



London
International
Youth
Science
Forum

Energy -
The
Global
Challenge

28 July - 11 August
2010

The London International Youth Science Forum

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.

Founder Patron:

HRH Prince Philip, Duke of Edinburgh OM KG KT, 1959-1969

Past Patron:

HRH The Duke of Kent KG, 1983-1988

President:

Professor Richard O'Kennedy BSc PhD CBIol FIBiol FIBioll (Ireland)

Past Presidents:

The Rt Hon Lord Nathan 1959-1962

Sir John Cockcroft OM 1963-1967

Sir Lawrence Bragg CH FRS 1968-1969

Dame Kathleen Lonsdale FRS 1970-1971

Professor Sir Joseph Rotblat KCMG CBE FRS, 1972-1974

Professor Sir Hermann Bondi FRS FRAS, 1975-1979

The Rt Hon Lord Ritchie Calder 1980-1982

The Rt Hon Lord Briggs 1983-1986

The Rt Hon Lord Porter OM PRS, 1987-1989

Sir John Meurig Thomas FRS 1990-1993

Professor Brian F G Johnson FRS FRSE FAcadEuropa 1994-2004

Associates:

Dr. Hiskia Achmad ITB (Indonesia)

Celia Allen BA MIMgt

Sir Andrew Bowden MBE

Dr. Frances Calman MB BS FRCP FRCR

Helen Chambers BSc PGCE

Dr. Andrew Coates BSc MSc DPhil

Harry Cole CENG MIEE

Constantine Costa

Maurice Deloz

Dr. Alexis Dimaras PhD

Dr. Peter Douglas BSc PhD

Dr. Christopher Finn BSc (hons) MSc PhD

Dr. and Mrs Mike Gluyas

Dr. Arthur Tarrant PhD FlstD FCIBSE FSLL CPhys CEng

Dr. Albert Hudspeth

Dr. Cyril Isenberg BSc PhIP

Prof. Brian Johnson FRS

Prof. Rodney Jory Jp FAIP AM BSc PhD

Sr Dott Roberto Lenti

Prof. David Lowe MD FRCS FRCPath FIBiol

Prof. Trevor Letcher

Dr. Ricardo Marques da Costa

Jean Maudsley BSc PGCE

Prof. Gareth McKinley Ba Meng

Prof. Andrew Mills BSc PhD MRSC CChem

Jonathan Norgate MA (Cantab)

Prof. Richard O'Kennedy BSc PhD MIBiol DipFS DipC DipCS

Martin Perkins MA Cmath FIMA FRSA MRI

Prof. Sir John Meurig Thomas FRS

Prof. Viji Thambyraja BSc PhD LLB MHPEd FRSC CChem

Cbiol Mbiol AMIC

Prof. Neil Williams

The following countries will be represented this year:

Australia	England	Ireland	New Zealand	Spain
Austria	Estonia	Israel	Nigeria	Sweden
Belgium	France	Italy	Northern Ireland	Switzerland
Brazil	Germany	Jamaica	Norway	Thailand
Canada	Ghana	Japan	Poland	Turkey
China	Greece	Korea	Portugal	USA
Cyprus	Guernsey	Kuwait	Russia	Wales
Czech Republic	Hungary	Luxembourg	Singapore	
Denmark	India	Nepal	Slovakia	
Egypt	Indonesia	Netherlands	South Africa	

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

Web: www.liysf.org.uk E-mail: enquiries@liysf.org.uk
Tel: + 44 (0)20 8295 8395 Fax: + 44 (0)20 8295 8650



The Prime Minister 2010-Present



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

THE PRIME MINISTER

22 June 2010

Welcome to this year's London International Youth Science Forum.

Never has there been a greater set of challenges faced by the world: from climate change to global poverty; from national security to economic security.

And I believe passionately in the power of science and innovation to help us overcome each of them.

The theme of this year's Forum – 'Energy: The Global Challenge' – is a great example.

It will be the discoveries made by scientists – perhaps even some of you here – that will help to reduce our carbon emissions and reliance on fossil fuels.

So I hope that the Forum fires your imaginations.

Now in its 51st year, it is a unique opportunity for you to question experts, share your vision and ideas, and gain a better understanding of how science can benefit us all.

It is also a wonderful chance to challenge yourself.

With more than 300 participants from nearly 60 nations and a great range of social activities, you'll be able to learn huge amounts about other countries and cultures.

I hope you make new friends and leave with a determination to make a difference.

Best wishes

London International Youth Science Forum 2009 participants.



LIYSF Partners

**Imperial College
London**



Study London
www.study london.ac.uk
A world-class education in a world-class city



Arkwright SCHOLARSHIPS 1000



ZSL
LIVING CONSERVATION

LIYSF offers its thanks to all those who so generously assisted in the planning and preparation of LIYSF 2010, 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 schools, educational groups, science competitions and foundations worldwide, which select and sponsor overseas participation.

John Needle for his continued support, enthusiasm and consultancy in the preparation of the London International Youth Science Forum.

