts were given out as spot prizes throughout the day.

John White University College Dublin

Trinity College stages *Calculus* by Carl Djerassi

Set in 1712, *Calculus* tells the story of how Sir Isaac Newton set out to defend his claim to have invented the calculus against that of Gottfried Leibniz.

Calculus is not about mathematics or science but rather about the behaviour of scientists. The play dramatizes the ways in which the ethical failures of scientists can interfere with the science that they promote. It explores the moral issues in one of the greatest scientific battles of the second millennium, when Newton spent decades contesting German-born Leibniz over credit for the invention of calculus. Newton assembled a committee of 11 honourable men, all Fellows of the Royal Society, to adjudicate on the matter. The play examines the motivations of the Royal Society committee when put under pressure by the greatest scientist of their age.



Bill Golding (left) and Johnathan Ryan in their leading roles in the staged reading of Carl Djerassi's play Calculus, performed in the Physics Department of Trinity College Dublin on 17, 19 and 20 May.

As part of the celebrations of Einstein Year, *Calculus* was staged at the Schrödinger Lecture Theatre in the Physics Department of Trinity College Dublin on the 17, 19 and 20 May. With the raised dais for the central action, framed by

burning candles and large brooding images of Newton and Leibniz, the perfect atmosphere was created for this historical and scientific conflict. The excellent performance illustrated the politics and struggle associated with the

ownership and glory of scientific discovery – issues that reverberate through to the present day.

Calculus was written by Carl Djerassi, a chemist and an emeritus professor of Stanford University, who invented "the Pill" in 1951. Djerassi was there to witness and contribute to this attempt at bridging the gap between the scientific and artistic approach to an understanding of our world.

The play as directed by Philip O'Sullivan and produced by Denis Weaire, with sponsorship from Trinity College, TCD physics department, Trinity Trust Foundation and Einstein Year – the Institute of Physics.

Photos of the cast and stage setting can be found at <http://www.maths.tcd.ie/~wiebke/PHYSICsART/CALCULUS/Calculus.htm>.

Alison Hackett Institute representative

IOPPI puts on a meeting for physics department heads

On 10 May the Institute of Physics in Ireland hosted a meeting of the heads of third-level physics departments in the Royal Irish Academy. There was an excellent attendance with almost all of the departments in Ireland represented.

The main focus of the meeting was a presentation by Dr Barry McSweeney, chief science adviser to the government, followed by a lively and extensive question-and-answer session.

McSweeney outlined many aspects of his work, including his role in a number of high-level committees, such as setting the agenda for the Advisory Science Council and chairing the Research Funders Group. He stressed the importance of cohesiveness across the range of government departments dealing with science, and his own role in achieving this.

He rather tantalizingly drew attention to his office's recent SWOT (strengths, weaknesses, opportunities and threats) analysis of Ireland as a knowledge-based economy. Based on 72 reports issued over the last three years, the area has been distilled down to 11 key issues. While not giving away much detail, he indicated that this report, due to be published at the end of June, will form the basis of much of government planning for science and technology.

McSweeney made clear that while ICT and biotechnology are priority areas for funding, he regarded physics as one of the

strategic research disciplines. He suggested that, in relation to teaching, the content of physics and ICT courses will merge over the next few years, indicating the need for close co-operation between departments in this area.

He discussed the need to have new mechanisms to increase research capacity, particularly in Irish industry, in order to achieve the Lisbon/Barcelona EU targets, and he indicated Irish success in influencing the recent Framework 7 proposals for the next round of European funding.

In considering the implications of the recent OECD recommendations that there should be a doubling of PhD numbers, McSweeney made very clear that he was recommending that this should not happen without first increasing the number of principal investigators and substantially enhancing the physical research capacity. His view was also that such an increase should be driven by strategic reasons rather than just numerical considerations. Given that the quality and number of senior researchers would be critical to any expansion of postgraduate researchers, he highlighted that a researcher career structure needs to be developed and in this context he mentioned the possibility of new seven-year contracts for researchers.

One particular issue, which certainly caught the attention of the meeting's participants, was the revelation that a live register of all researchers in Ireland is to

be established. He pointed out that at present, it is extremely difficult to get an accurate measure of the number of people involved in research with an estimate ranging from 2000 to 30 000. Under the new system, all grant applicants will have to maintain a profile on the database giving details of the numbers of papers/grants/postdocs, etc. This information will have to be validated in the first instance by the universities.

