



Eureka – Breakthrough & Development in Science

23rd July – 6th August 2014

LIYSF

London International Youth Science Forum

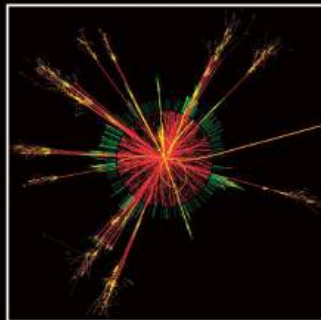
57th LIYSF: 22nd July - 5th August 2015

London International Youth Science Forum

Royal Parade Mews, Chislehurst, Kent BR7 6TN United Kingdom

T: +44(0)20 8295 8395 E: info@liysf.org.uk

www.liysf.org.uk



Picture courtesy of the Atlas Experiment at CERN. This track is an example of simulated data of a black hole, modelled for the ATLAS detector on the Large Hadron Collider (LHC). These tracks would be produced if a miniature black hole was created in the proton-proton collision. Such a small black hole would decay instantly to various particles via a process known as Hawking radiation.

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The London International Youth Science Forum

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HRH Prince Philip, Duke of Edinburgh OMKGKT, 1959-1969

Past Patron:

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President:

Prof. Richard O'Kennedy Dip FS BSc PhD C.Biol FSB FI.Biol.L (Ireland)

Past Presidents:

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The Rt Hon Lord Briggs 1983-1986
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Sir John Meurig Thomas FRS 1990-1993
Prof. Brian F G Johnson FRS FRSE FAcadEuropa 1994-2004

Chairman:

Mr Mike Clark

Conference Director:

Mr Richard Myhill (2009 - present)

Past Directors:

Mr Phillip S. Green MBE (1959 - 1963)
Mr George McGowan (1964 - 2003)
Mr John Needle (2003-2008) Associated with LIYSF since 1984

LIYSF Science Advisor:

Dr. Arthur Tarrant PhD FInstD FCIBSE FSLI CPhys CEng

Founded in 1959, LIYSF aims to give a deeper insight into science and its applications for the benefit of all mankind and to develop a greater understanding between young people of all nations.

LONDON INTERNATIONAL YOUTH SCIENCE FORUM
ROYAL PARADE MEWS
CHISLEHURST
KENT
BR7 6TN
UNITED KINGDOM

Web: www.liysf.org.uk E-mail: info@liysf.org.uk Tel: + 44 (0)20 8295 8395



The Prime Minister 2010 - Present



10 DOWNING STREET
LONDON SW1A 2AA
www.number10.gov.uk

THE PRIME MINISTER

July 2014

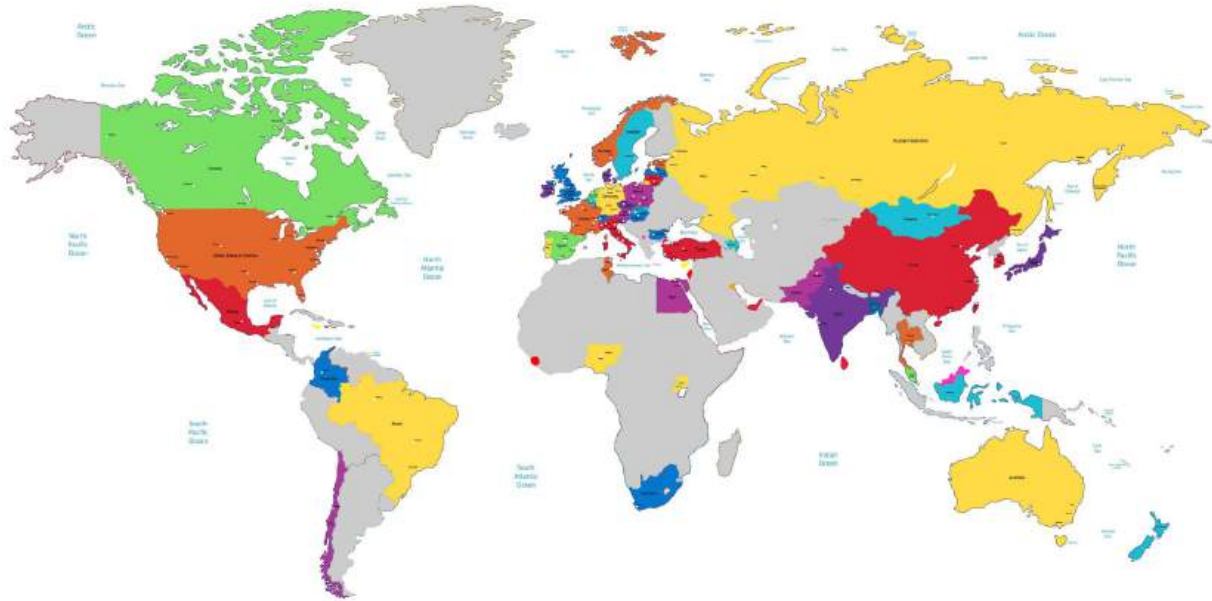
I am writing to welcome you all to the 2014 London International Youth Science Forum (LIYSF)

The Government strongly believes in the importance of mathematics, science and technology education. As technology becomes increasingly important and far-reaching, the demand for innovative technicians, engineers and graduates with strong science skills will grow.

Events such as the LIYSF 2014 that showcase these skills can only help support this. They inspire students to broaden their understanding of scientific needs and developments and progress further through engagement with fellow colleagues from around the world.

Please accept my best wishes for the success of the Forum.

Represented Countries



The following countries will be represented this year:

| | | | | | |
|------------|----------------|------------|------------------|--------------|-------------------|
| Australia | Cyprus | Indonesia | Malaysia | Russia | Thailand |
| Austria | Czech Republic | Ireland | Malta | Scotland | The Netherlands |
| Azerbaijan | Egypt | Israel | Mexico | Sierra Leone | Trinidad & Tobago |
| Bangladesh | England | Italy | Mongolia | Singapore | Tunisia |
| Belgium | Estonia | Jamaica | New Zealand | Slovakia | Turkey |
| Brazil | France | Japan | Nigeria | South Africa | Uganda |
| Bulgaria | Germany | Kosovo | Northern Ireland | South Korea | UAE |
| Canada | Guernsey | Kuwait | Norway | Spain | USA |
| Chile | Hong Kong | Latvia | Pakistan | Sri Lanka | Wales |
| China | Hungary | Lithuania | Poland | Sweden | |
| Colombia | India | Luxembourg | Portugal | Switzerland | |



President Professor Richard O'Kennedy



Biomedical Diagnostic Institute
Dublin City University
July 2014

It gives me great pleasure, as President, to welcome you to the London International Youth Science Forum (LIYSF) for 2014.

LIYSF is a marvellous opportunity to meet young scientists from all over the world and to discuss the latest developments in science. It provides the ideal venue to hear leading researchers discuss their work, its applications and its implications at a global level. The international nature of the Forum will give you the chance of learning about many different countries and their traditions. You will find that many of your ideas will be changed and you will become far more familiar with the world at large.

At the LIYSF, the lecture programme, seminars, visits, social events and interactions with other participants will significantly expand your knowledge, help to inform your future career choices and challenge your opinions. It is vital that you put great effort into being as involved as possible as that is the way to have a really beneficial and fun experience. You will find that science can provide many of the answers to the world's problems, but the solutions will demand active engagement from scientists, including you, to achieve the necessary outcomes for the good of humanity.

I am confident that coming on the Forum will be a wonderful experience and I look forward to meeting you.

Richard O'Kennedy
President, London International Youth Science Forum
Professor of Biological Sciences and Director Biomedical Diagnostics Institute, Dublin City University (DCU)

Conference Director Richard Myhill



In 1959, what was then called the 'Science Fortnight', began with the belief that "out of like interests, the strongest friendships grow", gathering students from a handful of European countries. Today in 2014, we hold the same belief, but have expanded somewhat, attracting 400 students from over 60 countries worldwide!

LIYSF has a full, rich and varied programme with incredible lectures and speakers, visits to world leading departments, debates and an engaging social programme. As Conference Director, it is my job each year to bring this all together. I work throughout the entire year, carefully managing all aspects and development of the Forum, to ensure that we fulfil and exceed the responsibility and expectations of our attending students, supporting organisations and governments. It is with great pleasure that I welcome you to London and hope that you have a wonderful time at the Forum.

Science Advisor - Dr. Arthur Tarrant



For the last three decades, LIYSF has been privileged to have had the unrivalled contribution and help of Dr. Arthur Tarrant. Initially, he came to deliver his amazing lecture demonstration 'Colour is Fun', but swiftly became part of the LIYSF 'family'. Over the years, his advice, both academic and practical, has been invaluable. His enthusiasm for LIYSF has been a vital part of the event for generations of Forum participants. Dr. Tarrant remains very active in maintaining the lecture: he is after all one of Britain's greatest experts in the field! We sincerely hope that he will continue to contribute to LIYSF for a very long time to come.

History

LIYSF was the brainchild of the late Philip S Green. In the aftermath of the Second World War an organisation was founded in Europe by representatives from Denmark, Czechoslovakia, the Netherlands and the United Kingdom in an effort to overcome the animosity resulting from the war. Philip decided to provide a coordinated programme on science with home to home exchanges between schools and communities. HRH The Duke of Edinburgh agreed to be Patron of the event and spoke at the first Opening Ceremony in 1959. Within a short period, interest in LIYSF spread across the UK and beyond Europe to the USA and Canada, and later across the five continents. As a result, the meeting gradually changed. Instead of being based on home to home exchanges, it became a residential meeting with its participants living in University Halls of Residence.

In the seventh decade of its existence the structure of LIYSF and its participation is constantly evolving, but our core principle remains. We pride ourselves in welcoming the best science students from across the world to participate in plenary lectures, seminars, visits to research establishments and cultural exchanges to put science into perspective and to encourage those attending to be aware of the needs of the world. For more information please visit <http://www.liysf.org.uk/liysf-history>.



Chairman Mike Clark



July 2014

LIYSF 2014 aims to explore the way that you as scientists develop novel solutions and approaches to important challenges.

Much scientific work draws directly on familiar accepted methods and theory; new methods and new theories can provide breakthrough solutions to problems that have frustrated scientists for generations. However, such innovations can have a positive and negative impact both in the academic and commercial worlds. We will consider how science manages, or should manage, the process of innovation to achieve the optimum benefits and how the solutions proposed can affect and be affected by ethical, economic, political, logistic and sustainability factors.

So our theme "Eureka! - Breakthrough and development in science" is particularly apt when daily we learn of breakthroughs across the scientific spectrum. Today, science is an international and inter-disciplinary activity. Originality must be correctly understood and managed, not only to gain acceptance within the scientific world, but also to ensure successful applications across all frontiers.

It gives me great pleasure this year, with over 400 young scientists from over 60 countries represented, to welcome you all to London to explore this theme. Your programme will include lectures from eminent scientists and researchers; with visits to some of the world's leading universities and research organisations, whilst enjoying a rich social programme.

The success of this year's Forum will occur through your energy, enthusiasm, questions and contributions, plus the friendships you will make here and what you will learn from each other amid the diverse cultures that LIYSF brings together.