The schools, colleges and local authorities who nominate candidates from Britain to attend LIYSF and the industrial, commercial and charitable institutions who sponsor their attendance.

Imperial College London for working with LIYSF to provide its facilities.

The European Commission which sponsors the attendance of prize winners from the EU Contest for Young Scientists.

The British Council offices in Hungary, Slovakia and Thailand for their support and assistance, where participation is made possible through their involvement.

The George McGowan Memorial Fund.



Travel with a purpose
Specialists in quality bespoke group travel programmes to London, the UK, Ireland and Europe.

- School, youth and adult programmes
- Personal development and team-building
- Religious programmes
- Sports and activity programmes
- Special interest tours including music, drama and performing arts

Website: www.ecetravel.com
Tel: +44 (0)20 8295 8620
Fax: +44 (0)20 8295 8650
Email: enquiries@ecetravel.com

 
travel with a purpose



President
Professor Richard O'Kennedy



It gives me great pleasure, as President, to welcome you to the London International Youth Science Forum.

The Forum provides a marvellous opportunity to meet young scientists from many countries and cultures and many of the world's major problems will be examined and debated. New ideas, inspiration and innovative approaches to devise ways of overcoming our many scientific, social and economic problems are desperately needed. It is imperative that we work together because these issues are of global concern and cannot be resolved without worldwide collaboration and commitment.

At LIYSF you will learn a great deal from the lectures, seminars, visits and from the other participants. However, you will be constantly challenged in relation to your preconceived ideas about other people and cultures, encouraged to actively participate and perhaps you will find your true vocation for life.

So make sure you enjoy yourself but also make every effort to contribute. I am confident that coming on the Forum will be a wonderful, exciting and life-changing experience and I look forward to meeting you.

A handwritten signature in black ink that reads 'Richard O'Kennedy'. The signature is written in a cursive, flowing style.

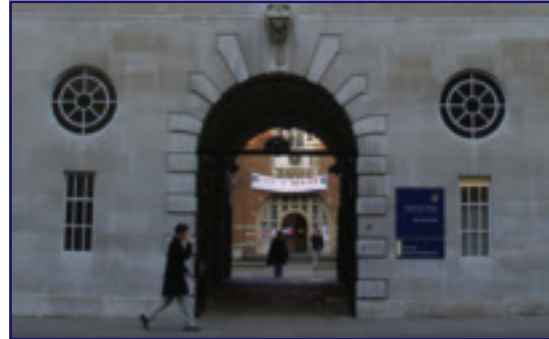
Richard O'Kennedy
President, London International Youth Science Forum
Vice-President for Learning Innovation and Professor of Biological Sciences
Dublin City University

HALLS OF RESIDENCE



**Imperial College London
Southside Halls of Residence
Prince's Gardens
London SW7 2AZ**

Hall Host – Ojali Negedu



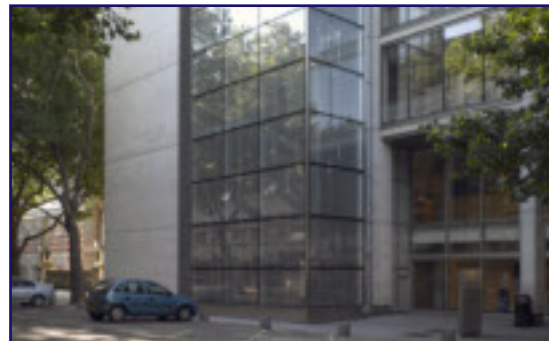
**Imperial College London
Beit Halls of Residence
London SW7 2AZ**

Hall Host – Joao Vicente

PROGRAMME VENUES



**Royal Geographic Society
1 Kensington Gore
London SW7 2AR**



**Imperial College London
Sir Alexander Fleming Building**



**Imperial College London
The Great Hall**



**Imperial College London
Queen's Tower Rooms**



Director of LIYSF
Mike Clark

LIYSF 2010 sets out to offer a broad spectrum of the sciences with the underlying theme of “Energy – The Global Challenge”. In a time when the gap between theories and scientific practices is ever decreasing, it is sometimes easy to forget how far we have come even in the last 50 years. Within all fields of science, the advancements and impact on mankind are critical. We all share the responsibility to balance scientific development with the world in which we live.

LIYSF provides a unique opportunity to share ideas with your student peers from around the world, to learn about different international scientific approaches and share in each other’s cultures. Make the most of every single opportunity over the next two weeks to learn, share and question everything about the scientific world and learn from each other.

Recently I have been privileged to have received letters and past programmes from a number of delegates who attended early LIYSF’s in the 1960’s. One message that has been consistent over the last 50 years is that attending LIYSF has had a major impact on the careers of our past delegates and friendships made at these events have been maintained for life.

You are in the heart of one of the world’s leading cities. You will meet fellow participants who are likely to become lifelong friends. It is these friendships that will bring LIYSF to life for you. Enjoy this year’s exciting LIYSF programme: in the lecture halls with our eminent speakers; visiting world class research establishments and organisations; enjoying our rich culture; and - last but by no means least - making new friends from the global science community at LIYSF 2010.

