

YORKSHIRE PHYSICS NEWS

The newsletter of the Yorkshire Branch of the Institute of Physics

Autumn 2007



Committee members

Chair and industry representative
J W Hemingway CSci CPhys MInstP
Tel 01274 878 970
E-mail john.hemingway@btconnect.com

Honorary secretary, careers coordinator and media representative
C A Butlin CPhys FInstP
Tel 01904 607 169
E-mail ChrisAButlin@aol.com

Honorary treasurer
G I Jones CPhys MInstP

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The Institute of Physics,
76 Portland Place,
London W1B 1NT, UK.

Tel 020 7470 4800.
Fax 020 7470 4848.

Science gains new idol

Marieke Navin, a postgraduate student in the Department of Physics and Astronomy at the University of Sheffield, hit the heights in this year's NESTA FameLab competition.

NESTA (National Endowment for Science, Technology and the Arts) is the largest single endowment in the UK exclusively devoted to innovation. The competition has been described as science's equivalent to *Pop Idol*.

Its aim is to encourage scientists and engineers to inspire and excite the public imagination with a vision of science in the 21st century. The organisers are looking for the new voices of UK science and engineering who will be able to develop their ideas and presentation skills for an adult audience.

"We're trying to identify fabulous scientists with personality and humanity and develop and support them to become the Attenboroughs of tomorrow," said Prof. Kathy Sykes, one of the judges.

Navin received a first-class degree in physics and astronomy from the University of Sheffield in 2000. She then spent a year earning, followed by a year burning – following the Sun around the world – and then six months teaching science in Ghana, returning to Sheffield to study for a PhD in 2003. She is now writing up her thesis on a scintillator detector for a neutrino oscillation experiment.

Last year she spent six weeks helping to repair a huge underground water neutrino



Marieke Navin in full flow at this year's NESTA FameLab final.

detector deep in the Japanese Alps. Navin's hobbies are learning Japanese and sign language, singing in the university choir, meditating and, until recently, wedding planning and making a silver

wedding dress. She was married last August, so she still counts as a newly-wed. There were seven regional heats with 130 scientists and engineers giving a three-minute presentation to the judges. Navin won the

York heat of the competition by wowing the judges with a talk on neutrinos and the Big Bang.

Together with seven other finalists she then took part in the grand final at the Cheltenham Science Festival on 6–10 June.

She impressed the judges with her talk on the Large Hadron Collider at CERN and was declared the national runner-up.

The winner, who was also a physicist, gave a fabulous show on the science of microwaves that went down extremely well with the audience.

As part of the final master-class, each finalist recorded an audio podcast and a video podcast known as a vodcast.

They can be seen at channel4.com/famelab and viewers were asked to vote for their favourite. Navin was the winner of the vodcast prize.

Winning FameLab must have had a dramatic effect on Navin's future plans, as her dream is to be the face of science on a TV science programme.

The exposure given as a FameLab winner should be invaluable. Here in her own words is an account of her experience of the FameLab competition:

"I first read about FameLab in the Institute of Physics newspaper *Interactions* back in 2005. It is the *Pop Idol* of science and a formidable way to break into the world of media and science communication, about which I am passionate.

"I was excited and fascinated by the competition but did not have the confidence to enter it. Instead I registered for e-mail updates and eagerly followed the progress of the finalists. This I repeated in 2006. However, by this year I had mustered up enough courage to enter, first watching the London, Cardiff and Plymouth finalists appear on the website.

"I was one of the first to arrive at York National Railway Museum early on a Saturday morning in March. After chatting with some of the other entrants, we went in for the first round by 9.30 a.m. It was interesting to listen to the wide variety of subjects that people came to talk about, including the science of skiing and the chemistry of catalysts. We had three minutes to wow

the judges with a talk about any aspect of science.

"I talked about neutrinos; how they are ghostly and elusive particles, so weakly interacting that not even a light-year-thick piece of lead can stop them. The judges gave everyone friendly and constructive feedback. I was thrilled to win the first round and secure my place in the final at 3.30 p.m.