During the energetic discussion period that followed McSweeney's presentation, multiple concerns specific to physics were raised, including the provision of undergraduate lab facilities, the current funding structure which made teaching the poor relation of research, tax policies to enhance science, the implementation of the 2002 Task Force on Physical Sciences report and, of course, funding, funding and funding.

Some suggestions that came from the floor included such innovative ideas as following the Danish tax model, where all science researchers pay 50% of the normal tax rate. While this met with warm approval from all, the chief scientist indicated that his influence on tax matters might not be extensive. However, a related suggestion of tax breaks for industry involved in undergraduate training was certainly not dismissed out of hand.

In relation to the taskforce report, he said that the deputy chief scientist, Dr Carol Gibbons,

who is based in the Department of Education and Science, is currently looking at this with the department and he is hopeful of having it implemented as part of a broader picture in the next National Development Plan.

In response to concerns voiced about differences in policies between funding from PRTL and SFI on researcher salaries, he unambiguously replied that there would be a harmonized policy across all of the funding agencies in relation to areas such as pensions and contracts.

Following the meeting, McSweeney stayed for lunch and took many more questions individually, giving very generously of his time.

Overall a recurring theme from the chief scientist was that of the absolute necessity for joined-up thinking between government departments and agencies, and he clearly identified this as one of his priorities. The lasting impression given was of a man highly committed to science in Ireland, a straight-talker with a healthy respect for common sense and an individual with exceptional energy. The Institute certainly looks forward to continuing to work with his office to highlight the issues of concern at the heart of physics in Ireland.

For more information about the work of the office of the chief science adviser to the government see <http://www.c-s.ie/index.html>.

Sheila Gilheany Institute Policy Officer

Belfast stages conference for physics teachers

This year's annual Physics Teachers Conference was held in Queens University Belfast and incorporated the official opening of the IRCEP Building.

A total of 55 physics teachers

from Ireland attended the conference. The theme this year was support for physics teachers, both specialist and non-specialist.

All who were present enjoyed the enlightening demonstrations by Randal Hendly and were given an introduction to the innovative Institute's CD resource "Supporting physics teaching 11-14".



Physics teachers enjoy trying to study the flight of rocket balloons.

ISTA AGM promotes science for all

The Institute of Technology in Carlow was the setting for this year's Irish Science Teachers' Association "Science for All" conference. Hundreds of teachers from around Ireland attended and were treated to first-class demonstrations, talks and numerous exhibits in the ITC main hall.

Dr Ruaidhrí Neavyn, the director of ITC, welcomed the delegates to the Institute, applauding and encouraging teachers in their quest to educate. He outlined the need to promote science as a career opportunity and investment in secondary school laboratories, and he stressed that more co-operation and interaction is needed between 1st, 2nd and 3rd levels. "Science and science education is pivotal for a developed society," he remarked.

Gerald Fleming of Met Éireann was the keynote speaker and gave an informative and topical talk entitled "The most



Siobhan Greer (past chair of ISTA) with Gerald Fleming (Met Éireann) who presented "The most important forecast of the century – will our climate change?" talk at this year's ISTA conference in Carlow.

important forecast of the century: will our climate change?". He likened predicting the weather to predicting the final destination of a drunken man from his first few steps after exiting a pub – not an easy task. Indeed, as Fleming showed, "Weather is a very variable phenomenon – hourly, daily, monthly, yearly – and extracting

long-term trends is difficult."

Numerous workshops emphasized how teachers can use practical demonstrations in their classes with nothing more than local detergents or various household goods. Prof. Denis Weaire of Trinity College Dublin amazed everyone with his brilliant 2D soap froth patterns in his Cunningham Medal

"Throwing shapes" talk.

The Tyndall lecture by Dr Norman McMillan of ITC was of particular interest because Tyndall was born in Carlow. McMillan gave an exciting hands-on series of demonstrations highlighting the contributions of the world-renowned Carlow scientist, from the refreezing of ice by a blow from a hammer to creating an artificial sky and sunset showing the scattering of light – an effect first explained by Tyndall.

Many other concurrent talks and workshops were given over the two-day programme, finished off by an audiovisual extravaganza called "Musical squares" by Mike and Wendy Gluyas, who demonstrated sound from musical instruments to animals, from aeroplanes to medicine. All in all it was a great meeting in Carlow, showing that science really is for all.