A very warm welcome to Imperial College London and LIYSF 2010.

A handwritten signature in blue ink that reads "Mike Clark". The signature is written in a cursive, slightly slanted style.

Mike Clark
Director of LIYSF

Principal Lectures and Demonstrations

Specialist Seminars

Visits

Social Programme

Optional Visits

WEDNESDAY 28TH JULY

Arrivals

Welcome and Orientation in Halls of Residence

THURSDAY 29TH JULY

10 15 Introductions, Programme & Health and Safety Briefing – Royal Geographic Society

11 00 Opening Ceremony – Royal Geographic Society

15 00 LECTURE/DEMONSTRATION: 'EXPLOITING ANTIBODY-BASED SYSTEMS FOR THE DETECTION OF CANCER AND OTHER DISEASES' – PROF. RICHARD O'KENNEDY

20 00 Welcome Party at Imperial College – The Great Hall

FRIDAY 30TH JULY

09 00 Morning Visits to Research and University Departments

14 30 LECTURE/DEMONSTRATION: 'CHEMISTRY AND LIGHT' – DR. PETER DOUGLAS

16 30 Sale of all optional excursions including theatre visits

20 00 The Science Forum Bazaar – SAF LT G16 Foyer

SATURDAY 31ST JULY

10 00 LECTURE/DEMONSTRATION: 'THE MAGIC OF SOAP BUBBLES' – DR. CYRIL ISENBERG

14 00 Optional Sightseeing Tour of London

19 30 Student Topics – SAF LT G16 Lecture Theatre

SUNDAY 1ST AUGUST

09 00 Optional Excursion to Stonehenge and Salisbury

20 00 The Great Crossword Treasure Hunt – Imperial College and surrounding area

MONDAY 2ND AUGUST

10 00 Specialist Lectures

14 30 LECTURE/DEMONSTRATION: 'THE WONDERFUL WORLD OF NANO-VERMICELLIS' – DR. JOACHIM STEINKE

16 00 Applying to a UK university session

20 00 Optional Theatre Visits

TUESDAY 3RD AUGUST

09 00 Day Visits to Research and Industrial Establishments

WEDNESDAY 4TH AUGUST

- 10 00 Managing the Warming World – Plenary Sessions and Discussion Groups
- 13 30 Reports / Plenary Session / Headline Theme Agreement
- 15 30 Final Reports / Plenary Session / General Discussion
- 20 00 LECTURE/DEMONSTRATION: 'VISION OF THE FUTURE' – DR. KEITH MARTIN

THURSDAY 5TH AUGUST

- 09 00 Day Visits to Oxford and Cambridge to include establishment visits and free time
- 20 00 Optional Theatre Visits

FRIDAY 6TH AUGUST

- 10 00 Specialist Lectures
- 13 30 LECTURE/DEMONSTRATION: 'COLOUR IS FUN' – DR. ARTHUR TARRANT
- 15 00 Afternoon Visits to Scientific Museums
- 20 00 International Cabaret at Imperial College Queen's Tower Rooms

SATURDAY 7TH AUGUST

- 10 30 LECTURE/DEMONSTRATION: 'THE CARBON NANOTUBE – TINY, BUT MIGHTY' – DR. SHANE BERGIN
- 15 00 Science Forum Olympics in Ethos Sports Hall
- 20 00 Songs of Home in Southside Common Room

SUNDAY 8TH AUGUST

- 09 00 Optional Excursion to Hampton Court Palace and Windsor
- 20 00 'At Home' in Southside Common Room

MONDAY 9TH AUGUST

- 10 00 Energy – The Global Challenge – Plenary Sessions and Discussion Groups
- 13 30 Reports / Plenary Session / Headline Theme Agreement
- 15 30 Final Reports / Plenary Session / General Discussion
- 19 30 Optional Theatre Visits

TUESDAY 10TH AUGUST

- 10 00 Participants' Forum
- 14 00 LECTURE/DEMONSTRATION: 'FUSION – POWERING THE FUTURE?' PROF. STEVE COWLEY
- 15 30 Closing Ceremony
- 20 00 Farewell Party at Imperial College Queen's Tower Rooms

WEDNESDAY 11TH AUGUST

Departures

Principal Lectures and Demonstrations

Key Note Address



Lord Browne of Madingley

*Energy, Environment and Expectations:
How science can help solve the world's
major challenges*

Energy is the lifeblood of society. During the 20th century access to affordable sources of energy underwrote one of the most remarkable periods of technological improvement and social progress in human history. But energy also has a dark side. Scientists now recognise that the manner in which it is extracted, processed and consumed is no longer sustainable. Our environment, our societies and our economic prosperity are all under threat if we collectively fail to solve the energy challenge. Science and technology has driven social progress; now it must fight a rearguard battle to protect its legacy.

Lord Browne was born in 1948, he joined BP in 1966, becoming Group Treasurer and Chief Executive of BP Finance International in 1984. In 1989 he became Managing Director and Chief Executive Officer of BP Exploration. He was appointed Group Chief Executive in 1995 and in 1997 of combined BP and Amoco group.