A very warm welcome to London and LIYSF 2014.

Mike Clark
Chairman

The Agenda

| | | |
|---------------|---------------------|--|
| Wed 23rd July | 10.00hrs – 16.00hrs | Arrivals |
| | 19.30hrs – 20.30hrs | Welcome in Halls of Residence |
| Thurs 24th | 11.00hrs – 12.30hrs | LIYSF Opening Ceremony, Ondaatje Theatre - Royal Geographical Society |
| | | Key Note Address - Professor Peter Jenni Welcome Address - Professor Debra Humphris |
| | 15.15hrs – 15.45hrs | Programme Introductions. The Great Hall |
| | 15.45hrs – 17.30hrs | Lecture/Demonstration - Professor Richard O'Kennedy: 'Exploiting the Immune System for the Diagnosis of Cancer and Other Diseases' The Great Hall |
| | 17.30hrs – 18.30hrs | Sale of Optional Excursions. The Great Hall |
| | 20.30hrs – 23.30hrs | Welcome Party, Chelsea Old Town Hall |
| Fri 25th | 09.00hrs – 13.00hrs | Visits to Research & Scientific Establishments in London |
| | 14.00hrs – 17.00hrs | Lecture/Demonstration - Professor Dame Carol Robinson: 'Proteins in the Gas Phase - My Flexible Friends'. SAF Lecture Theatre |
| | 18.30hrs – 22.00hrs | The Science Forum Bazaar - Student Project Poster Board Evening Imperial College Atrium / Mechanical Engineering Foyer |
| Sat 26th | 10.30hrs – 12.00hrs | Lecture/Demonstration - Professor Murray Shanahan: 'Building Brains Using Computers'. The Great Hall |
| | 14.00hrs – 16.00hrs | Optional London Sightseeing Tour and London Eye |
| | 19.30hrs – 20.00hrs | European Patent Office Lecture Session - Lenora Reville: 'Learning About Patents'. The Great Hall |
| | 20.00hrs – 22.00hrs | Student Topics. The Great Hall |
| Sun 27th | 09.00hrs – 17.00hrs | Optional visit to Stonehenge & Salisbury |
| | 19.30hrs – 21.00hrs | Student Debate Evening, led by Prof. Averil MacDonald and Prof. Alun Vaughan: 'Will Women only Progress in Science if we have Quotas?' SAF Lecture Theatre |
| Mon 28th | 09.30hrs – 17.00hrs | Specialist Study Day: 'Breakthrough and Development'. Led by Sir Colin Terry SAF Lecture Theatre and Skempton Building |
| | 19.30hrs – 22.00hrs | Great Crossword Treasure Hunt. Queen's Lawn |
| Tues 29th | 08.00hrs – 18.00hrs | National Visits to Research & Scientific Establishments |
| | 19.30hrs – 22.30hrs | Optional Theatre night |

Principal Lectures and Demonstrations

Specialist Lectures

Visits



| | | |
|-------------|---------------------|---|
| Wed 30th | 10.00hrs – 12.00hrs | Specialist Lectures. Sir Alexander Fleming and Skempton Building |
| | 14.00hrs – 16.00hrs | Lecture/Demonstration - Professor Lesley Yellowlees: 'Powering Ahead with Solar Energy'. SAF Lecture Theatre |
| | 19.30hrs – 21.00hrs | British Council Lecture Session. SAF Lecture Theatre |
| Thurs 31st | 08.00hrs – 17.30hrs | Day Visits to Oxford & Cambridge Research and Scientific Establishments |
| | 19.30hrs – 22.00hrs | Rehearsals, Union Dining Hall, Student Union |
| Fri 1st Aug | 10.00hrs – 12.00hrs | Specialist Lectures. Sir Alexander Fleming and Skempton Building |
| | 13.30hrs – 15.00hrs | Lecture/Demonstration - Professor David Gems: 'Solving the Mystery of the Biology of Ageing'. SAF Lecture Theatre |
| | 15.30hrs – 18.00hrs | Visits to Science & Natural History Museums |
| | 20.30hrs – 22.00hrs | International Cabaret – Cultural Showcase Performance Evening Chelsea Old Town Hall |
| Sat 2nd | 10.30hrs – 12.30hrs | Lecture/Demonstration - Professor Keith Martin: 'A Vision of the Future: Using Science to Fight Blindness'. SAF Lecture Theatre |
| | 15.00hrs – 17.00hrs | LIYSF Olympics. Ethos Sports Hall |
| | 19.30hrs – 22.00hrs | Lecture/Demonstration - Professor Muffy Calder: 'Does Your System Behave as You Expect? From Bits and Bytes to Wet and Sticky'. SAF Lecture Theatre |
| Sun 3rd | 09.00hrs – 16.00hrs | Optional visit to Hampton Court Palace |
| | 20.00hrs – 22.00hrs | Traditions of Home – Sharing World Customs and Fashion Chelsea Old Town Hall |
| Mon 4th | 10.00hrs – 12.00hrs | Specialist Lectures. Sir Alexander Fleming and Skempton Building |
| | 14.00hrs – 16.00hrs | Optional Visits to State Rooms at Buckingham Palace and London Eye |
| | 19.30hrs – 22.30hrs | Optional Theatre Night |
| Tues 5th | 10.00hrs – 12.00hrs | Participant's Forum. SAF Lecture Theatre |
| | 14.30hrs – 16.00hrs | Lecture/Demonstration - Professor Sir Roy Anderson: 'Plagues and People' SAF Lecture Theatre |
| | 16.00hrs – 17.00hrs | Closing Ceremony. SAF Lecture Theatre |
| | 08.00hrs – 23.00hrs | Farewell Party. Chelsea Old Town Hall |
| Wed 6th | 08.00hrs – 10.00hrs | Departures |

Social Programme

Optional Visits

Opening Ceremony

Key Note Address



Professor Dr. Peter Jenni
Former ATLAS Collaboration Spokesperson
Albert-Ludwigs-University Freiburg and CERN

The Long Journey to the Higgs Boson and Beyond at the LHC

The recent experiments at the Large Hadron Collider have investigated particle physics at the highest collision energies ever achieved in a laboratory. Following a rich harvest of results for Standard Model physics, 2012 saw the first spectacular discovery, by the ATLAS and CMS experiments observing a new, heavy particle which is most likely the long-awaited Higgs boson. Other far-reaching results can be reported for exploratory new physics searches like Supersymmetry (SUSY), Extra Dimensions and the production of new heavy particles.

However, with this recent discovery of a heavy scalar boson the exciting journey into unexplored physics territory has only just begun at the LHC. Besides the first results and the future prospects, the talk will also touch on the history and the challenges of the whole LHC project.

Professor Jenni is one of the founding fathers of the ATLAS collaboration, which today comprises some 3,200 scientists in 177 institutions in 38 countries. In 2013 he received the High Energy and Particle Physics Prize of the European Physical Society and the Special Fundamental Physics Prize. Professor Jenni was elected for 14 years as the spokesman for the ATLAS collaboration. He has also received the Swiss Heinrich Greinacher Prize (1998), 1999, the Gold Medal of the Faculty of Mathematics and Physics, Comenius University, Slovak Republic, 2001, the "Memorial Silver Medal" the Charles University, Czech Republic, "Ernst Mach Honorary Medal of the Czech Academy of Sciences" (2012) and Julius Wess Award from the KIT Karlsruhe 2013.

Peter Jenni obtained his Diploma for Physics at the University of Bern in 1973 and his Doctorate at ETH Zurich in 1976. During 1978/9, he was a Research Associate at the Stanford Linear Accelerator Centre (SLAC), USA. He became a CERN research staff physicist in 1980 with the UA2 experiment (major involvement in the discoveries of the W and Z bosons). His strong interest was with the Large Hadron Collider (LHC) since the beginning in 1984. In 1995, after formal approval of the ATLAS experiment, he was elected its Spokesperson (project leader). He was re-elected several times, and retired from this duty in February 2009, retaining a strong involvement in the experiment. Since his retirement at CERN at the end of April 2013, he is an Honorary Professor with the Albert-Ludwigs-University Freiburg, Germany.

President's Welcome



Professor Richard O'Kennedy
LIYSF President
Dublin City University

Since 2009, Professor Richard O'Kennedy has been the academic President of LIYSF. Richard is Professor of Biological Sciences and Scientific Director of the Biomedical Diagnostics Institute at Dublin City University (DCU). He is former Vice-President for Learning Innovation in DCU, (since, Vice-President of the Institute of Biology of Ireland and represents Ireland and the Royal Irish Academy (RIA) on the Biosciences committee of the European Academies Science Advisory Council). He directs the Applied Biochemistry Research Group, internationally recognised for its expertise in antibody generation and immuno/ biosensor assay development, has published extensively (210 peer-reviewed papers, 25 reviews, 30 book chapters, 1 book and another in preparation) and has mentored 60 Ph.Ds to completion. He is a member of the Industrial Research and Commercialisation Committee at Enterprise Ireland, reviews for many journals/ international scientific bodies, edits three journals, has patents and licensed technologies/reagents and works closely with Irish/ international companies. He is a recipient of the Biochemistry medal of the RIA, President's awards for Teaching and for Research, the Fujitsu Innovation award and he coordinates the Masters in Biomedical Diagnostics which received the Outstanding Masters award in 2011. In 2014, he was elected to membership of the Royal Irish Academy.

Welcome Address



Professor Debra Humphris
Vice Provost (Education)
Imperial College London

Debra Humphris was appointed Pro Rector (Education) in October 2012 and in August 2013 became Vice Provost (Education). Prior to her appointment at Imperial College, Debra was the Pro Vice Chancellor (Education and Student Experience) at the University of Southampton since 2008. Professor Humphris was responsible for the creation, leadership and delivery of the University's education strategic plan, which emphasised enhancing the student experience and the importance of graduate employability.

Originally qualifying as a Registered Nurse, she later held positions as Senior Research Fellow at the South Thames Regional Health Authority, and at St George's Hospital Medical School. In 2003 she was appointed Director, Health Care Innovation Unit at the University of Southampton, after serving as Director of the New Generation Project since 2000. Professor Humphris is a member of the HEFCE National Student Survey Steering Group, HEFCE Financial Sustainability Advisory Group, the LERU Education Pro Rectors Group and the Russell Group PVCs Learning & Teaching.

Principal Lectures and Demonstrations

Thursday 24th July



Professor Richard O'Kennedy
Dublin City University

Exploiting the Immune System for the Diagnosis of Cancer and Other Diseases

The immune system plays key roles in detection of infections, destruction of disease-causing organisms and in fighting disease. We can exploit components of the immune system, such as antibodies, to diagnose and treat diseases such as cancer. Antibodies can be incorporated into sensors providing early diagnosis and, thus, better patient outcomes.

Specific case studies will be described and appropriate demonstrations will be included to show the applications of the associated technologies and how they will affect our health in the future.

Richard is Professor of Biological Sciences and Scientific Director of the Biomedical Diagnostics Institute at Dublin City University (DCU). He is former Vice-President for Learning Innovation in DCU, (since, Vice-President of the Institute of Biology of Ireland and represents Ireland and the Royal Irish Academy (RIA) on the Biosciences committee of the European Academies Science Advisory Council). Please see his full biography on the previous page.