"This gave me the opportunity to watch the rest of the heats, and I spent my lunchtime surrounded by museum visitors among the train exhibits, practising my talk for the final.

"At 2.00 p.m. we attended a one-hour communication skills master-class, although I have

However, when I actually stood up in front of the audience the worst thing happened: less than one minute into the talk my mind went completely blank.

"I fiddled with the TV set for a while, then put it down, and eventually got back into it, only to notice the '20 seconds remaining' warning.

"I couldn't believe it and had to omit part of my talk and go straight to the finish. I honestly thought I had ruined my chances and was upset as I listened to the rest of the talks.

"There followed an incredibly nervous coffee break while the judges deliberated. I was truly surprised to be announced the winner and felt totally elated. I

skilled scientists who were all as eager as me to dispel the myth that science is too boring or difficult. I am actively involved in outreach at Sheffield University and hope to continue and expand my activities.

"The NESTA FameLab heat was an incredible day, exhausting yet inspiring, with excellent judges and a unique opportunity to meet like-minded scientists. When all seven finalists had been selected we were all invited to attend a weekend science communication master-class in Cheltenham. During the weekend we filmed and recorded video and audio podcasts, which were put on the Channel 4 website and voted for by the general public.

"We also took part in invaluable workshops to enhance our presenting skills. Our names were pulled out of a hat to decide the order of appearance in the final and I was pulled out first.

"The Cheltenham Science Festival took place during the first week in June and the FameLab final was the Saturday night finale. The day passed in a blur of rehearsing as well as seeing shows at the festival.

"During the run-through and sound checks I started to feel incredibly nervous. We had a warm-up session with our science communication trainer, Malcolm Love, and then I was on. There were a few minutes of film showing a clip of me from the heat and then my five minutes began. I talked about the Large Hadron Collider and the search for the origin of mass. "I could then relax while the other six finalists had their turn and then it was an agonising wait for the results.

"I was so thrilled to be runner-up. The winner, also a physicist, gave a fabulous show on the science of microwaves that went down very well with the audience. I was also lucky enough to win the audience vote for the audio podcast, which was on the subject of genetic engineering. Overall, the FameLab experience was an amazing opportunity to meet people in the world of science communication and perform science on stage and screen."

John Williams

"FameLab is the Pop Idol of science and a formidable way to break into the world of media and science communication, about which I am passionate."

to admit to being too nervous about the upcoming final to fully appreciate it. The standard of the talks in the final was outstanding. Unfortunately I can barely remember what the other people talked about as I was so focused on my own.

"I brought along a tiny TV set with which I would tune into some of the photons left over from the Big Bang, then talk the audience through the first three minutes of space and time, then fast-forwarding to the present-day cosmic microwave background. It was a lot to fit into three minutes. I was very pleased with my talk in rehearsal, as I felt it had the right mix of science and interest.

think it was the content of my talk that won the day, and also my passion for my subject that shone through.

"When Vivienne Parry, the *Tomorrow's World* presenter, gave me my ticket to the final I could not help but give her a huge hug.

"She told me that I had recovered like a true professional but advised me that in future not to rely so much on scripting my talk – feedback that I would work on for the final. I was ecstatic to be a NESTA FameLab finalist and eagerly awaited the final at the Cheltenham Science Festival.

"I felt so privileged to be among the company of such

Universities get in on the game

Yorkshire will be the home of the UK's first "game academy". The Game Republic Academy (GRA) has been created by some of the country's top video games developers and universities for computer games training.

Artificial Intelligence (AI) is now crucial to game development and courses offered at Yorkshire universities, supported by GRA, will offer gifted graduates appropriate courses in which to hone their skills.

Games industry leaders including Rockstar (famed for the hugely popular *Grand Theft Auto* series), Team17 and Sumo have teamed up with the universities of Bradford, Hull and Sheffield Hallam to provide these courses.

Screen Yorkshire, the regional screen agency, and Game Republic, the trade association for the games industry in Yorkshire, have committed £120 000 for GRA to run for two years, providing scholarship opportunities for people across the world to study for a master's degree in video-game development, alongside unique work experience opportunities.