He is President of the Royal Academy of Engineering, and a Fellow of the Royal Society. He has been non executive director of Goldman Sachs, SmithKline Beecham, Intel Corporation and DaimlerChrysler AG. He has been trustee of The Tate Gallery and The British Museum. He was voted Most Admired CEO by Management Today from 1999 – 2002. He was knighted in 1998 and made a life peer in 2001.

Key Note Address



Professor Nigel Brandon FREng

Engineering a Sustainable Energy Future

Engineering and innovation sit at the heart of developing and deploying the next generation of technologies which can deliver a sustainable energy future. This lecture will explore the scale of the global energy challenge, and introduce some of the scientific and engineering concepts that are emerging and which have the potential to address the energy challenge related to ensuring safe, secure, affordable and sustainable energy.

Professor Nigel Brandon is Director of the Energy Futures Lab at Imperial College London, Senior Fellow to the UK Research Councils Energy programme, and UK focal point with China in climate change, energy and environment. His research interests focus on energy systems, and in particular those based around electrochemical power sources such as fuel cells and batteries. He was awarded the Royal Academy of Engineering Silver Medal in 2007 for his contribution to UK engineering leading to commercial exploitation.

Welcome Address



Professor Julia Buckingham DSc, FCGI, FSB

Julia Buckingham read Zoology at the University of Sheffield. She was appointed to the Chair of Pharmacology at the former Charing Cross and Westminster Medical School in 1987 and joined Imperial College in 1997, at the time of the medical mergers, where she had held the posts of Dean for non-clinical Medicine and Head of the Department of Neuroscience and Mental Health and is now Pro-Rector for Education and Head of the Centre for Integrative Mammalian Physiology and Pharmacology.

Throughout her career, Julia has been committed to supporting the broader aspects of academic life through work with the research councils, medical charities and learned societies. She is a former President of the British Pharmacological Society and is currently Chairman of the Society for Endocrinology and member of council of the newly formed Society of Biology. Her work has been recognised by the award of several prestigious prizes, most recently, as the first recipient of the AstraZeneca Women in Pharmacology Prize.

Thursday 29th July



Professor Richard O'Kennedy PhD, CBiol, FIBiol, FIBoll President of LIYSF

*Exploiting Antibody-based Systems for
the Detection of Cancer and other
Diseases*

Our immune system is one of the most powerful systems that we possess to combat disease. We can exploit components of this system e.g. antibodies, to develop highly sensitive and specific methods of detecting and treating cardiac disease, cancers, bacterial and viral infections, and a host of other pathogens.

To achieve this requires the input of multidisciplinary teams consisting of biologists, doctors, physicists, chemists, engineers, materials specialists, veterinarians, computing experts, nurses, sociologists, health-care workers and many more. Successful approaches must be clearly patient-focused, be economically practical and provide the necessary outcomes to improve our health. This lecture will give examples showing how this approach is necessary for the improvement of human health and welfare world-wide.

Richard is a Professor of Biological Sciences at the School of Biotechnology. He is also the principal investigator at the Biomedical Diagnostics Institute and Vice-President for Learning Innovation, Dublin City University.

Friday 30th July



**Dr. Peter Douglas BSc, PhD
CSci CChem MRSC ASIS
FRPS**
Assisted by Dr Mike Garley

Chemistry and Light

The aim of the lecture is to show the importance of photochemistry in our world.

We will look at how light is made: this serves to demonstrate how light can be generated electrically, thermally and chemically, and how visible light can be generated from ultraviolet light. We will also consider how light is used today in technology and everyday life, this includes its use in photography, electronics, entertainment, plastics, medicine and security. Finally, we will consider how light might be used in the future to solve two of the most important problems facing mankind i.e. the production of clean water and clean energy. The lecture ends with demonstrations illustrating ways in which light can be used to purify polluted water, and how sunlight can be used as the ideal non-polluting energy source by conversion into electricity or a chemical fuel.

Dr Douglas obtained his BSc in Chemistry from Newcastle University, followed by a PhD from University College London for research on solar energy conversion carried out at The Royal Institution under the supervision of Nobel Laureate George Porter. After a few years in the research laboratories of Kodak Ltd he joined the staff at Swansea University where he is currently a Senior Lecturer in Chemistry.

Monday 2nd August



Dr. Joachim Steinke

The Wonderful World of Nano-Vermicellis

Polymeric materials are ubiquitous and we encounter them in all parts of our lives. The type of encounter can range from the perceived mundane of a plastic bag or chewing gum to the apparently sophisticated nanotherapeutics or organic transistors. In the end it all comes down to the remarkable chemical and physical properties of long-chain molecules. This talk will present examples how the molecular properties of polymers are being harnessed to design and develop new materials to improve the quality of life.