Friday 25th July



Professor Dame Carol Robinson
University of Oxford

Proteins in the Gas Phase - my Flexible Friends

One of the most difficult properties to measure for protein molecules and the complexes they form is flexibility. This is because protein assemblies are often studied following their crystallization and in this state they lose their flexibility. Recent breakthroughs in our laboratory have shown that the flexibility of these assemblies can be explored in the gas phase, where protein molecules have the opportunity to move and express themselves in ways that are not possible in solution or solid states. This lecture will consider new possibilities for investigating the selectivity of proteins for lipids, drugs and other protein molecules.

Carol is a Royal Society Research Professor and Doctor Lee's Professor of Chemistry Elect at the University of Oxford. She is the first woman to hold a Chair in Chemistry at the University of Oxford and was the first female Professor of Chemistry at the University of Cambridge, completing her PhD there in two years. Following an eight-year career break to begin raising her three children, she returned to research at Oxford, later becoming a titular professor in 1999. In 2001, she moved to Cambridge to continue her research into mass spectrometry and was elected a Professorial Fellow at Churchill College Cambridge, a Fellow of the Royal Society in 2004 and a Royal Society Research Professor in 2006. In 2013, she was awarded the title of Dame Commander of the Order of the British Empire.

Saturday 26th July



Professor Murray Shanahan
Imperial College London

Building Brains Using Computers

Scientists approach the enormous challenge of trying to understand the brain in many different ways. One valuable tool is computer simulation. Drawing on the experimental data that neuroscience has built up over many decades, we can build computer models that simulate the way large numbers of neurons work together. In this talk, I will give a short introduction to how such computer models are built and will anticipate some future applications of this kind of research in medicine and artificial intelligence.

Murray Shanahan is Professor of Cognitive Robotics at Imperial College London. He graduated from Imperial in computer science in 1984 and obtained his PhD in computer science from Cambridge University (King's College) in 1988. Since then he has carried out work in artificial intelligence, robotics, and cognitive science. His work up to 2000 was in the tradition of classical, symbolic AI. But for the past decade or so he has turned his attention to the brain and its embodiment. His current interests include brain connectivity, neurodynamics, comparative cognition and the relationship between cognition and consciousness. His book "Embodiment and the Inner Life" was published by Oxford University Press in 2010 and he is currently working on a book about the technological singularity for MIT Press.

Saturday 26th July



Lenora Reville
European Patent Office

Learning about Patents

As students have creative minds and will inevitably arrive at innovative ideas, this lecture is aimed at describing one way in which to protect these ideas. This lecture will describe what a patent is and the purpose of a patent. The lecture focuses on awareness of patents and the important aspects to be considered by the inventor when deciding on applying for a patent, a crucial point being that the innovative idea is not disclosed publicly before applying for a patent.

Ms Reville is a Senior Patent Examiner at the European Patent Office. She joined the EPO in The Hague in 2000 upon graduating as an electronic engineer from University College Dublin. She works in the telecommunications field presently in power management of radio transmission systems and previously in optical transmission systems, corpuscular radiation communication e.g. quantum communication.

Principal Lectures and Demonstrations

Wednesday 30th July



Professor Lesley Yellowlees
University of Edinburgh

Powering Ahead with Solar Energy

In order to meet the ever increasing demand for electricity from an ever increasing global population it will be necessary to turn to renewable sources. One area where chemists can contribute effectively is in Solar Energy. The lecture will describe Dye Sensitised Solar Cells and the research we have undertaken in Edinburgh to characterise such cells using techniques such as uv/vis and epr spectroelectrochemistry.

Lesley Yellowlees is Vice Principal and Head of the College of Science and Engineering at the University of Edinburgh and is the immediate past president of the Royal Society of Chemistry. She became President of the Society in July 2012 and was the first woman to hold this office. Lesley completed both BSc in Chemical Physics and her PhD in Inorganic Electrochemistry at the University of Edinburgh. After completing research positions in Brisbane, Australia and Glasgow she returned to Edinburgh in 1986 and gained a personal chair in Inorganic Electrochemistry in 2005. Lesley completed five years as Head of the School of Chemistry at Edinburgh and Director of EaStCHEM in 2010. She was awarded a CBE in 2014 for services to science.

Wednesday 30th July



Dr. Claire McNulty
British Council

British Council Session

The work of the British Council will be showcased in this informative and entertaining session. One of the British Council's five charitable purposes is to encourage cultural, scientific, technological cooperation between the UK and other countries. The British Council supports science through STEM education initiatives; science and arts work; research partnership programmes; policy dialogues; supporting the capacity building of institutions; skills development and mobility of early career researchers.

Claire leads the BC Research Team, the 'Researcher Links' initiative and UK participation in the European Commission's 'Euraxess' initiative. Claire graduated in Chemistry and Biochemistry, Leeds University, completed her PhD in heart development, King's College London and did post-doc work at the Hubrecht Institute for Developmental Biology, The Netherlands. In 2008 she was appointed Adviser in Life Sciences and Science Policy, for the British Council and in May 2012 she was appointed to the Director of Science role. From September 2011 - May 2012 she also took on a part-time role at the Royal Society, as a senior science policy adviser.

Friday 1st August



Professor David Gems
University College London

Solving the Mystery of the Biology of Ageing

What is ageing? The received wisdom from medicine is that ageing is a natural and essentially benign process that brings life to a close and acts for the good of the species. Although, unfortunately, the ageing process is accompanied by diseases such as Alzheimer's and cancer, ageing itself is not a disease. But many scientists studying the biology of ageing, now view ageing as an entirely pathological process and therefore one for which treatments should be sought. Professor David Gems of the Institute of Healthy Ageing at University College London will discuss recent progress in research on the biology of ageing, including the causes of ageing and the development of possible treatments.

David Gems was a postdoc at the University of Missouri-Columbia USA before moving to University College London with a Royal Society fellowship in 1997, where he is now Professor of Biogerontology (the biology of ageing). Much of his work uses the worm *C. elegans* to understand the genes and mechanisms that control ageing. He has also contributed to studies of ageing in the fruitfly, the mouse and the parasitic worm *Strongyloides ratti*, and penned articles on the ethics of ageing research. He is a founder member and a Director of the UCL Institute of Healthy Ageing, and has contributed to some 90 research papers, review articles and book chapters.

Saturday 2nd August



Professor Keith Martin
University of Cambridge

A Vision of the Future: Using Science to Fight Blindness

Our understanding of the human eye has increased enormously over the last hundred years, yet numerous diseases remain the ability to deprive us of our most vital sense. Sadly, many people today remain blind with conditions that are easily treatable with access to appropriate healthcare. For other conditions we still have no effective cure. In this lecture, we will look at new technologies being used to restore vision in previously hopeless situations. So join us to see why the future might just be brighter for those who have lost their sight.

Keith Martin graduated from the University of Cambridge with First Class honours in Neuroscience in 1990 and trained in Clinical Medicine at the University of Oxford. He undertook further clinical and research training at the Johns Hopkins University, Baltimore, USA and at the Institute of Ophthalmology in London before returning to Cambridge in 2005. He has won several international awards for his work including the ARVO Translational Research Award 2010 and a Senior Investigator Award from the World Glaucoma Association in 2011. He was appointed as the first ever Professor of Ophthalmology at the University of Cambridge in 2010.

Principal Lectures and Demonstrations

Saturday 2nd August



Professor Muffy Calder
University of Glasgow

Does your System Behave as You Expect? From Bits and Bytes to Wet and Sticky

In computing science, we engineer systems to meet requirements. A major question for these engineered systems is: does the system behave as expected? This is important so we can trust them and use them as intended. In biological or evolved systems, we want to understand how a given system functions. This is reverse engineering. But the same question is still relevant: does the system behave as expected? This lecture will give an outline of how to apply techniques for modelling and reasoning about engineered systems, to evolved, biochemical signalling systems and how we might use the outcomes.

Professor Muffy Calder is Chief Scientific Adviser for Scotland and Professor of Computing Science at Glasgow University. In 2011, Professor Calder was awarded an OBE for services to Computer Science and a Royal Society Wolfson Merit Award. Professor Calder is chair of the EU Future and Emerging Technologies Advisory Group and also played a key role in establishing the BCS Academy of Computing as a partnership between UKCRC, CPHC and BCS. Before becoming Chief Scientific Adviser, she was a Royal Society Leverhulme Research Senior Fellow and Dean for Research in the College of Science and Engineering at the University of Glasgow.

Tuesday 5th August



Professor Sir Roy Anderson
Imperial College London

Plagues and People

The last few decades have seen the emergence and spread of a number of novel pathogens, including HIV, the SARS virus, BSE and the novel strain H1N1 of influenza A. The lecture will discuss the factors that promote the emergence and spread of pathogens with a special focus on our changing world. Many features of our globally connected world promote both emergence and spread of viruses, bacteria and other pathogens. These include, population growth, air travel, urbanisation and livestock production and sale. The lecture will also discuss how we currently plan to combat plagues with behavioural changes, drugs and vaccines.

Sir Roy is Professor of Infectious Disease Epidemiology in the School of Public Health, Faculty of Medicine, Imperial College London. His recent appointments include Rector of Imperial College London and Chief Scientists at the Ministry of Defence, UK. Sir Roy has also served as Director of the Wellcome Centre for Parasite Infections and the Wellcome Centre for the Epidemiology of Infectious Disease. He is the author of over 450 scientific articles and has sat on numerous government and international agency committees including the World Health Organisation and UNAIDS. He currently is a Trustee of the Natural History Museum and chairs the science advisory board of WHO's Neglected Tropical Diseases programme.

Sunday 27th July

Student Debate Session

Student Debate

Will Women only Progress in Science if we have Quotas?

Women remain underrepresented in science despite many initiatives to encourage them to apply to study and work in STEM areas. Progress is so slow in some countries that numbers of men and women in science will take 300 years to equalise at the current rate. Is it a fact that not many women want to study and work in science and many of these are not ambitious enough to progress to the top? Or is it important that more women do science and are promoted to the top? And if it is, should we have quotas for the number of women studying or working in certain STEM areas?



Professor Averil Macdonald



Professor Alun Vaughan

Professor Averil Macdonald

University of Reading

Averil Macdonald is Professor of Science Engagement at the University of Reading. She was awarded the international Bragg Medal and Prize by the Institute of Physics, London, the accolade of Woman of Outstanding Achievement in Science in recognition of her work in Science Communication, the prestigious Plastics Industry Award for Personal Contribution to the Industry and an Honorary Doctorate by the University of York. Averil is a Trustee of the Science Museum Group, sits on the STFC Advisory Panel for Public Engagement is a Director of the Cheltenham Festivals and sits on the Court of Imperial College. Averil chairs Forum for Physics in Society in the European Physical Society and sits on the EU Helsinki Group for Gender in Research and innovation.