John White University College Dublin

Institute sets up a bursary scheme

The Institute intends to introduce an Undergraduate Bursary Scheme in the 2006/7 academic year. Bursaries will be worth about £1000 per year and will be available on a means-tested basis to students in the UK and Ireland taking Institute-accredited physics courses. All recipients will receive the award for each year of the course. It is believed that 200–300 bursaries will be awarded every year with around 2–15 being available for each physics department.

Details are being worked out by the Institute, so this adds a certain urgency to departments that have not yet completed the accreditation process. A full register of accredited courses can be found at <http://policy.iop.org/IOP/accreditation.html>.

The aim of the scheme is to assist students who might otherwise be deterred from studying physics at university for financial reasons. For more details, see <http://policy.iop.org/> (click on "Undergraduate Bursary Scheme").

National Academy of Sciences elects Coey as foreign associate member

Prof. Michael Coey of the Department of Physics at Trinity College Dublin has been elected to membership of the National Academy of Sciences as a foreign associate, in recognition of his distinguished and continuing achievements in original research in magnetism and magnetic materials.

Coey is currently the only Irish-based scientist to belong to the academy. This prestigious achievement was announced by the Provost of Trinity College, Dr John Hegarty at the Trinity Week Symposium. "Election to membership of the academy is considered one of the highest honours that can be accorded a scientist or engineer," he said in warmly congratulating Coey.

Coey is one of a handful of Irish scientists to be elected a member. Previous Irish members include George Stokes, Charles Parsons and, of course, Sir William Rowan Hamilton. Hamilton, another Trinity



Prof. Coey is pictured alongside a poster showing William Rowan Hamilton and advertising the Hamilton Symposium that took place in Trinity College Dublin during Trinity Week. Photo by Mac Innes Photography, Dublin.

professor, was elected as the first foreign associate in 1864, one year after the academy was founded by Abraham Lincoln.

A professor of experimental physics, Coey is also deputy director of the Centre for Research on Adaptive

Nanostructures and Nanodevices. His research interests include magnetic, electronic and structural properties of solids, spin electronics, amorphous materials, physical properties of minerals, and magnetochemistry.

A one-day symposium was organized earlier this year to celebrate Coey's 60th birthday. This "C60" symposium featured Stuart Parkin (IBM Almaden Research Centre, San Jose, USA), Rex Harris (University of Birmingham), John Pethica (Trinity College Dublin and Oxford University), Dominic Ryan (McGill University, Canada), Ralph Skomski (University of Nebraska, USA), Dimitris Niarchos, (NCSR "Demokritos", IMS, Athens, Greece) and Michel Viret (CEA Saclay, France). Several of Coey's ex-students also participated in the meeting. **Cormac McGuinness** Trinity College Dublin

News from Trinity College Dublin

Following the restructuring of Trinity College, Prof. James Lunney has been appointed as the new head of the School of Physics, taking over from Prof. Denis Weaire, who is the outgoing head.

A new lecturer in the Department of Physics is Dr Peter Nellist, who took up his appointment in September 2004. He is returning to academia after spending four years in industry, having been based in Seattle. His research interests include the application and development of atomic resolution electron microscopy and spectroscopy.

In September 2003, Dr Cormac McGuinness joined the lecturing staff in physics after an absence from Ireland of more than four years. McGuinness' current interests are the study of the electronic structure of organic and oxide semiconductor materials through synchrotron based soft-X-ray emission and absorption spectroscopy as well as photoemission spectroscopy.

On 8 July two distinguished physicists were conferred with honorary doctorates. The first was conferred on Prof. Alan Heeger (Department of Physics, University of California, USA), who received the Nobel Prize for Chemistry in 2000. The evening before he gave a lecture entitled "Risk and innovation in science – a personal history: the route to the Nobel Prize". This amusing lecture detailed his historic research on conducting polymers for which he received the prize, the subsequent development of the field and the creation of novel products and commercial technologies. The highlight was his description of the announcement and ceremonies associated with receiving the prize. The lecture was very well received and was followed by a lively reception.

The second honorary doctorate was conferred on Prof. Cecilia Jarlskog (Department of Mathematical Physics, Lund Institute of Technology, Sweden). She is a particle physicist who has been an advisor to CERN and is also a member of the SFI board.

Trinity College organizes events for Hamilton Year

Several events took place at Trinity College Dublin during Trinity Week in celebration of William Rowan Hamilton. 2005 has been designated by the Irish Government as Hamilton Year in recognition of the bicentenary of his birth.