Peter Cowling, professor of computer science at the University of Bradford, said: "We are delighted to be one of the three leading universities in the UK providing video games courses now in collaboration with the Game Republic Academy. We are exceptionally placed to offer students the kind of training the industry is



Computer games have come a long way since the arcade.

crying out for. With high-profile industry figures pointing towards AI as the next big thing for commercial games, we are able to offer our new AI for the games masters programme – the first of its kind in the world.

"Game Republic Academy's support will allow talented graduates from this programme to be part of the AI revolution in commercial games," he added.

GRA-affiliated companies such as Rockstar, will employ students during summer periods and allow them to carry out their final-year projects at their offices, giving them access to the companies' experience and equipment. The GRA will seek further links with industry during the next two years and it aims to win a further £30 000 of investment from games companies. It's a timely development for the

video games sector and follows calls from creative industries minister, Shaun Woodward for games academies to be set up in the UK. Speaking recently at the launch of the government's report into the performance of the country's creative industries, Woodward stated that video games are a hugely important part of the economy and that games academies would attract the talent that the UK needs to maintain its success as the largest European games-development community.

One of the key threats facing the video games business is a lack of suitably trained graduates. While there has been a proliferation of computer games courses in recent years, there is a worry throughout the industry that these are of unsuitable quality.

A career in games

development demands exceptional talent and such a highly technical skill set that a master's degree is vital, but students are often deterred by additional study, primarily due to high tuition fees.

The GRA removes these barriers by providing up to £3000 sponsorship per student and works closely with industry to ensure that the appropriate skills and knowledge are covered in the courses. Each institution also uses visiting lecturers from the industry. Jonathan Purdy, director of games studies at the University of Hull, said: "We are very pleased to be involved in the Game Republic Academy and are particularly pleased to have the support and backing of the games industry.

"This collaboration should ensure that the brightest talent is given the training and resources required to pursue a career in the computer games industry," Purdy said.

Students are invited to apply for the master's degree courses in artificial intelligence for games at the University of Bradford; games programming at the University of Hull; or entertainment software at Sheffield Hallam, which start this month.

For more information about artificial intelligence for games or other courses in the University of Bradford's School of Informatics, tel 01274 234 286, e-mail msc@inf.brad.ac.uk or visit www.inf.brad.ac.uk.

Award recognizes achievements of women in physics

The Women in Physics Group invites applications for an award. The prize is aimed at women at the start of their careers in physics who have made a substantial contribution to the subject and who may also have undertaken activities to support and encourage others in the field.

It is awarded annually to a woman who is within three years of completing her undergraduate degree in physics and who is either

working as a physicist or is engaged in postgraduate study.

The winner will receive £1000 donated by HSBC at a major Institute of Physics Women in Physics event and will also attend the annual HSBC Scholars' Day.

As well as providing recognition of the winner's work through the prize money, the award will provide valuable networking opportunities. Applicants must therefore be working in the UK or Ireland.

The Very Early Career Woman Physicist of the Year Award seeks to recognise the work done by physicists who are embarking on a career in physics and to promote the career opportunities open to people with physics qualifications. Further details and application forms are available at iop.org/activity/groups/professional/wip/index.html.

Please note that all entries must be received by 31 October 2007.

Got an idea for a branch event?

E-mail your suggestions to:

t.greenoughgraham@physics.org

Hemingway scoops award

In June, our chairman, John Hemingway, was awarded the UK Graduate Volunteer of the Year at a ceremony in Whitworth Hall, Manchester University. This is John's account of the experience.

My wife and I travelled to Manchester by train then spent an hour in Kendall's, a House of Fraser store, where we had an enjoyable lunch. Arriving at Whitworth Hall brought back memories of my graduation long ago, as that was the only other time that I had entered those hallowed precincts.