Professor Alun Vaughan

University of Southampton

Alun Vaughan is Professor of Dielectric Materials and Head of the Electronics and Electrical Engineering Research Group in Electronics and Computer Science at the University of Southampton. Prof Vaughan is a Fellow of the Institute of Physics, a Fellow of the IET, a Senior Member of the IEEE and, in the past, has been a member of the Polymer Physics Group committee of the Institute of Physics and has chaired the Dielectrics Group of the Institute of Physics.

Monday 28th July - Breakthrough and Development Specialist Study Day

09.30hrs Sir Alexander Fleming and Skempton Building

Lecture A



Sir Colin Terry
Meggitt Plc

Mechanical Engineering

Sir Colin is a Chartered Engineer and was Chairman of the Engineering Council UK (2002-2005). In July 2004, he took over Chairmanship of Meggitt PLC, an international aerospace company in the FTSE 100, with revenue in 2012 of £1,700 million.

He has had wide experience in the public sector attaining the rank of Air Marshal (3 star General) and was Chief Engineer and Head of Logistics for the RAF with a budget of £2 billion, a workforce of 16000 based on 20 sites, responsible for over 1500 aircraft. He was a National Director of Engineering for Eurofighter and responsible for bringing the AWACS, Hercules 130J and Chinook Mk 2 into service in USA.

He is currently the Chairman of the Military Aviation Authority Safety Committee and a Director of Fox Marble. He has also advised HM Government at Cabinet level on key national and international initiatives. Sir Colin graduated in Aeronautical Engineering at Imperial College London, where he is a Fellow as well as a Fellow of the Royal Academy of Engineering. He has been a Council Member for Cranfield University, City and Guilds Institute London and Royal Aeronautical Society (and Chairman). A Deputy Lieutenant for Buckinghamshire, he is also President of the County SSAFA. He was awarded the KBE, CB and OBE (for services in the Falklands).

Lecture B



Professor Luke Alphey
University of Oxford

Genetic Control of Mosquitoes

Mosquito-borne diseases, such as dengue fever, chikungunya and malaria, are major and increasing international public health concerns. Modern genetics and synthetic biology can potentially provide new, precise, environmentally-friendly methods for controlling mosquitoes and other pest insects. Advantages and disadvantages of such methods will be discussed, including political and regulatory issues. In one version, called RIDL, engineered 'sterile' male mosquitoes (male mosquitoes do not bite or transmit disease) are released continually over a wide area to mate with the target pest population and thereby reduce their reproductive potential. Successful field trials in the Cayman Islands and Brazil validate the approach.

Professor Luke Alphey is a leader in the emerging field of genetic pest management. He is a director of Oxitec Ltd, which he co-founded in 2002 while at Oxford University. Oxitec successfully conducted the world's first outdoor experiments with a GM insect in the USA in 2006, and in 2010 showed that a wild mosquito population could be suppressed by a genetics-based method. Luke's early career focused on basic science, using *Drosophila* as a model system. Luke was selected as a Technology Pioneer of the World Economic Forum in 2008 and BBSRC Innovator of the Year 2014.

Lecture C



Dr. Denis Bona
Johnson Matthey Fuel Cells

Fuel Cells: How Can They Help in Leading to a more Sustainable World

The lecture is divided in four different sections. The first one explains what are fuel cells, how do they work and what are the applications. The second session focuses on the PEM fuel cell manufacturing process: from the raw material to the finished fuel cell power system. Then the third session shows the fuel cell market status: trends and perspectives. Finally, the last session is dedicated to the hydrogen production and hydrogen storage technologies and a further digression will describe a possible alternative energy infrastructure where fuel cells take their part in building a clean and sustainable future.

Dr Bona saw during high school a book named "The Hydrogen Economy" and from this he wanted to learn more about hydrogen and fuel cells. So, he built his first little reversible fuel cell and it worked. It was only a toy but when he showed it to his thesis tutor, she was so impressed that she wanted to introduce him to Electro Power Systems SpA. He started to work there before finishing university and his curiosity for trying to do new things helped him in developing the first company fuel cell stack. Denis progressed to become head of the company R&D team after 4 years. In the meantime he succeeded in and finished a PhD focused on the fuel cell durability and the fuel cell system components integration. Denis has now moved to Swindon (UK) where he works in Johnson Matthey Fuel Cells with a large team developing high performance fuel cell components for the future Fuel Cell Vehicle Cars.

Lecture D



Dr. Ellie Cosgrave
University College London

Liveable Cities: The Radical Re-Engineering of Cities for an Alternative Future

Urbanisation, climate change and the over-exploitation of natural capital are key drivers of change in cities. But what about wellbeing, social aspirations, the economy and political drivers? How do these factors affect our cities and how do they transform engineering practice? This session will explore the complex dynamics at play in our modern cities and question what alternative futures should or could be like. It will question our norms about the role of technology in creating cities and will explore how cities might be radically re-engineered to meet real human needs.

Dr Ellie Cosgrave is an Engineer and Research Associate at UCL where she works on the Liveable Cities research programme. Her research explores the radical re-engineering required to create cities of the future that deliver global and societal wellbeing within the context of low carbon living and resource security. Her Engineering Doctorate, sponsored by Arup was undertaken at the University of Bristol and explored how technology is transforming cities and the implications for city authorities across the world.

Monday 28th July - Breakthrough and Development Specialist Study Day

09.30hrs Sir Alexander Fleming and Skempton Building

Lecture E



Diana Duarte
**STFC Rutherford Appleton
Laboratory**

Seeing the Unseen: to the Limits of Ionising Radiation Detection

Several ground breaking scientific discoveries have at their heart the use of radiation, relying on radiation detection instrumentation for successful results. The LHC at CERN and powerful radiation beams such as those found in petawatt lasers and in synchrotrons have demanding operational requirements that need to be met by state-of-the-art radiation detectors. In this lecture, we will explore the radiation world: what is radiation, where can it be found in everyday life, where is it used and how is it possible to "see" something that cannot be seen, touched or sensed? What are the limits of detecting some as extraordinary as ionising radiation?

Diana is currently a Detector Scientist at the STFC Rutherford Appleton Laboratory in Oxfordshire while undertaking an Engineering Doctorate (EngD) in Micro and Nano-Materials and Technologies at the University of Surrey. After graduating in Nuclear Medicine and working in several European countries, she pursued her interest in radiation by taking an MSc in Radiation Detection and Instrumentation also at the University of Surrey. Diana works on improving the technology of semiconductor radiation detectors that have numerous applications in national security, space science, medical applications and science facilities.

Lecture F



Professor Clare Elwell
University College London

Shedding Light on the Human Brain

Innovations and breakthroughs in physics and engineering have led to a host of new technologies which are providing ever more detailed information about the human body in health and disease. Nowhere are these breakthroughs more exciting than in the field of brain imaging. Novel optical techniques are transforming the possibilities for when, where and how we image the human brain opening up whole new areas of research. This lecture will describe how optical brain imaging is transforming our understanding of the human brain with examples of projects investigating acute brain injury in critically ill patients, brain development in infants at risk of autism and the effects of malnutrition in rural Africa.

Clare Elwell is Professor of Medical Physics at University College London (UCL). She studied Maths, Physics and Chemistry at A level and was inspired to study Medical Physics by a lecture she attended at the London International Youth Science Forum. She went on to complete a BSc and MPhil in Physics with Medical Physics at Exeter University, and a Ph.D in Medical Physics at University College London. She leads an interdisciplinary research group developing novel optical systems for monitoring and imaging the human body, and in particular the brain. Her research projects include studies of autism, acute brain injury in adults, children and infants, sports performance, migraine, malaria and malnutrition. In 2012 she won the UCL Public Engagement award and has contributed to numerous science festivals, schools events and broadcasts.

Lecture G



Professor Cathie Martin
University of East Anglia

What can Plant Science Contribute to Healthy Diets?

This session will consider what parts of our diets come from plants a) directly b) indirectly. We will discuss what macronutrients, vitamins and micronutrients come from plants, and what happens if you have too much or too little of these different constituents and the experiments with model foods that define the activity of phytonutrients. How plant metabolism can be engineered to allow comparative nutritional assessment of different phytochemicals will also be considered.

Cathie is a group leader at the John Innes Centre and Professor at the University of East Anglia. Her interests span from fundamental to applied plant science. She researches into the relationship between diet and health and how crops can be fortified to improve diets and address the global challenge of escalating chronic disease. This work has involved linking leading clinical and epidemiological researchers with plant breeders and metabolic engineers to develop scientific understanding of how diet can help to maintain health, promote healthy ageing and reduce the risk of chronic disease. Cathie is also involved in genetic screens to identify crops which lack toxins that cause nutritional diseases. Cathie is Editor-in-Chief of *The Plant Cell*, through which she has been piloting new features in scientific publishing, including 'Teaching Tools in Plant Biology', a member of EMBO, AAAs, and she was recently awarded an MBE for services to Plant Biotechnology.

Lecture H



Professor Milo Shaffer
Imperial College London

Multifunctional Structural Power Materials

This lecture will consider using hierarchical composites to combine mechanical performance and electrochemical energy storage.

Milo Shaffer is Professor of Materials Chemistry at Imperial College London and co-Director of the London Centre for Nanotechnology. Notable recent work includes new, patented methods for the dispersion, surface functionalisation and characterisation of carbon nanomaterials, and new approaches to the synthesis of functionalised oxide nanoparticles in situ. In general, exploitation of nanomaterials is limited by difficulties in synthesis and processing, and research focuses on these problems. Milo has previously spent time working as a materials technology consultant in the areas of new technology development and exploitation, and holds around twenty patents, seven of which are licensed commercially. He has published over 100 peer-reviewed papers with a total of over 7000 citations, h-Index 41. He was awarded the Royal Society of Chemistry Meldola medal in 2005 and a prestigious EPSRC Leadership Fellowship in 2008. He sits on the RSC Materials Chemistry Division Council, and the editorial boards of *Chemical Physics Letters* and *International Materials Reviews*. He joined Imperial in 2003 from the University of Cambridge.

Wednesday 30th July - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture A



Dr. Daniel Amund
London Metropolitan University

Can Environmental Stress Affect the Functional Properties of Probiotic Bacteria?

Probiotics or "good bacteria" are commonly found in dairy products like yoghurt. Probiotics have been associated with various health claims, although how they work is still relatively unclear. Potential probiotic candidates should meet certain functional criteria. Among these, they should show potential to withstand stressful conditions in the gastrointestinal tract. This lecture will examine the effects of exposure to stress conditions on some desirable functional properties of Bifidobacterium, a type of probiotic bacteria, and the possible implications.

Daniel holds a BSc in Microbiology from the University of Lagos, Nigeria, and an MSc in Food Science from London Metropolitan University. He started his PhD at London Metropolitan University in 2010 on a Vice Chancellor's Scholarship. He was a postgraduate fellow at the Parliamentary Office of Science and Technology in 2013. He won first prize for his poster presented at the Society for Applied Microbiology Summer Conference in July 2013 and was selected to present a poster in the SET for BRITAIN poster competition at the House of Commons in March 2014. Daniel has recently been awarded his PhD for his research.