On Monday 16 May a discourse was given by Prof. Iggy McGovern on the life and career of Hamilton. On Wednesday 18 May a one-day Hamilton symposium was held, entitled "Hamilton in Trinity: a celebration", and organized by the Hamilton Mathematics Institute and Prof. Siddhartha Sen. The symposium featured a mixture of talks on Hamilton's contribution to physics and to life at Trinity College.

The seminars included "Demonstration of conical refraction" by Prof. James Lunney (physics, TCD) and Prof. Michael Berry FRS (physics, University of Bristol), "Science, creativity and poetry" by Brendan Kennelly, the well known poet and professor of English at Trinity College, and "Hamilton in Dunsink" given by Prof. Luke Drury, a Trinity scholar and senior professor at the Dublin Institute for Advanced Studies. "The impact of Hamilton's ideas in physics



Left to right: William Rowan Hamilton (played by actor Eoin Rowe), Luke Drury, Gordon Herris Davies, Alan Newell, Michael Berry, James Lunney, Siddhartha Sen, Mike Coey and David Simms at the "Hamilton in Trinity: a celebration" symposium that was held on 16 May at Trinity College Dublin. Photo: MacInnes Photography, Dublin.

and mathematics" by Alan Newell was the fourth seminar of the symposium. Newell was a Trinity scholar before going on to carry out pioneering research in applied mathematics. He is now a mathematics professor at the University of Arizona. Lastly, Prof. Michael Coey (physics, TCD) spoke of "Trinity at the time of Hamilton". In the 1830s and 1840s Trinity College played an important role in the Great Magnetic Survey, which mapped geographical and temporal variations in the Earth's magnetic field. This was the first great international scientific

collaboration.

The undoubted highlight of the symposium was the unexpected appearance of Hamilton himself (played by actor Eoin Rowe). He thanked all of the speakers involved, delivered a speech and proudly presented the commemorative €10 coin struck by the Irish government to celebrate the 200th anniversary of his birth.

More information about the Hamilton coin can be found at [http://www.centralbank.ie/Notes & Coins/Commemorative Coins & Coin Sets](http://www.centralbank.ie/Notes%20&%20Coins/Commemorative%20Coins%20&%20Coin%20Sets)).

Physics on Stage 3 launches booklet

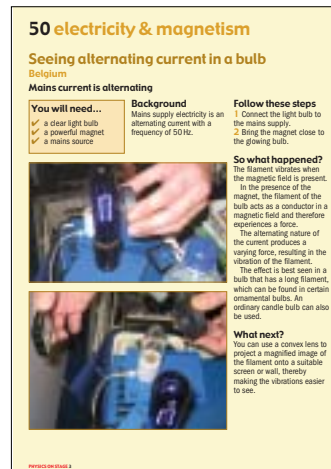
A booklet entitled *Physics on Stage 3* will be issued to science and physics teachers throughout Ireland during September and October. The page shown is an example of one of the demonstrations – "Seeing alternating current in a bulb".

The booklet was produced with the support of the Institute of Physics in Ireland, Discover Science and Engineering and Physics on Stage, and it was produced by Institute of Physics Publishing.

Chapters of the booklet can also be downloaded from <http://ireland.iop.org/sos/pos3book.html>.



The cover (left) and a sample page of the Physics on Stage 3 booklet.



Science on Stage is to be held in Cern in Geneva



- Are you interested in new ideas for teaching science from all over Europe?
- Are you willing to share the ideas of Irish science teachers with those from other countries?
- Did you use any ideas from the Physics on Stage 2 booklet? If the answer to any of these is “yes” then read on.

You might be one of the enthusiastic teachers we are looking for to travel, all expenses paid, as part of the Irish delegation to a European extravaganza of science teaching to be held on 21–25 November 2005 in CERN, Geneva. The purpose is to share all of the best ideas about teaching science among European secondary school teachers. In addition, there will be a topic for each day of the festival, around which presentations, demonstrations and workshops will be themed. The topics will be Einstein day; Sustainability day (e.g. environment, climatology, oceanography, energy); Space and astronomy day; Life sciences day (e.g. health, biotechnology, genetics); and Science and technology in society day.

The Department of Education provided paid cover for the teachers to attend Physics on Stage 3. For Science on Stage this has again been requested but at the time of going to press we don't have confirmation.

If you are interested, contact without delay irelandsos@gmail.com or write to: Science on Stage, School of Physical Sciences, Dublin City University, Glasnevin, Dublin 9.