The hall was empty as we arrived but almost full for the ceremony, which began at 3.00 p.m. In due course I climbed the stairs, shook hands with three dignitaries, including the president, Prof. Alan Gilbert, and received my certificate, joining in a photo call with the president and other awardees.

Afterwards, I explained informally to Jane Ratchford, who was in charge, that I had long been grateful to the university for launching me on my career but now I could also be grateful to them for providing a brief moment of glory at the end of my career. I said that I valued the certificate greatly but could I be so bold as to enquire, where is the cash?

"We'll be in touch," replied Jane. "Our finance people will need an invoice from your chosen charity: we can't pay out without that," she added.

Of course, knew that the money generously sponsored by BP plc was to be paid to the charity of my choice, but I had fondly imagined that I might pick up a cheque on the day. Never mind, the fund will benefit in due course.

Voluntary work

What motivates one to volunteer? I think it is the feeling of a job well done that might not be done at all without voluntary involvement. It is good to take part and feel that one is making a difference.

Perhaps I am old and cynical, but I do believe that there is a lot



John Hemingway returned to his alma mater to pick up his award.

of selfishness around nowadays; one can even detect it in the driving habits of some people who are choking our roads with their gas guzzlers. However, they are the losers.

They do not realise how much enjoyment they are missing by failing to stop and think how they might help someone less fortunate. In the words of US President John Kennedy: "Ask not what your country can do for you—ask what you can do for your country."

My volunteering work has been very rewarding. It is good to see a successful conclusion after a long period of hard work.

The first public appeal I organised was for £600 000 to provide capital for the Rosewood Centre in Dewsbury—a day hospice for the care of terminally ill patients.

It started well but slowed halfway through, then the enthusiasm picked up again and there was a surge towards the end, meaning that we actually received £750 000 within the space of 18 months.

The centre was built and opened in 2000 by HRH the Duke of Gloucester. I recall mentioning in my speech that there had been some discussion over a name for the building and one of my colleagues suggested "the Dewsbury Dome"

because it was certainly a local millennium marker. However,

this was a "successful" project, so we chose Rosewood Centre as the name. The two local MPs who were in the audience laughed along with everyone else but I expect my little barb struck home.

My other voluntary work includes:

- President, Dewsbury Centre for the Deaf.

This is a figurehead position, although I do also attend management committee meetings on a regular basis.

The charity provides a building and services for profoundly deaf people who communicate with sign language.

- Chairman, director and trustee North Kirklees Crossroads Ltd.

This charity cares for carers by sending paid support workers once a week or fortnight and sometimes overnight into their homes to be with the person who is ill, so that the family carer can take time off. There is no charge for the service.

- Director and trustee, Spen Valley Forget-me-not Fund Ltd.

This charity supports ex-service personnel and their families using the income from a fund of more than £300 000 raised largely in connection with the two world wars, although its application is wider, including

Falklands veterans and many others. I help to manage the investments and visit some of the families.

- Rotary Club.

As a Rotarian I have taken part in many charitable activities including taking 60 special needs children on a summer outing to a theme park for a day.

- Chairman of the Yorkshire Branch of the Institute of Physics.

This speaks for itself and in that capacity I attend board meetings and the annual representative meeting, both of which are held at our London headquarters. It is instructive to see how the Institute operates.

I was invited to the Institute's Annual Dinner and set off by train, but the weather was so bad that we never arrived. The train stopped outside Peterborough station and then returned to Yorkshire, where we alighted seven hours after boarding, having drunk several gallons of free coffee but without arriving anywhere.

- Associate manager, SW Yorkshire Mental Health NHS Trust.

There is a small payment involved, so this is only voluntary in the sense that I can decide not to do it if I feel so inclined. I sit on a panel that considers appeals from patients who are not prepared to attend hospital voluntarily.

I find this work rewarding and worthwhile. Patients generally accept a decision made by the panel when it is explained to them, especially as we seek to give the explanation in an informal and sympathetic way.

It is good to see a patient recover from a spell of illness and go home, and some patients and/or relatives express thanks for the care provided, which is very satisfying.