Lecture B



Jameer Emamally
Nuvia Group

Engineering our Lives

How do discoveries made today become tomorrow's reality? How does science move from the classroom to something you can touch and feel, or something that can help you solve a problem, investigate an idea, meet the needs of a city, a person or a company? This interactive lecture will give you an introduction to engineering and an awareness of the design process as we go on a brief journey to take an idea from concept to reality.

Jameer has a strong background in engineering and management, with a good track record of working in collaborative teams on both the national and international level. Jameer has project managed complex teams to deliver key submarine systems and has worked on a number of defence projects in various phases of the product lifecycle. During his career, he has worked in civilian and defence industries and across varying disciplines.

Lecture C



Dr. Matteo Guidotti
National Research Council, Italy

Heterogeneous Catalysis - Interior Design at Molecular Level

Nanochemistry is a scientific field in endless expansion. Chemists preparing heterogeneous catalysts are interior design architects "at nanometric level". The house is the porous solid material constituting the backbone of the catalyst. The furniture is the catalytically active site where the transformation of the reactants into products takes place. The use of the space corresponds to the study of the physico-chemical characteristics useful to tune and optimize the catalytic performance. The final users are the molecules diffusing in and out the nanometre-sized network of pores. Now the chemist can choose the best combination of parameters in order to design and develop the most suitable catalyst for a specific reaction.

Matteo studied in Milan where he received his Degree in Chemistry in 1997 and his PhD in Industrial Chemistry in 2000, with periods as visiting researcher in France, Russia, Spain and the Netherlands. His work deals with the study and development of heterogeneous catalysts for the synthesis of fine chemicals and the transformation of renewable raw materials. He is author of 87 scientific publications and some 100 communications at international congresses, Member of the Academy of Science of the Institute of Bologna, President of the Foundation for Scientific and Technical Education and Culture (Milan) and Deputy President of the Region Lombardy Branch of the Italian Chemical Society.

Lecture D



Dr. Ignacio Ferreras
University College London

Galactic Archaeology: Probing the Formation History of Galaxies Through their Stellar Populations

Galaxies are the "atoms" of the Universe. Made up of billions of stars bound by gravity, galaxies are separated from one another by vast distances, as if they were islands in a vast ocean. Their spectra encode a treasure trove of information about the properties of the underlying stellar populations. The presence of absorption and emission lines in the spectrum of a galaxy tells us about its past formation history. This area of astrophysics is the equivalent of archaeology, tracing the fossil record of structure formation and evolution. Over the years, observations of galaxy spectra have challenged the most advanced theories of galaxy formation. As surveys probe fainter and more distant galaxies, we are capable of exploring the formation process of the Universe over most of its cosmic history. This lecture gives an overview of this fascinating field of science.

Ignacio started his career in astronomy many years ago. As a child he was an active amateur astronomer and astrophotographer. After obtaining university degrees in theoretical physics in Valladolid, Spain and Cornell University, USA, he returned to astrophysics with a PhD in Cantabria, Spain, followed by various research and academic appointments at Oxford, ETH Zurich, University College London, and King's College London. At present, he is a reader in astrophysics at the Mullard Space Science Laboratory, UCL.

Wednesday 30th July - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture E



Dr. John Ingram
University of Oxford

Interactions between Food Systems and the Environment: a Two-Way Street

The session will cover the two-way interactions between human activities related to food security (in the context of the 'food system') and environmental conditions (in the context of 'planetary boundaries'). The seminar will highlight the range of ways our food system activities contribute to crossing the planetary boundaries and introduce some of the impacts of crossing these boundaries for food security. It will also examine options to adapt our food systems to changes in environmental parameters and to mitigate further deleterious changes; and how and why food security is - or is not - achieved.

John Ingram gained extensive experience working in East/Southern Africa and South Asia in agriculture, forestry and agroecology research projects. In 1991, he was recruited by the UK's Natural Environment Research Council (NERC) to help organise and coordinate research on global change and agroecology as part of International Geosphere-Biosphere Programme. In 2001, he was appointed Executive Officer for the international research project 'Global Environmental Change and Food Systems' (GECAFS). On the close of GECAFS, in 2011, he assumed a new role as 'NERC Food Security Leader', before joining the Environmental Change Institute, University of Oxford in 2013 to establish ECI's Food Systems Research and Training Programme.

Lecture F



Dr. Tom Ingram
Royal Shrewsbury Hospital

Is This My Heart?

In this lecture, we will examine one of the world's biggest killers - ischaemic heart disease, reflecting upon the evolution of our understanding of angina and heart attacks. We will join Mr Smith as he has his heart attack; looking at the pathology behind his presentation, the treatment which he receives and the complications which can occur. Then we will look to the future, on the one hand exploring the exciting therapies of stem cell transplantation and reperfusion injury limitation. However, an appreciation will also be given as to why, despite the significant advances we have made, the rate of decline in the incidence of heart disease has slowed and may even be on the rise again (especially in the young). The worrying prediction that this could be the first generation to be outlived by their parents should sharpen all of our minds as we enter an uncertain future.

Dr. Ingram graduated from the University of Leeds in northern England. He was selected onto the All Wales specialist training programme in Cardiology. Most recently, he has been awarded a three year competitive research grant from the British Heart Foundation to look into blood flow characteristics during times of reduced oxygen supply to the heart.

Lecture G



Del Stark
Del Stark Technology Solutions

Graphene and Advanced Materials: Changing the Future of Technology and the Employment Landscape

Graphene is a material that has been making headlines across the globe. Its many interesting properties are of huge interest to academic scientists and industrial companies. Graphene is extremely thin, stiff and strong, a conductor of heat and electricity and it is also ductile. Graphene has been portrayed "as a miracle material" that has the capacity to revolutionise many different industrial sectors such as flexible electronics and displays, energy storage and structural composites.

Del Stark is the CEO of Del Stark Technology Solutions, a company formed in 2011 to assist innovative and technically driven companies. Del has spent over 15 years providing technology solutions to industry as a nanotechnology consultant and technology scout. Del is an advocate for emerging technologies and a respected science communicator. Del was appointed the CEO of the European Nanotechnology Trade Alliance (ENTA) from 2005-2008, he returned to the IoN in 2008 and worked on many projects until 2011. Previous roles include Science Communicator at Glasgow University Science Technology Outreach Programme. Del has a B.Sc. Hons graduate in two degrees (Chemistry and Mathematics) from Regis University, Denver.

Lecture H



Dr. Ceri Brenner
Rutherford Appleton Laboratory

Pressing 'Fire' on the Most Powerful Laser in the World

This lecture will consider working with the most powerful and intense lasers in the world and their use to super-heat solid material to millions of degrees in less than a billionth of a second, driving it into the fourth state of matter; plasma. High energy plasma physics is a very broad area of research and has explorative as well as application-driven aspects. From helping us to understand extreme astrophysical events such as supernova explosions, to the pursuit for future, clean, abundant energy sources and next generation particle accelerator technology. So, what would YOU do with the most powerful laser in the world?

Dr. Ceri Brenner is a plasma physicist interested in both research and innovation. She works with the most intense and powerful lasers in the world to carry out high-energy plasma physics research as well as engaging with industry groups interested in accessing the facilities onsite at the Rutherford Appleton Laboratory in Oxfordshire for innovation development. Ceri is specifically interested in laser-driven, micron-sized accelerators as a compact technology for the next generation of particle and light sources with applications spanning medicine to manufacturing.

Friday 1st August - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture A



Professor Rhona Flin
University of Aberdeen

Safety at the Sharp End. Non-Technical Skills in High Risk Industries

Many safety-critical tasks are characterised by teams of workers dealing with significant risks, time pressure and increasingly complex technology. But what could possibly go wrong when there are experienced practitioners and reliable equipment? As major accidents have shown, such as two 747 jets colliding at Tenerife airport or the blow-out on the Deepwater Horizon oil rig, practitioners need to have non-technical skills, as well as technical proficiency. This lecture will consider how psychologists understand the importance of these skills from research conducted in the workplace, as well as in high-fidelity simulators.

Professor Rhona Flin holds the Chair of Applied Psychology and is Director of the Industrial Psychology Research Centre at the University of Aberdeen. She leads a team of psychologists conducting research on human performance in high risk work settings in healthcare, aviation and the energy industries. She is a member of the Safety Advisory Committee of the Military Aviation Authority at the Ministry of Defence. Her current research includes studies of non-technical skills for the oil, and gas industry, intra-operative decision making by surgeons and senior managers' safety leadership.

Lecture B



Huw James
To the Blue Group

Adventure Science

Humans have a very special relationship with our planet, our instincts are filled with curiosity and a thirst for knowledge. Exploring the globe takes time and preparation or we can easily be caught out in extreme conditions. But the pros, far outweigh the cons as we discover our dynamic planet. Scientist and Adventurer Huw James shows some of the amazing sights the Earth has to offer and how to see them without putting yourself in harm's way and the design and technology behind the kit that makes our exploration possible!

Adventurer and astronomer, Huw James is a presenter and active campaigner for public participation in science and the outdoors. He has brought his brand of energy and enthusiasm to hundreds of stage and screen appearances and can be seen performing at many of the science and outdoor festivals and events across the globe. Originally trained in space science and a fellow of the Royal Astronomical Society, Huw is an all-round athlete and adventurer. He combines these interests together to create his unique approach to engaging the public in the science of the universe and the adventure that is the natural world.

Lecture C



Dr. Ed Llewellyn
Durham University

Bubble, Bang, Burp! Big Experiments in Volcano Physics

Volcanic eruptions are spectacular, fascinating and diverse. Some produce explosions that blast many cubic kilometres of rock into the stratosphere and cause regional devastation. Others produce fountains and rivers of lava that create a dramatic natural tourist attraction. Many do no more than quietly release gas into the atmosphere. Despite this diversity of eruptive style, all volcanic eruptions are driven by the same fundamental mechanism - the formation and growth of bubbles of magmatic gas. So why do some volcanoes explode violently, whilst others bubble quietly?

WARNING: talk will include live volcanic eruption.

Dr Ed Llewellyn is a Senior Lecturer in Volcanology at Durham University and was a participant in LIYSF 1992. After reading Natural Sciences at Cambridge University, Ed undertook his doctoral research in Physical Volcanology at Bristol University. His research combines laboratory experiments, numerical modelling and fieldwork to understand how and why volcanoes erupt.

Lecture D



Dr. Mike Minett
University College London

Pain Genes: Exploring the Mechanisms of Pain Transduction

Over one-third of the world's population suffers from persistent or recurrent pain, costing the American public alone approximately £100 billion each year in health care, compensation and litigation. These pains can last for months or years and reduce the sufferer's quality of life immensely and can lead to secondary symptoms such as anxiety and depression. Our ability to treat these chronic pain states is currently limited, with treatment options that commonly trigger side effects.

Mendelian heritable pain disorders have provided insights into human pain mechanisms and suggested new analgesic drug targets. By focusing on these individual genes it is possible to dissect the mechanisms that contribute to chronic pain. Specifically targeting drugs against these key gene products may enable us to provide pain relief without affecting normal physiological functions.

Mike graduated in 2007 with a degree in Biomedical Science from the University of East Anglia, Norwich. He then worked for a Cambridge based biotechnology company. In 2008, he joined Prof. Wood's lab at University College London, working as a PhD student and has subsequently worked on projects there and at the University of Oxford.