Joachim Steinke obtained his first degree in chemistry from the Heinrich-Heine-Universität Düsseldorf, Germany and PhD in synthetic polymer chemistry at the University of Strathclyde, Glasgow. Afterwards he worked at Cornell University as postdoctoral fellow. In 1995 he took a lectureship at Cambridge University in the Department of Chemistry. Two years later he joined the Chemistry Department at Imperial College where he is now a Reader in Organic and Polymer Chemistry. His research interest is in the synthesis of new structural and functional materials for nanotechnological and biomedical applications.

Saturday 31st July



**Dr. Cyril Isenberg
Bsc, PhD, IIP
Department of Physics,
University of Kent at
Canterbury**

Magic of Soap Bubbles

Everyone has enjoyed blowing bubbles. The scientific and artistic communities have also been fascinated by films and bubbles, from nuclear physicists to cosmologists and from architects to artists.

This lecture will demonstrate, on a large scale, their vibrational properties, their equilibrium and non-equilibrium surfaces and their colours. Application to solving roadway problems will also be given.

Dr Isenberg is a solid state theoretical physicist. He gained his qualifications and early postdoctoral research experience at King's College, University of London. He subsequently worked as a resident research associate at the Argonne National Laboratory, near Chicago, Illinois, in the USA. However, most of his career was spent on the staff of the Physics Laboratory of the University of Kent at Canterbury, UK.

Wednesday 4th August



**Professor Keith Martin MA
BM BCh DM MRCP
FRCOphth
Professor of Ophthalmology,
University of Cambridge**

*A Vision of the Future: New Technologies
in the Science of Sight*

Our understanding of the human eye has increased enormously over the last hundred years, yet numerous disease processes retain the ability to deprive us of our most vital sense. Sadly, many people today remain blind with conditions such as cataract that are easily, quickly and completely treatable. In these cases, the problems are economic, political and logistic. For other conditions, however, we have no effective cure. When the optic nerve is damaged by trauma or severe glaucoma, the vital cells that connect the eye to the brain die.

In this seminar, we will look at new technologies being used to restore vision in previously hopeless situations. Recent successes in ocular gene therapy and also rewiring the optic nerve using stem cells will be discussed. Finally, we will explore some of the new generation tiny electronic devices that can now be used to replace a failing retina.

Keith Martin graduated from the University of Cambridge with First Class honours in Medical Sciences and Neurobiology and Oxford University Clinical School. He undertook three years of Research and Clinical Fellowship Training in glaucoma at the Wilmer Eye Institute, USA and at the Institute of Ophthalmology in London. He was awarded a Doctor of Medicine degree for his glaucoma research in 2004. Dr Martin established the University of Cambridge Glaucoma Research Unit and was elected Treasurer of the World Glaucoma Association in 2009 and is basic science Editor for the Journal of Glaucoma. In 2008, Dr Martin won the National Centre for Reduction, Replacement and Refinement of Animal Research Prize.

13 Principal Lectures and Demonstrations

Friday 6th August



Dr. Arthur Tarrant

Colour is Fun

In many industries the colour of a product is of vital importance. In digital photography and in transmission of colour images by various media, accurate reproduction of colour is essential. That means that we have to have ways of specifying and measuring colours. But how can you measure colour? It is not a physical quantity like mass or temperature – it is a psycho-physical phenomenon.

The lecture will explain basic principles of colour measurement and describe some of the many factors that affect the appearance of colours. Perhaps it will convey something of the delight of the scientist who works in this fascinating field.

Dr Tarrant studied physics at the University of London and first worked at the National Physical Laboratory. Later he worked at the University of Surrey. His main research has been on spectroscopy; daylight and the performance of optical instruments.

Saturday 7th August



Dr. Shane Bergin

The Carbon Nanotube – Tiny, but Mighty!

Carbon is the ultimate element: it is central to life and due to its special position in the periodic table a plethora of allotropes (diamond, graphite, etc.) are possible. Shortly after Carbon was brought into the nanoworld in the 1980s, the single-walled carbon nanotube (SWNT) was discovered – a cylindrical macromolecule with a diameter of around 1 nanometer – that's one billion times smaller than one metre! Scaling down to the nanoscale, the laws of physics that apply to our macro world break down acting as a massive challenge to scientists. The SWNT show incredible strength coupled with low density, are excellent thermal conductors and have a multitude of electronic configurations. Countless applications based on the properties of this wonder molecule have been envisaged: a lift into space, bullet proof vests as light as a T-shirt, and artificial muscles. In this talk you will be given an overview of the possibilities and the challenges in the field of carbon nanotubes and its nanomaterial cousins – a field encompassing physics, chemistry, engineering and biology – working together to understand and harness the potential of nanomaterials.

Dr Bergin received his undergraduate degree in Material Science and PhD in Physics at Trinity College in Dublin. He worked as a lecturer in the field of nanomaterials in Trinity College Dublin and recently moved to Imperial College London as a Marie Curie Research Fellow. As scientists, he believes we have a responsibility to share our work and knowledge with the public – this acts to inspire potential scientists.

Tuesday 10th August



Professor Steve Cowley

Fusion - Powering the future?

With fossil fuel reserves dwindling and environmental concerns over the emission of greenhouse gases, the search for alternative energy sources is becoming a prominent social issue.