John Hemingway

The Yorkshire Branch would like to congratulate John on his award and to thank him for all of the time and effort that he has put into branch activities.

Got an idea for a branch event? Let us know

Get clued up on cloud formation

This year's annual Leeds Astromeet will take place at the University of Leeds on Saturday 10 November.

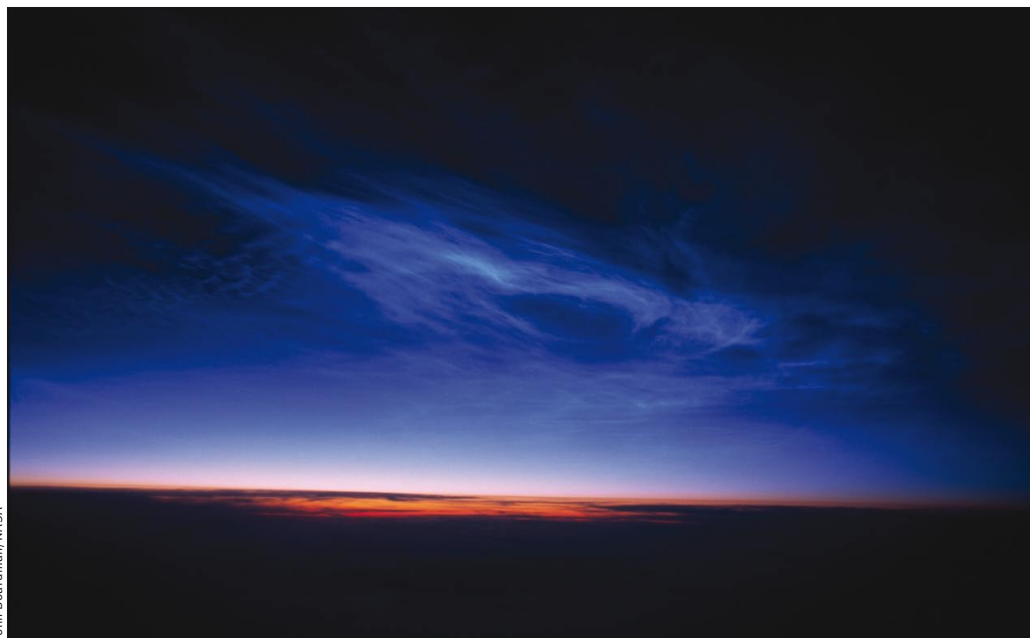
Sponsored by the Yorkshire Branch of the Institute of Physics, the event will include talks from some prominent names in astronomy as well as a trade fair, where you can start compiling your wish list of equipment and books.

Dr David Gavine will be presenting a talk on "Aurorae and noctilucent clouds".

Aurorae are familiar to most of us, even if we have never seen one in the sky with our own eyes, but noctilucent clouds (NCLs) are a less well known phenomena. These are formed in the mesosphere at very low pressure and look a little like high cirrus clouds.

However, a true NCL forms much higher in the atmosphere and can be seen only at twilight in the summer months when the sky is dark. Interest in NCLs has increased, because it is believed that they are getting brighter and more common. Scientists are now considering whether global warming and atmospheric pollution are affecting their formation.

Neville Maskelyne will be the subject of a talk by Dr Allan Chapman of the University of



John Boardman/NASA

Noctilucent clouds will be the subject of a talk at the annual Leeds Astromeet in November.

Oxford. Maskelyne was the fifth Astronomer Royal and is noted for his contribution to the science of navigation.

On his appointment, he established the publication of the *Nautical Almanac*, a compendium of astronomical tables to aid navigation. Lunar distances were calculated and published annually so that longitude could be calculated at sea. Maskelyne was an

advocate of lunar methods for establishing longitude and quickly became embroiled in the investigation into John Harrison's mechanical solution to the problem.

Dr Chapman's talk, entitled "Neville Maskelyne, the Astronomer Royal who opposed John Harrison", will examine the heated discussions that followed. Other talks during the event will include: "A history

and future of radio astronomy" by Prof Phil Diamond (Jodrell Bank); "An exploration of lunar volcanoes" by Prof. Lionel Wilson (University of Lancaster); and "The cosmic web" by Prof. Peter Coles of the University of Cardiff.