The Ireland Science on Stage committee consists of Eilish McLoughlin, Alison Graham, Paul Nugent, Sean Fogarty, Vida Given, Siobhan Crowe, John Hennessy and Michael Grehan. For more details about Science on Stage and Physics on Stage, see <http://ireland.iop.org/sos/>.

Weaire receives Cunningham Medal

Prof. Denis Weaire, head of the physics department at Trinity College Dublin, has been awarded the premier award of the Royal Irish Academy, the Cunningham Medal.

The highlight of Weaire's research was the discovery of the Weaire–Phelan structure: an ideal structure of equal-sized foam bubbles with the least possible surface area. This research was published in 1994, supplanting the 1887 conjecture of Lord Kelvin. That it has the lowest possible energy (or surface area) remains to be proved, but all attempts to beat it have failed in the last decade and thus the two Irish physicists, Weaire and Phelan, still hold the world record for the most efficient structure of this kind.

Awarded every three years for “outstanding contribution to scholarship and the objectives of the academy”, the Cunningham Medal was first presented in 1796. Ireland's finest scientists and scholars have been among its recipients, including Sir William Rowan Hamilton, the greatest scientist Ireland has produced; Sir William Wilde, polymath and father of



David Grouse, Dr Wiebke Drenckhan and Prof. Denis Weaire with the *Throwing Shapes* sculpture that represents the Weaire–Phelan structure.

Oscar Wilde; and Frank Mitchell. *Throwing Shapes*, a large stainless steel sculpture that represents the Weaire–Phelan structure, was unveiled on 23 February by Senator Mary Henry at Trinity College. Physics department staff member Dr Wiebke Drenckhan developed the detailed design, based on that of Weaire and Phelan, and it was executed by colleague David Grouse in the department's workshops. It can be viewed in the entrance hall of the SNIAM Building.

The Weaire–Phelan structure

is also the inspiration for the architectural design of the structural framework of the Water Cube, the national swimming centre for the 2008 Beijing Olympics.

For more information, see the article prepared for *EuroPhysics News* by Drenckhan: http://www.maths.tcd.ie/~wiebke/PHYSICsART/WP_STRUCTURE/WeairePhelan_EurophysicsNews.pdf and the Water Cube website: <http://www.arup.com/eastasia/project.cfm?pageid=1250>.
Cormac McGuinness Trinity College Dublin

IOP prizewinners achieve the double



Left to right: Martin Quigg, Vida Given (Institute Teacher Network Coordinator), Benjamin McKillen, Julie Corbett (judge and IOPI committee member), Paul Nugent (judge and Institute Teacher Network Coordinator).

Congratulations go to Martin Quigg and Benjamin McKillen of Loreto College, Coleraire for winning the Institute's prize at the Seagate Young Innovators competition held in the Odessey Arena in Belfast on 23 June.

In their project, “Antibubbles”, they studied how antibubbles are formed and they used their physics to take measurements of

the thickness of the air film enclosing the bubble of liquid. The project was well ahead of other physics projects in content and presentation.

Martin and Benjamin were also the winners of the IOPI Special Prize at the Esat-BT Young Scientist and Technology Exhibition in January 2005 (see the March 2005 newsletter, p4).

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Check out the branch website

<http://ireland.iop.org>

Conference announcements

Where Physics Meets Medicine

13 October, 11.00 a.m. – 4.00 p.m. Prince of Wales Hotel, Athlone, €60 per person, lunch included.

The Institute of Physics in Ireland and the Irish Medical Devices Association are jointly hosting a one-day meeting to explore cutting-edge areas of research in Ireland and their possible applications to the medical physics industry. This event, organized along with BioMedIreland, will bring together academics and businesses as some of the most innovative research in Ireland is profiled.

BioMedIreland is a new all-ireland network, established by IMDA, IBIA, BioBusiness NI and InterTradelreland, to facilitate and enhance the competitive positioning and innovation capabilities of the health technology and biotechnology sectors on the island of Ireland. The event is also supported by the Atlantic Lasers and Optics Forum.

Speakers will include:

Prof. Chris Dainty, SFI professor of experimental physics, NUI Galway, “Adaptive optics in vision science”;

Prof. James McLaughlin, director

of the Nanotechnology Research Institute, University of Ulster, “Bio-nanomaterials and devices”;

Dr Neil O’Hare, assistant head of medical physics and bioengineering department, St James’ Hospital, “Product development and assessment”;

Colin Coates, Andor Technologies, Belfast, Macular Degeneration – Collaborative Investigations with the Department of Ophthalmology, Royal Victoria Hospital;

Prof. Tom Glynn, director of the National Centre for Laser Applications, NUI Galway.