A world-wide research programme is studying the viability of nuclear fusion – the process that powers the Sun – as a future energy source. The world's largest magnetic confinement fusion experiment and European flagship facility, the JET device, has been operating at the Culham Science Centre in Oxfordshire for twenty five years and has successfully demonstrated the fusion of Deuterium and Tritium ions, producing some 16MW of fusion energy. Whilst challenges remain to be overcome, fusion power offers the potential of almost limitless electricity with no greenhouse gas emission and short lived radio-activity compared to fission.

Professor Steve Cowley became the Director of the UK's fusion research programme at Culham Science Centre in September 2008. Having received his BA in Physics from Oxford University and his Ph.D. from Princeton University, Steve has worked on fusion research at Imperial College London, Princeton, Culham and UCLA. He is a Fellow of the American Physical Society and the Institute of Physics.

2nd August Specialist Lectures

10 00 - Sir Alexander Fleming Building

Lecture 2A



Dr. Simon Boxall

Green and Brown Energy From The Ocean

The world's oceans are one of the key sources of energy for our future. The vast majority of the remaining oil reserves sit below the deep sea bed, but recent events in the Gulf of Mexico have shown how perilous and costly this brown energy can be. What are the issues of such exploration and what is the true impact when accidents happen? The sea can also provide a greener source of energy but what are the realities of wave or tidal power? The lecture looks at options and considers how science can help provide solutions.

Dr. Simon Boxall is a lecturer in Oceanography at the University of Southampton, National Oceanography Centre (UK). He has worked on secondment for projects for UNESCO, The European Union Research Centre, The World Bank, The British Council, The Foreign and Commonwealth Office, and the European Space Agency. Current research varies from oil spills to coastal and fjord dynamics to climate change and the ocean. Simon has been involved in documentaries for C4, Sky, BBC, National Geographic and Discovery. He is the lead scientist for "Cape Farewell" working in the Arctic to highlight the pressing issues of climate change. Dr Boxall has recently initiated new projects focusing on a better understanding of our seas and the environment in India, South America and Russia.

Lecture 2B



Stacy Williams Bsc, Mphil

Did Financial Mathematics Cause the Credit Crunch?

The last decade saw an explosion in financial complexity, as increasing numbers of scientists turned their hand to finance. Suddenly the world changed.

The credit crunch hit in July 2007, leading us into the worst global recession the world has seen since the Great Depression. A great deal of blame has been directed towards the complex credit derivatives, and risk management techniques developed by financial mathematicians, in the years preceding.

Was too much complexity at the hands of the mathematicians really a major factor in the near collapse of the world financial system? This seminar looks at the role of Quantitative Finance during the financial storm and what the future holds for it as an applied science.

Stacy Williams is Head of FX Quantitative Strategy and is responsible for the development of HSBC's algorithmic trading platform, which provides optimised execution and smart order routing across the many electronic exchanges. Stacy supervises doctoral research in collaboration with the Oxford University Centre for Industrial and Applied Mathematics (OCIAM).

Lecture 2C



Dr. Robert Adam BA MB BS

Drugs, Dopamine and Impulsivity

Ever since humans first evolved, they have (unlike most other animals) sought pleasure or escape through the use of psychoactive substances. It seems that the neurotransmitter, dopamine, plays a vital role forming a common pathway in the neural circuitry for addiction.

In this seminar we will explore the many varied roles of dopamine so far known in the human brain - much of which we have learned through studying various conditions such as Parkinson's disease and schizophrenia. Then we will focus particularly on the role of dopamine in drug addiction. Finally, I will introduce the new field of neuroeconomics where it seems that dopamine may have a pivotal role in how we make decisions. We can begin to speculate as to whether the disruption of dopaminergic systems causes certain individuals to become addicted to drugs and/or make very poor decisions - whether as a result of drugs themselves or underlying disease.

Dr. Adam first attended LIYSF in 1994 and was subsequently a member of staff in 1995, 1996, 1997 and 2000. He studied pre-clinical sciences at Gonville & Caius College, Cambridge University. He completed his clinical medical training at University College London. He has specialised as a neurology and psychiatry resident at New York University Medical Center. He now studies impulsivity in a wide range of disorders, especially Parkinson's disease, using eye movements and will be submitting his doctoral thesis in 2010.

Lecture 2D



Judith O'Toole BVSc MRCVS, HdipEd

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) 1990, Judith worked as a veterinary surgeon until 1998. She obtained 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.

15 Specialist Lectures/Specialist Study Day

2nd August Specialist Lectures

10 00 - Sir Alexander Fleming Building

Lecture 2E



Dr. Tom Ingram MB, ChB, MRCP

Doctor... Is it 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 new 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.

Tom 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 2F



Dr. Graziella Branduardi-Raymont

Space Astronomy and the Exotic Universe

Scientists in virtually all branches of astronomy make use of instruments in space to learn more about the Universe. This lecture focuses on X-ray and gamma-ray astronomy, explains the basics of how observations are carried out in space, and describes some of the very recent results from the European Space Agency's (ESA) XMM-Newton observatory (the largest scientific spacecraft ever built by ESA) and the NASA Swift mission, dedicated to 'catching gamma-ray bursts on the fly'.