Friday 1st August - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture E



Dr. Simon Morley
British Antarctic Survey

The Science of Climate Change in the Antarctic: a Marine Biological Perspective

This lecture will consider research in the Polar Regions from the perspective of a marine biologist, focussing on how the environment experienced by cold blooded marine animals has shaped their vulnerability to future climate. The extremely stable cold of the Southern Ocean has led to the evolution of many adaptations, including a reduced capacity to respond to elevated temperature. I will describe how our work has improved our understanding of the mechanisms underlying thermal tolerance and how this research will lead to better predictions of global patterns of biodiversity into the future.

Simon trained to be a marine biologist (BSc at Uni of Liverpool), fish biologist (MSc at Uni of Plymouth) and then a fish physiologist (PhD Uni of Liverpool). After a postdoc investigating the combined effect of temperature and oxygen on the life history of a bryozoan, he moved to the British Antarctic Survey in 2001. Simon has spent two full years as a fisheries scientist on the sub-Antarctic Island of South Georgia before concentrating on physiological studies of marine ectotherms on the Antarctic Peninsula.

Lecture F



Judith O'Toole
Mount Temple School, Ireland

Animals Don't Read the Text Books

In recent years, the veterinary world has provided us with many examples which illustrate how nature and science are constantly changing. The emergence of new diseases in recent years has shown us that we can never afford to become complacent, believing that if we know the facts of a subject today, we will know them tomorrow. This seminar will take a look at the history of veterinary medicine and explain how scientific advances have helped to reveal mysteries of the past. We will discuss the evolution of new pathogens, whilst also considering the understanding of certain diseases as merely a new way of looking at old information.

Judith graduated with a Degree in Veterinary Science (Bristol) in 1990. Judith worked as a veterinary surgeon until 1998. She obtained a Post Graduate Diploma in Education (UCD)1998, set up Diploma in Veterinary Nursing in UCD 2001-2003, teaching Science in Mount Temple Comprehensive School 1998 to present.

Lecture G



Professor Marcus Rattray
University of Bradford

Drugs on the Brain, the Brain on Drugs

Drugs have been used recreationally since the earliest history of mankind. Although many drugs are illegal and harmful, they are widely used and abused, especially amongst young people. In this lecture, Marcus will explore the world of drugs of misuse from a neurobiological and pharmacological perspective. What are they? How do they interact with the brain? Why do some people develop addictions? How can we best treat substance misuse?

Marcus Rattray is a Professor of Pharmacology and Head of the Bradford School of Pharmacy. He graduated with a BSc in Biochemistry at the University of Leeds followed by a PhD in Neuroscience at the University of London. After a postdoctoral research fellowship at the National Institutes on Drug Abuse in Baltimore, he became a Lecturer in Biochemistry and set up his own lab at St Thomas' Hospital, University of London, later moving to Guy's Hospital and joining the Wolfson Centre for Age-related Diseases in 2004. In 2008, he became Reader in Pharmacology at Reading School of Pharmacy before joining the University of Bradford in 2013.

Lecture H



Stacy Williams
HSBC

Being a Scientist in the Financial Markets

Scientists from a broad range of disciplines are an increasingly important force in the world of finance. The analysis of financial markets was once the preserve of economists but those with a scientific background have much to bring.

Global markets behave as a single, interdependent, highly complex system and the methods developed by scientists and engineers to model physical systems can be employed. In this seminar, we look at how complex systems techniques are used to gain deep insights into financial markets and how they can be applied to make better and more profitable investment decisions.

Stacy Williams is Head of FX Quantitative Strategy at HSBC. He is responsible for quantitative research and the development of novel mathematical techniques in finance. Stacy also supervises doctoral research in collaboration with the University of Oxford Centre for Industrial and Applied Mathematics (OCIAM).

Monday 4th August - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture A



Roma Agrawal
WSP Group

Engineering, The Shard and my Journey

The talk will cover Roma's journey into engineering, her career to date and why she believes that engineering is a rewarding career. The structural aspects of The Shard will be discussed; its design, construction and unusual features.

Roma is an Associate Structural Engineer at WSP. Roma has an MA in Physics from Oxford and an MSc in Structural Engineering from Imperial College. She was awarded 'Young Structural Engineer of the Year' and is an M&S Leading Lady. Roma was the only woman featured on Channel 4's documentary, 'The Tallest Tower'. Her career has been extensively featured in the media.

Outside work, she promotes engineering careers to young people and has spoken to over 3000 people at over 50 organisations in the last 3 years. She enjoys Indian classical, ballroom and latin dancing, yoga, reading and baking.

Lecture B



Maurice Brown
Utrecht University, The Netherlands

You Are Talking Air - The Impact of Hydrogen Fuel Technology on Our Future

The Hydrogen fuel cell has been around since 1839. This relatively obscure, but highly valued technology, played an important role in powering the United Space programme from the 1960's and still today. The technology holds great promise, as it presents a real alternative to fossil fuel energy. However, the industry will face a tough future. Promoters of this energy source must master the learning curve of the energy industry, if it is to become a feasible alternative. Hydrogen fuel cell technology has the potential to radically alter our energy landscape. How does this technology work, what are its applications and what problems does it face as an industry?

Maurice Brown was born and raised in Kingston, Jamaica, studying at Campion College and the College of Arts Science and Technology. He moved to the Netherlands in 1994 and completed his Bachelors degree in International Business Administration and Masters Degree in Business Management. He has a fascination for aviation and space exploration. He became a consultant to the aviation industry and later, held financial positions in various international companies. Currently, he is lecturer in Finance and Business Strategy at the University of Applied Sciences, Utrecht, (Netherlands) and is owner of a small company looking into promoting and exporting to developing countries.

Lecture C



Professor Roland Cliff
University of Surrey

Energy In The Low-Carbon World

Analysis of the global climate, summarised by the Intergovernmental Panel on Climate Change (IPCC), leads to the unavoidable conclusion that the climate is changing as a result of human activities. Applying the "contract and converge" principle provides a basis for estimating the extent to which each country should reduce its emissions of Greenhouse Gases (GHGs) to stay within the limit of GHG concentration in the atmosphere to avoid major "tipping points" in the global climate. Taking the UK as a specific case, this talk will explore what the future energy system must look like, including the possible contribution of renewable sources and the role of nuclear power.

Emeritus Professor of Environmental Technology and founding Director of the Centre for Environmental Strategy at the University of Surrey; previously Head of the Department of Chemical and Process Engineering at the University of Surrey; Visiting Professor in Environmental System Analysis at Chalmers University, Sweden; Adjunct Professor in Chemical and Biological Engineering at the University of British Columbia, Canada; formerly Executive Director and President of the International Society for Industrial Ecology; past member of the Royal Commission on Environmental Pollution, UK Ecolabelling Board and Science Advisory Council of Defra.

Lecture D



Dr. Rocio Diaz-Chavez
Imperial College London

Sustainability Assessment of Bioenergy Projects

Renewed interest in biofuels has been prices, energy security and the effects of climate motivated by different concerns such as high oil change. Though the use of biomass has many arguments in favour, the possible negative social and environmental implications obscure these positive possibilities.

To guarantee sustainability different mechanisms and tools need to be considered. The topics covered in the session will include; 1. How to assess the main sustainability issues addressed in the use of biomass resources for biofuels production 2. How bioenergy crops could contribute to improve agriculture, foster rural development and help improve local conditions in developing countries and 3. Environmental issues of bioenergy crops production.

Dr. Rocio Diaz-Chavez is a Research Fellow at the Centre for Environmental Policy of Imperial College London and MSc tutor for the Distance learning MSc of the Centre for Development, Environment and Policy at the School of Oriental and Asian Studies.

Monday 4th August - Specialist Lectures

10.00hrs - Sir Alexander Fleming and Skempton Building

Lecture E



Anna Hobbiss
Champalimaud Foundation,
Portugal

**Shaping Thoughts, Shaping Synapses:
Changing Connections Between
Neurons**

The brain has an enormous capacity to change throughout our lifetime. This enables us to form memories, learn new skills, and encode novel information, meaning we can adapt to the dynamic world we live in. These changes occur at the connections (synapses) between neurons, where different processes of strengthening or weakening allow the neural circuit to be modified. I will describe what we know about the biological underpinnings of these changes, and the current research I am undertaking as a graduate student to understand how the specific size and shape of these synapses affects and is affected by the activity in the neuronal circuits.

Anna is originally from Lancashire, UK. For her undergraduate degree, she studied Natural Sciences and Genetics at Clare College Cambridge, in particular studying non-canonical signalling pathways during fly development. She moved to Lisbon, Portugal in 2009 to join the Neuroscience Doctoral programme at the newly formed Champalimaud Foundation. Since 2010 she has been conducting her PhD studies in the lab of Inbal Israely, trying to understand how different types of activity delivered to neurons can change their structural and functional properties.

Lecture F



Dr. Simon Kyle
The University of Manchester

Waking up to the Importance of Sleep

In this talk Dr Kyle will give an introduction to the fascinating world of sleep research and outline the importance of sleep for health and wellbeing.

Dr Kyle is a Lecturer in the School of Psychological Sciences at the University of Manchester. He holds a Master of Arts (1st Class) degree in Psychology and PhD in Psychological Medicine (Sleep Disorders) from the University of Glasgow. He has particular research interests in the aetiology and treatment of chronic insomnia, and the impact of sleep and circadian rhythm disturbance in psychiatric and medical illness.

Lecture G



Dr. James Suckling
University of Surrey

**The Circular Economy and Resource
Efficiency within Consumer Electronics**

We are surrounded by mobile electronic devices and they have become an essential part of our lifestyle. Their rapidly changing specs encourage us to upgrade regularly, often with little consideration given to what happens to the old ones. But what impact does a buy/use/discard business model have on the environment and how can we best understand it? In this session we will explore what materials go into our electronics and why we need to keep a close eye on them. We will look at the tools that enable us to understand where our biggest impacts lie and how to mitigate them.

Dr James Suckling is a Research Fellow on the CLEVER (Closed Loop Emotionally Valuable E-waste Recovery) Project at the Centre for Environmental Strategy, University of Surrey. Originally completing a PhD in physics and then working in the consumer electronics industry as an R&D engineer/inventor at Sharp Laboratories of Europe, his research now focuses on the environmental impacts of portable electronic devices, such as mobile phones, tablets e-readers etc, and how they may be minimised through the development of product service systems and more effective recycling.

Lecture H



Dr. Liz York
University of Surrey

**Sustain Food Supply Chains:
are they Possible?**

Food is one of the most important aspects of human life. In the light of increasing environmental problems, there is now a pressing need to produce and supply safe and nutritious food in a sustainable way. Food supply chains tend to be long and complex, and therefore can easily be disrupted through natural problems (such as droughts) or human actions (for example, bio-terrorism). In this session, we will explore the complexity of food supply chains (for instance, production of a beef burger) and investigate the problems which prevent more robust system operation. We will also look at the motivations behind a variety of types of food scares and consider what we, as consumers, would want changed.