The event opens at 9.00 a.m. with the first talk at 10.00 a.m. and costs £10. For further details visit leedsastronomy.org.uk/

Time for new blood in branch – can you help?

A few committed individuals can do a lot but over time they can become a little stale. Our branch committee feels the onset of this phenomenon and wants to encourage new blood and new ideas. Will you do your bit?

The next opportunity will be at our Branch AGM in September.

Currently, the committee arranges a regular programme of free lectures in the universities of Hull, Leeds, Sheffield and York, plus occasional visits to places of interest. An annual prize is awarded in recognition of the best A-level student examination performance in Yorkshire. Committee

meetings are held in the physics department, University of York, on a monthly during term time at 5.30–6.00 p.m. and travelling expenses are paid from branch funds. The usual officers (chairman, secretary and treasurer) are required and other members undertake specific tasks, such as finding lecturers, editing *Yorkshire Physics News*, presenting the annual prize and making administrative arrangements.

The branch chairman attends quarterly meetings of the Nations and Regions Board at London headquarters and one of our current committee members sits on the Education Board, also at headquarters.

Travelling expenses and lunches are provided by the Institute of Physics on such occasions.

Naturally, we have a Branch AGM and dinner. Overall, it is just a small amount of time for each individual to commit and it can be very satisfying.

Life is what you make it. Whether you are just starting your career, are in mid-career or are at retirement stage, please get involved. If you feel unable to accept nomination yourself for any reason, ask your friend or colleague to accept.

The Institute needs active members. The more we do, the more physics and physicists will benefit.

Experienced members will offer assistance to anyone who feels the need for it.

Nomination forms are being sent out to all branch members and further copies can be obtained from our honorary secretary, Chris Butlin (16 Wheelwright Close, Sutton-upon-Derwent, York YO41 4JZ). If you want to talk about it, contact one of the officers: John Hemingway, chairman (tel 01274 878970; e-mail john.hemingway@btconnect.com); Chris Butlin, secretary (tel 01904 607169; e-mail ChrisAButlin@aol.com); or, Ian Jones, treasurer.

Remember: your Institute needs you.

Autumn's programme of events

SHEFFIELD PROGRAMME

Tuesday 9 October 2007 **Will the lights go out? Energy issues facing the UK**

Prof. Maxell Irvine (Department of Physics, University of Manchester)

5.00 p.m. Department of Physics and Astronomy, University of Sheffield

The world is seeing an unprecedented growth in the demand for energy at a time when many traditional sources are facing depletion and the changing geopolitical landscape is threatening the security of supply. It has also been argued that the overwhelming dependence on fossil fuels is promoting global climate change, with potential catastrophic consequences.

The talk will review the issues facing the UK against this global background. Topics to be considered include public concerns about the nuclear option, a realistic appraisal of the potential of renewable sources and timeframes.

Tuesday 6 November 2007 **Keeping time with a single ion** Dr Helen Margolis (National Physical Laboratory (NPL), Teddington)

5.00 p.m. Department of Physics and Astronomy, University of Sheffield

The past few years have seen enormous advances in the development of new types of atomic clock based on optical atomic transitions.

Such clocks operate at a much higher frequency than the current generation of microwave atomic clocks, so they divide time into smaller slices, and therefore offer the prospect of significantly better stability and accuracy. At NPL we are developing an optical clock based on an extremely narrow transition in a single trapped strontium ion.

Dr Margolis will describe how we observe a single ion, how we make a laser stable enough to probe the narrow clock transition and how we measure a frequency that is too high to

count directly. The applications of optical clocks range from improved satellite navigation to tests of fundamental physical theories.