A link for registration will be provided at http://www.imda.ie/0/imda_events.

Young Physicists’ Conference 2005



Spring Weekend Meeting 2006

This year’s Spring Weekend Meeting will be held in the Great Northern Hotel, Bundoran,

County Donegal, on 31 March – 2 April 2006. Note that this is a week earlier than usual.

Full details will be mailed to members and posted at <http://ireland.iop.org/weekend.html>.

Frontiers of Physics 2005

The annual conference for physics teachers, organized by the National Commission for the Teaching of Physics and the Institute of Physics in Ireland, will be held on 24 September in the Department of Physics of the University of Limerick.

More information can be found at <http://www.ul.ie/frontiers05/>.

A day of lectures, demonstrations, and workshops will be organized for post-primary teachers of physics at all levels. The objectives are:

- to inform teachers of the exciting and innovative work at the frontiers of physics that is being carried out in Ireland;
- to provide teachers with examples of simple and inexpensive physics demonstrations;
- to inform teachers of the latest developments and resources available in physics teaching (this will include the new Institute’s “Supporting

physics teaching 11–14” initiative);

- to commemorate Einstein Year and Hamilton Year.

Details will be sent to all post-primary schools in advance of the conference.

Contact Dr George McClelland, Head, Department of Physics, University of Limerick (e-mail: george.mcclelland@ul.ie) Paul Nugent, Institute Network Coordinator (e-mail: paulnugent@eircom.net).

PD 2005

This annual professional development conference, organized by the Institute, will take place on 24–25 October in London. The event is about exploring your own skills and talents and enhancing your ability to work in different situations within your organization.

In store for 2005 is are setting and achieving personal goals; communication skills – how to handle yourself, your manager and your colleagues; time management; avoiding stress; team building; delegation; chartered status – what it is and how you get it; and excellent networking opportunities.

Further details can be found at <http://careers.iop.org/2005/>.

5th Framework Aqua-STEW project is a success

The 5th Framework Aqua-STEW (Surveillance Techniques for Early Warning) project has been wrapped up successfully.

The project involved two water companies (IRH, Nancy, and ADASA, Barcelona) and four Irish partners (University College Dublin, Carlow Institute of Technology, Queen’s University Belfast and Carl Stuart Ltd, Tallaght) and was focused on testing online monitoring strategies for pollution in real waters (i.e. rivers, lakes, etc).

The Final Report commented favourably on both the testing of the spectral signatures (Dr Eon O’Mongain, University College Dublin) equipment for water colour/turbidity quality monitoring system and the Carl Stuart drop analysis

instrumentation. The latter work was undertaken at Carlow Institute of Technology and led by Dr Norman McMillan and Dr Brian O’Rourke. Prof. Fionn Murtagh (computer science, Queens University Belfast) developed the data-mining approaches for the multimeasurand measurement systems.

Importantly, the Carlow work undertaken with IRH demonstrated the utility of the drop analyser for monitoring solvents and PP (priority pollutants, including PAH, pesticides, herbicides and phenols). The project work on PP centred on naphthalene as being the most accessible compound to trial the new monitoring technology. The

priority pollutants targeted in the Aqua-STEW project are 19 dangerous chemicals that are among the top 33 chemicals on the water-monitoring hit list in the field of EU Water Policy.

The next stage in the work will go beyond the EU project to build commercial prototypes with the best currently available ultraviolet detectors and thus to establish in practice the detection limits for these PP measured in real waters.

Assistance in developing this aspect of the project has already come from Ocean Optics, which is the leader in the field of optical detectors and sources. Detection limits for these compounds are now known and several are of a quality that will greatly interest legislators. Very promising

results with low detection limits have been obtained for the enhanced equipment for naphthalene, anthracene, simazine, mecoprop, biphenyl, linuron, 4-octylphenol, MCPA, atrazine, isoproturon and diuron.

It looks as if this drop analysis technology offers potential for monitoring Europe’s rivers and water supplies because the site testing in Nancy, part of this EU project, demonstrated the great sensitivity of the drop analysis technique for monitoring solvents that are a major problem in the water industry, especially around industrial centres such as Barcelona. Carl Stuart has the responsibility in the EU project for commercializing the drop analyser technology.

Norman McMillan IT Carlow