Elizabeth joined the Centre of Environmental Strategy at the University of Surrey in 2013. As a Research Fellow on the Evolution and Resilience in Industrial Ecosystems (ERIE) project, Elizabeth is exploring how better information transmission along supply chains might reduce food waste resulting from food "scares". She has previously worked on the FP7 project SmartAgriFood, looking at Internet technologies in the food supply chain. Elizabeth's PhD, "Greenhouse Gas Emissions from the Agricultural Soils in the UK and Abroad", was in conjunction with a Rural Economy and Land Use Programme "Local versus Distance; Comparative Merits of Consuming Vegetables Produced Locally to Overseas".

Scientific Visits

Friday 25th July

Visits to Research & Scientific Establishments in London

25/1 Imperial College London, Department of Chemical Engineering

See the laboratories, pilot plant and computing facilities of one of the UK's largest departments of its kind.

25/2 Imperial College London, Earth Science and Engineering

Research and teaching at one of the world's leading centres for the study of Earth Science (geoscience).

25/3 Imperial College London, Department of Life Sciences Biochemistry

One of the largest life science groups in Europe, research of full breadth of modern life science activity including, Molecular Biosciences; Cell & Molecular Biology and Ecology & Evolution.

25/4 Imperial College London, Department of Materials: Biomaterials in Regenerative Medicine

Research into biomaterials for tissue engineering and regenerative medicine; and bio-nanotechnology for nanostructures and create nano-biomaterials.

25/5 Imperial College London, Department of Mechanical Engineering, Energies Futures Lab

Imperial Racing Green is an undergraduate run project at Imperial developing electric, fuel cell and hybrid race vehicles. Interdisciplinary project involving 100 students from 6 departments within the faculty of engineering.

25/6 The Jodrell Laboratory at the Royal Botanic Gardens, Kew

World-famous centre for botanical research and study; includes a visit to the Jodrell Laboratory.

25/7 The National Physical Laboratory

UK's principal facility in measurement and materials science. Visit state of the art facilities ensuring accuracy, consistency and innovation in physical measurement.

25/8 The Old Operating Theatre and Herb Garret

Original Operating Theatre dating from 1821, with original instruments; find out about surgery before anaesthesia and antiseptics.

25/9 The Royal Institution - The Faraday Museum

The Royal Institution's collections began almost immediately after its founding in 1799 and include apparatus and manuscripts relating to some of the most significant scientific discoveries of the last 200 years.

25/10 The Tate - Conservation Department

Conservation scientists investigate artists' materials and techniques and study parts of the collection that are both difficult to conserve and poorly understood in terms of construction and materials. They also develop and provide analysis of materials to support conservation and collection-related activities.

25/11 University College London Hospital Trust - Blood Transfusion Laboratory

The laboratory issues approximately 50,000 blood and plasma products per annum, supporting the large Haemato-Oncology Department, a tertiary referral centre for the north west London area and the large Sickle Cell and Thalassaemia Unit which transfuses more patients than any other Trust in the UK.

25/12 University College London, Jill Dando Institute of Security and Crime Science

Visit the first Institute in the world devoted to Crime Science. Research is concentrated on new ways to cut crime and increase security.

25/13 London Wetland Centre

Over 100 acres of wetland sites, with extensive populations of wild birds, plants and insects. Talk to the experts about biodiversity and conservation.

25/14 Zoological Society of London (ZSL), Veterinary Dept.

Founded in 1826, the Zoological Society of London (ZSL) is an international scientific, conservation and educational charity whose mission is to promote and achieve the worldwide conservation of animals and their habitats. Their mission is realised through groundbreaking science and active conservation projects in more than 50 countries.

Tuesday 29th July

National Visit to Research & Scientific Establishments

29/1 Airbus UK

Core activities at Filton include the design, engineering and support for Airbus wings, fuel systems and landing gear integration.

29/2 Cranfield University

Cranfield University (a wholly postgraduate institution) has a global reputation for inspirational teaching and research, industrial-scale facilities and superior links with industry and commerce. From unique cabin evacuation research to finding life on Mars, from a frost blanket for racecourses to zero-emission cars, and from the next generation of anti-landmine devices to a new blood glucose monitor, Cranfield's focus is squarely on the application of its research.

29/3 University of East Anglia School of Pharmacy

The School of Chemical Sciences and Pharmacy was established in 2003 and was the first new school of pharmacy in the UK for 30 years. The therapeutic areas of cancer and inflammation are a major focus within the School.

29/4 The John Innes Centre, Norwich Research Park

An independent, international centre of excellence in plant science and microbiology working to generate knowledge of plants and microbes through innovative research to benefit agriculture, the environment, human health and well-being.

29/5 The National Oceanography Centre & University of Southampton's School of Ocean and Earth Science

NOCS is the national focus for oceanography in the UK with a remit to achieve scientific excellence in its own right as one of the world's top five oceanographic research institutions.

29/6 Meggitt Plc Aircraft Braking Systems Facility

The visit to Meggitt will showcase the company's capabilities in designing and manufacturing aircraft braking systems. Aircraft wheels, carbon-fibre brakes and high-technology anti-skid control systems are developed for safe, reliable performance in a very harsh environment.

29/7 Rolls Royce

Visit to see Rolls-Royce, from its beginnings to present day product range. See the largest collection of aero engines in the country, ranging from World War 1 era piston engines, the famous Merlin, right up to modern day jet engines.

29/8 The Rothamsted Research Centre

The longest running agricultural research station in the world, providing cutting-edge science and innovation, in areas of crop productivity and quality and sustainable solutions for food and energy production.

29/9 Syngenta's International Research Centre at Jealott's Hill

Syngenta is the world's largest agribusiness with 26,000 employees in 90 countries. With an 80 year tradition of innovation, Jealott's Hill is the company's largest site for new agrochemical R&D and product support. Key activities at Jealott's Hill include research into discovery of new active ingredients, new formulation technologies, technical support of our product range and Seeds research.

29/10 University College London, Mullard Space Science Laboratory

Exploiting the capabilities of rockets and spacecraft as platforms for scientific instruments it strives to understand our physical environment and our place in the Universe.

29/11 University of Kent, Electronics Laboratory

Design and research in electronics and digital multimedia equipment.

29/12 University of Warwick, Electrochemistry & Interfaces/ Electron Microscopy Dept

The application of electrochemistry to the understanding of fundamental and industrially significant interfacial chemical processes at the micro to nanoscale.



Thursday 31st July

Day visits to Oxford & Cambridge University Research Departments & Scientific Establishments

CAM/01 Cambridge Cancer Centre

The Cambridge Cancer Centre is a dynamic collaboration of researchers, clinicians, and the pharmaceutical and biotech industries based in the Cambridge area. We combine world-class science and technology with excellent patient care to pioneer new ways to prevent, detect and treat cancer.

CAM/02 The Cambridge Crystallographic Data Centre (CCDC)

The CCDC is a leading provider of structural databases and software for pharmaceutical discovery, materials development, research and education.

CAM/03 University of Cambridge, Earth Sciences Department

From geophysics and applied mathematics, geochemistry and sedimentology, petrology and volcanism, palaeontology and evolutionary biology, to the physics and fundamental properties of materials

CAM/04 University of Cambridge. NIHR Cambridge Biomedical Research Centre

A partnership between Cambridge University Hospitals Foundation Trust and the University of Cambridge. The partnership between the hospital and the university creates an environment where internationally outstanding biomedical and clinical scientists work alongside clinical practitioners to achieve translation of research for the benefit of patients.

CAM/05 University of Cambridge, Scott Polar Research Institute

The Scott Polar Research Institute was founded in 1920, as a memorial to Captain Robert Falcon Scott, RN, and his four companions, who died returning from the South Pole in 1912 and is the oldest research institute of its kind.

OX/01 Culham Centre for Fusion Energy

The UK centre for magnetic confinement fusion research and the home of the major European fusion experiment JET. It has a high technology incubator, Culham Innovation Centre and an technology transfer programme.

OX/02 University of Oxford, Botanic Garden and the Museum of the History of Science - Oxford

Houses the University's zoological, entomological and geological specimens. Among its famous features are a dodo, the first dinosaur to be scientifically described and the swifts in the tower.

The Museum of the History of Science houses an unrivalled collection of historic scientific instruments in the world's oldest surviving purpose-built museum building.

OX/03 University of Oxford - Department of Physics

Oxford Physics Department work on major facilities worldwide, develop the most advanced experimental techniques and the most sophisticated theoretical methods to investigate nature at every scale

OX/04 University of Oxford, Pitt Rivers Museum

The Pitt Rivers Museum cares for one of the world's great collections. It is equally famous for its celebrated displays and its leading role in contemporary research and museum curatorship.

OX/05 University of Oxford, Nuffield Department of Clinical Neurosciences & NIHR Biomedical Research Centre

NIHR drives progress on innovation and translational research in biomedicine into NHS practice and clinical research working to improve the understanding of the nervous system in health and disease.

Friday 1st August

Visits to Science & Natural History Museums

Natural History Museum

NHM's vision is to advance knowledge of the natural world, inspiring better care of our planet with the mission to maintain and develop collections and use them to promote the discovery, understanding, responsible use and enjoyment of the natural world. The 8-storey, landmark Darwin Centre and cocoon structure is the most significant development at the Natural History Museum since it moved to South Kensington in 1881. This dramatic new public space and state-of-the-art scientific and collections facility opens its doors to reveal a whole new Museum experience for visitors.



Natural History Museum

Science Museum

The Science Museum has over 300,000 objects in its care, with particular strengths in the history of western science, technology and medicine since 1700. It has been uniquely placed to acquire objects recording the Industrial Revolution and now holds unrivalled collections in this area. Medical artefacts from all periods and cultures also form an important part of its holdings.



Science Museum

Social Programme

There is an active social calendar with events designed to enable those from around the world to learn about different cultures.

| | | |
|-----------------|---------------------|---|
| Thurs 24th July | 20.30hrs – 23.30hrs | Welcome Party, Chelsea Old Town Hall |
| Fri 25th | 18.30hrs – 22.00hrs | The Science Forum Bazaar - Student Project Poster Board Evening Imperial College Atrium / Mechanical Engineering Foyer |
| Sat 26th | 20.00hrs – 22.00hrs | Student Topics. SAF Lecture Theatre |
| Mon 28th | 19.30hrs – 22.00hrs | Great Crossword Treasure Hunt. Queen's Lawn and surrounding South Kensington. |
| Thurs 31st | 19.30hrs – 22.00hrs | Rehearsals, Union Dining Hall, Student Union |
| Fri 1st Aug | 20.30hrs – 22.00hrs | International Cabaret – Cultural Showcase Performance Evening Chelsea Old Town Hall |
| Sat 2nd | 15.00hrs – 17.00hrs | LIYSF Olympics. Ethos Sports Hall |
| Sun 3rd | 20.00hrs – 22.00hrs | Traditions of Home – Sharing World Customs and Fashion Chelsea Old Town Hall |
| Tues 5th | 08.00hrs – 23.00hrs | Farewell Party. Chelsea Old Town Hall |

Optional Visits

LIYSF offers a varied programme of optional visits. On Thurs 24th July at 17.30hrs tickets will be on sale from LIYSF staff after the plenary lecture demonstration. Please see website for full details.

| | | |
|---------------|---------------------|---|
| Sat 26th July | 14.00hrs | London Bus Sightseeing Tour |
| | 14.30hrs | London Eye |
| Sun 27th | 09.00hrs – 17.00hrs | Optional visit to Stonehenge & Salisbury |
| Tues 29th | 19.30hrs – 22.30hrs | Optional Theatre night |
| Sun 3rd Aug | 09.00hrs – 16.00hrs | Optional visit to Hampton Court Palace |
| Mon 4th | 14.00hrs | Optional visits to State Rooms at Buckingham Palace |
| | 17.00hrs | London Eye |
| | 19.30hrs – 22.30hrs | Optional Theatre Night |

LIYSF Alumni Association

After your time at LIYSF stay connected with us and your new friends in our dedicated, LIYSF exclusive community.