Graziella has more than 30 years experience in astronomy research from space; Co-investigator for the Reflection Grating Spectrometer flying on ESA's XMM-Newton observatory. Current research fields: X-ray properties of active galaxies and solar system objects.

4th August Specialist Lectures – Managing the Warming World Specialist Study Day

10 00 - Sir Alexander Fleming Building

Participants will work in their topic groups with their seminar leader to discuss their topic in relation to the theme and prepare a plenary report to present at the end of the day. This day will be moderated by Professor Chris France. Chris is an Electrical Engineer by training, but over the last 15 years has worked in the field of sustainability. Chris is Director of EPSRC and Director of Research for the Division of Civil, Chemical and Environmental Engineering.

Seminar 4A



Professor Chris France

Energy Production and Use

Chris has been an academic for some 20 years and currently works at the University of Surrey as Professor of Environmental Technology. He is an electronic engineer by training with degrees in instrumentation systems and a PhD in Optical Fibre Sensors. Over the last 15 years he has worked in the field of sustainability while it shifted from the preserve of 'tree huggers' to the more mainstream activity of today.

In 1993 he started an Engineering Doctorate (EngD) Programme in 'Environmental Technology' (which has trained over 120 students) and since 1998 has been a member (sometime Director) of Surrey's 'Centre for Environmental Strategy'. He is Director of one of the UK's largest Collaborative Training Grants (EPSRC - c£12M) which funds postgraduate research and training of relevance to industry and policy makers. He is Director of Research for the Division of Civil, Chemical & Environmental Engineering in the Faculty of Engineering and Physical Sciences and is one of three national Advocates for EPSRC's Industrial Doctorate Centres.

Seminar 4B



Dr. Rocio A Diaz-Chavez BSc, PhD

Agriculture for Food and Fuel

Renewed interest in biofuels has been motivated by different concerns such as high oil prices, energy security and the effects of climate change. Though the use of biomass has many arguments in favour, the possible negative social and environmental implications obscure these positive possibilities. The topics covered in this session will include the sustainability issues behind using biomass resources for biofuel production, the positive impacts of using biofuels and the environmental issues of bioenergy crop production.

Dr Rocio A 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 SOAS.

4th August Specialist Lectures – Managing the Warming World Specialist Study Day

10 00 - Sir Alexander Fleming Building

Participants will work in their topic groups with their seminar leader to discuss their topic in relation to the theme and prepare a plenary report to present at the end of the day. This day will be moderated by Professor Chris France. Chris is an Electrical Engineer by training, but over the last 15 years has worked in the field of sustainability. Chris is Director of EPSRC and Director of Research for the Division of Civil, Chemical and Environmental Engineering.

Seminar 4C



Dr. Steve Pedley

Water Management

The global rise in temperature that is predicted to occur over the coming decades will have far reaching consequences for many of the natural cycles that maintain our environment. In the opinion of many experts the water cycle is one of the most sensitive to temperature rise, with the result that some regions will experience significant increases in rainfall whilst others will become much drier. No matter what direction the amount of rainfall takes relative to current amounts, it will have significant impacts on the freshwater resources upon which we rely for domestic use, industry and agriculture. Using information about the design, construction, operation and maintenance of different facilities we will assess their relative vulnerability to climate change.

Dr Pedley is a microbiologist with over 25 years experience of research and consultancy work. For the past 13 years he has specialised in water quality, pollution control and public health.

Seminar 4E



Lauren Basson

Material Recovery, Re-use and Recycling

Lauren Basson is a lecturer in the Centre for Environmental Strategy where she co-ordinates the postgraduate module on Life Cycle Approaches. Her research focuses on supporting corporate and public policy decision making for Sustainable Development guided by Industrial Ecology principles. She is a co-investigator on the Engineering and Physical Sciences Research Council sponsored project "Evolution and Resilience of Industrial Ecosystems". Prior to working as a lecturer, Lauren worked as an environmental process engineer in an environmental consulting firm where she consulted principally to the mining, minerals processing and energy generation industries.

Seminar 4D



Emily Lewis-Brown

Marine Biodiversity

Emily Lewis-Brown is a natural scientist and conservationist. Specialising originally in dolphin research with Oxford University, she switched to work on climate change research and campaigning 10 years ago. Emily has worked extensively in the NGO sector, including 8 years with WWF where she initiated and led many research projects into the impacts of climate change on marine species and co-authored a publication on the impacts of the oceans on the climate. She is now based at the University of Surrey's Centre for Environmental Strategy, working for the Food Climate Research Network.

Seminar 4F



Alison Armstrong

Education and Social Change

Alison has a first class degree in Mathematics with Engineering. She worked for 5 years for a specialist engineering software company. Her specialism was supporting the aerospace and shipbuilding industries in Northern Europe and North America. She then worked in non-technical management and research for Airbus UK, facilitating the installation of the fuel system into a composite structure. She left the industry in 2006 to focus her attention on issues concerning sustainability. She completed a masters degree at the University of Surrey's Centre for Environmental Strategy, and is currently nearing the end of her PhD on behavioural change at the consumer level.