Tuesday 27 November 2007 **Is there, or was there, life on Mars?**

Dr Mark Sims (Space Research Centre, University of Leicester)

5.00 p.m. Department of Physics and Astronomy, University of Sheffield

The talk will describe our current understanding of Mars and the conditions under which life can exist on Earth and might on Mars. Key results and images from recent robotic missions to Mars including the NASA Mars Exploration Rovers and Mars Express will be explained, along with a summary of the search for Beagle 2, and planned and possible future missions to Mars.

HULL PROGRAMME

Tuesday 2 October 2007 **Mind reading, mysteries and mathematics**

Rob Eastaway (president of the Mathematical Association)

7.00 p.m. Hardy Lecture Theatre 1, Hardy Building, University of Hull

From Uri Geller to Derren Brown, mind-reading has been captivating the public for generations. Some of the most mysterious mind-reading of all comes from the world of mathematics. In this talk, author and broadcaster Rob Eastaway will demonstrate and explain some of his favourite mathematical mind-reading tricks – some that date back to the time of Leonardo da Vinci. It will make you realise that some of the most wonderful mysteries are within everybody's grasp and have nothing to do with the paranormal.

Tuesday 6 November 2007 **The heat is on**

Prof. Howard Wilson (Department of Physics, University of York)

7.30 p.m. Leslie Downs Lecture Theatre, Ferens Building,

University of Hull

The scientific evidence that world temperatures are rising as a consequence of greenhouse gas emissions is now overwhelming. In the first half of his presentation, Prof. Peter Cox will review this evidence and describe the scientific basis for predictions of climate change during the next century.

The message is clear: we need to find ways to reduce emissions of carbon dioxide at a time when global energy demand is very likely to increase. In the second half of his presentation, Prof. Howard Wilson will explore the scientific challenges facing scientists who are striving to make fusion energy a reality, working with fuels on Earth that are 10 times the temperature of the Sun.

Tuesday 20 November 2007 **A recipe for the universe – in the beginning**

Dr Pete Edwards (Department of Physics, University of Durham)

7.30 p.m. Leslie Downs Lecture Theatre, Ferens Building, University of Hull

How and when did our universe begin? What made it look like this? How will it end? These are all questions that have preoccupied us since the beginning of civilisation.

The last three years have witnessed considerable progress in our understanding of what makes our universe tick. Recent results from ground and space-based telescopes have revolutionised our view of the cosmos.

The talk will take the audience on a journey through the cosmos, exploring some of the latest results from the world of astronomy and what they reveal regarding the birth, life and death of our universe.

YORK PROGRAMME

Monday 10 September 2007 **Yorkshire physicists reception** **6.30–7.30 pm Quarks restaurant, National Science Learning Centre, University Road, York**

As part of the BA Science Festival, the Yorkshire Branch

of the Institute of Physics is hosting a drinks reception to celebrate Yorkshire physicists and astronomers.

In particular, we will look back over our programme of blue plaques erected in the memory of famous physicists from our region. The evening will focus on John Michell, for whom a blue plaque is due to be unveiled on Saturday 8 September, as well as the life and work of Thomas Cooke the famous Yorkshire telescope-maker, who was born 200 years ago this year.

Monday 22 October 2007 **Earth – the only intelligent planet?**

Dr Simon Goodwin (Department of Physics, University of Sheffield)

6.30 p.m. Lecture Theatre P/L001, Department of Physics, University of York

The recent discovery of nearly 200 planets around other stars has stimulated interest in life on other planets and the possibility of intelligent aliens.

Dr Goodwin will argue that we are the only intelligent civilisation in our galaxy, and that several very special properties of the Earth and the solar system have made our planet unique.

Monday 5 November 2007 **Will the lights go out? Energy issues facing the UK**

Prof. Maxell Irvine (Department of Physics, University of Manchester)

6.30 p.m. Lecture Theatre P/L001, Department of Physics, University of York

The world is seeing an unprecedented growth in the demand for energy at a time when many traditional sources are facing depletion and the changing geopolitical landscape is threatening the security of supply. It has also been argued that the overwhelming dependence on fossil fuels is promoting global climate change with potential catastrophic consequences.

The talk will review the issues facing the UK against this global background.