The association is made up of people that are very passionate about the Forum. This association has been formed to help alumni of LIYSF stay in touch. We will be working hard in lots of way to keep the alumni information up to date. We are always looking for past participants that can help in our efforts and encourage you to contact us with any ideas or suggestions and photos from your time at LIYSF.



For more information please visit
<http://alumni.liysf.org.uk/>



Programme Venues

HALLS OF RESIDENCE



**Imperial College London
Southside Halls of Residence
Princes Gardens**

Hall Host: James North



**Imperial College London
Beit Halls of Residence
Prince Consort Road**

Hall Host: Hattie Jones

PROGRAMME VENUES



**Royal Geographical Society
Kensington Gore**



**Imperial College London
Sir Alexander Fleming Building**



Imperial College London



**Chelsea Old Town Hall
King's Road**



LIYSF Student Staff



Chief of Staff
Sean O'Callaghan
Ireland



Conference Assistant
Louisa Webb
England

Southside Halls of Residence

Beit Halls of Residence



Host
James North
England



Senior Programme Assistant
John Romero Tamayo
Colombia



Deputy Host
Abi Gilbertson
England



Chief of Counsellors
Belen Casanas
Spain



Counsellor
Ayush Prasad
England



Host
Hattie Jones
England



Senior Programme Assistant
Emmanuel Shofoluwe
England



Deputy Host
Gemma Prunes
Spain



Chief of Counsellors
Kyriaki Protopapa
Cyprus



Counsellor
Kayleigh Maxwell
Canada

Southside Halls of Residence Beit Halls of Residence



Counsellor
Lauren Fagan
Ireland



Counsellor
Marawan Ahmed
Egypt



Counsellor
Jacopo Franza
Italy



Counsellor
Xichen Jiang
China



Counsellor
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Nigeria



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Simran Mohnani
Malta

LIYSF Media Team



Senior Media and Communications Assistant
Deepesh Patel
England



Official LIYSF Photographer
Zach Cassar
Malta



Official LIYSF Reporter
Sai Maithili Jayanthi
England

Partners

Imperial College London

Imperial College London congratulates all participants on a successful 2014 London International Youth Science Forum.

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www.imperial.ac.uk/prospectstudents

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Supporting Organisations

LIYSF is very proud to have the support across the globe of; National Government Offices, British Council Offices, National and International Science Competitions, Science Organisations, Schools and Universities. We are truly grateful to all organisations for their work in nominating and supporting students to attend, a selection of them are shown here:

| | | | |
|--|-----------------|---|-------------|
| Academy of Sciences of Czech Republic | Czech Republic | M.K. Ammosov North Eastern Federal University | Russia |
| Akademeia | Poland | Marcellin College | New Zealand |
| Aprosllo Science High School Ventimiglia | Italy | Memorial University of Newfoundland | Canada |
| Aquinas College | New Zealand | Ministry of Education | Singapore |
| Beijing NGO Association for International Exchanges | China | Campion College | Jamaica |
| Binus International School Serpong | Indonesia | National Student Travel Foundation | Malta |
| British Council Bulgaria Branch | Bulgaria | National Youth Science Forum | Australia |
| British School of Brussels | Belgium | Pakistan Science Foundation | Pakistan |
| C.Génial National Competition - Sciences à l'Ecole | France | Pioneer School Of Ariana | Tunisia |
| Calouste Gulbenkian Foundation | Portugal | Polish Children's Fund | Poland |
| Campion College | Jamaica | RED Science and Technology Youth Activities Network | Mexico |
| Celia and Glyn Allen | Guernsey | Rede POC | Brazil |
| China Association for Science and Technology | China | Royal Society of Chemistry | England |
| Christ's College | New Zealand | Russian Youth Engineering Society | Russia |
| Dublin City University | Ireland | Society for Science & the Public | USA |
| Eskom Expo for Young Scientists | South Africa | St Julian's School | Portugal |
| Fallibroome Academy | England | The British Council School Madrid | Spain |
| FAST | Italy | The Cathedral and John Connon School | India |
| Foundation Jeunes Scientifiques Luxembourg (FJSL) | Luxembourg | The English School | Cyprus |
| Global Science Magazine Co | China | The GC School of Careers | Cyprus |
| Good Hope School Hong Kong | China | The Rotary National Science & Technology Forum | New Zealand |
| Institut Teknologi Bandung | Indonesia | The Weizmann Institute of Science | Israel |
| International Environment & Sustainability Olympiad | The Netherlands | Thomas Hardy School | England |
| John Roan School Greenwich | England | Tokyo Institute of Technology | Japan |
| Kuwait Science Club | Kuwait | Youth and Science Program | Spain |
| Lehigh University (Undergraduate Research Symposium) | USA | | |

Acknowledgements

LIYSF offers its thanks to all those who so generously assisted in the planning and preparation of LIYSF 2014 and, in particular, to:

The lecturers and speakers, whose contribution is invaluable.

The universities, industries and research centres for their generosity in hosting visits to their establishments.

The Government departments, schools, colleges, universities, educational groups, science competitions and foundations worldwide, which select and sponsor overseas participation, including: The European Commission, The British Council and The Royal Society of Chemistry.

Various individuals who provided much appreciated support and advice including, Mr John Needle, Sir Colin Terry, Professor Sir Roy Anderson, Dr. Tim Slingsby, Dr. Claire McNulty and Ms Annette Smith.

Imperial College London for not only providing facilities for all main sessions and accommodation, but also working with us across the University to integrate all aspects of the College with LIYSF.

The Royal Geographical Society and The Royal Borough of Kensington and Chelsea for providing programme venues.



Notes



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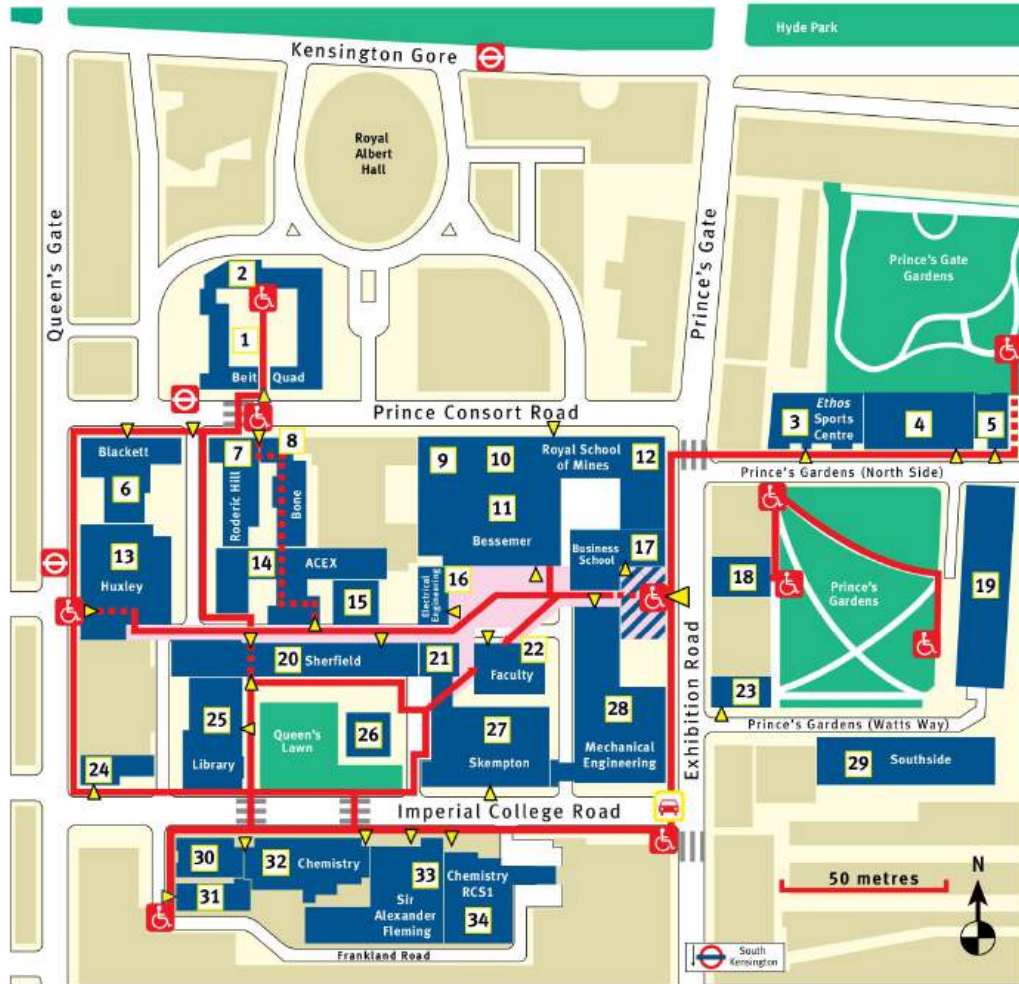


Notes



Notes

South Kensington Campus



Buildings where wheelchair access is not possible at this time

| | | | | | | | |
|----|---------------------------|----|---------------------------|----|--------------------|----|---------------------------------|
| 1 | Beit Quadrangle | 11 | Bessemer Building | 20 | Sherfield Building | 27 | Skempton Building |
| 2 | Imperial College Union | 12 | Goldsmiths Building | 21 | Student Hub | 28 | Mechanical Engineering Building |
| 3 | Ethos Sports Centre | 13 | Huxley Building | 22 | Conference Office | 29 | Southside |
| 4 | Prince's Gdns, North Side | 14 | ACE Extension | 23 | Climate Change | 30 | Wolfsen Building |
| 5 | Garden Hall | 15 | William Penney Laboratory | 24 | Faculty Building | 31 | Flowers Building |
| 6 | Weeks Hall | 16 | ACE Extension | 25 | 58 Prince's Gate | 32 | Chemistry Building |
| 7 | Blackett Laboratory | 17 | Electrical Engineering | 26 | 170 Queen's Gate | 33 | Sir Alexander Fleming Building |
| 8 | Roderic Hill Building | 18 | Business School | | | 34 | Chemistry RCS1 |
| 9 | Bone Building | 19 | 53 Prince's Gate | | | | |
| 10 | Royal School of Mines | | Eastside | | | | |
| | Aston Webb | | | | | | |