6th August Specialist Lectures

10 00 - Sir Alexander Fleming Building

Lecture 6A**Dennis Chen CFA CPL, BEng**

Telecommunications From the Past to the Future

Communication is one of the most basic needs in life. Communication can take many different forms - from touches and dance patterns used by the honey bee to highly intelligent whistles by dolphins and whales over vast distances. Our ancestors used smoke signals or drum noises to convey messages; but only in the last 100 years did improvement in technology bring about great advancement in both distance, speed and reliability. When the first submarine cable went into service, telegraphs were slow and expensive. Today, over 3 billion mobile phones are now in use and the number is growing by more than a million units every week. It is the fastest growing field of development in the history of mankind.

So what will be like in the next 50 years? Let's find out together.

Dennis graduated from University College London reading Electronic and Electrical Engineering and was a participant in 1994 and then a counsellor in 1995 and 1996. He has 10 years experience in Telecommunications as an engineering and financial consultant and now is a pilot with Cathay Pacific Airways on the Airbus fleet.

Lecture 6C**Dr. Helke Hillibrand**

Technological Roadmaps for Sustainable Agriculture

Agriculture is a key motor of global economic development. Over the past 25 years agricultural output has grown more rapidly than population, but the main challenge remains simultaneously to serve the growing demand for food, feed fuel and fibre in terms of quality and quantity. In the past, the Green Revolution has allowed for a quantum leap in agricultural production globally. However, further technological advancements will be needed in order to match the progress of the past, securing agricultural supply for a globally increasing demand, determined by consumer patterns shifting towards an even higher per capita demand for processed and refined agricultural products.

Helke is the Dean of Graduate Studies for the EMBL International PhD Programme. Helke studied Biology and Chemistry in Bochum and Paris and has 13 years of professional experience as a plant molecular biologist in the public and private sector. Previously Helke worked as a Senior Scientist, heading the enabling tool platform of BASF Plant Science Company.

Lecture 6B**Dr. Freya Blekman**

Research at the Knowledge Frontier: Particle Physics at CERN

CERN is one of the world's largest research laboratories in the world, with 10,000 scientists researching fundamental physics and the theory of structure of matter, space and time. We will look at the current problems and questions of fundamental physics – which we are currently trying to solve at CERN, using the Large Hadron Collider. I will focus on how the research done at CERN affects our understanding of the world around us, what it is like to be a particle physicist at CERN and how we interpret the collisions at the LHC.

Freya Blekman is a particle physicist specialised in the studies of top and quarks, the most massive particle currently known. Originally from Amsterdam, Freya received a Ph.D. at the Dutch National Institute for Particle Physics for work done at Fermilab, Chicago, USA. After having worked as a researcher for Imperial College she now works at CERN for Cornell University. In October 2010, she will become research professor of particle physics at the Vrije Universiteit Brussel (VUB) in Brussels.

Lecture 6D**Dr. Femke van den Berg**

Sustaining and Increasing Productivity while Minimising Adverse Effects on the Environment

Climate change and the increasing world population put an increasing pressure on agriculture to increase crop productivity whilst minimising its environmental footprint. With 160 years of experience, Rothamsted's scientific research ranges from studies of genetics, biochemistry, cell biology and soil processes to investigations at the ecosystem and landscape scale. Mathematics is increasingly recognised to be essential in developing effective strategies for preventing and controlling infectious diseases. Mathematical models can now predict the way plant diseases spread, where and when future outbreaks may occur and the evolutionary selection.

Dr. Femke van den Berg is a post-doctoral scientist at Rothamsted Research within the Department of Bio-Mathematics and Bio-Informatics and specialises in the evolution of plant diseases. Femke is also a national Science, Technology, Engineering and Maths (STEM) ambassador providing regular workshops and career seminars to local schools.

6th August Specialist Lectures

10 00 - Sir Alexander Fleming Building

Seminar 6E**Dr. Mark Wright***The Environment – Why Bother?*

The human population has doubled over the past fifty years at the same time as enormous technological change. The global environment is under more pressure than ever with greater demand on resources. As a result, we know we are losing some of our forests, climate change is becoming a reality and species are going extinct. But so what? Does it really matter if we have a few fewer trees or fewer living species? This talk will explore some of these issues and show that the environment is not just 'nice to have' but a critical prerequisite for the health of the planet and the welfare of our own species.

Mark began his career as an insect ecologist that took him to many parts of the world, including West Africa where he did his PhD on pests of cassava. He has also worked as a food aid advisor for Save the Children and a country director for VSO. He has been with WWF for seven years and currently works as their Science Advisor, with particular responsibility for programmes in Borneo and the Himalayas.

Seminar 6F**Dr. Denis Kramer PhD***The Science behind Materials for Batteries and Fuel Cells*

Batteries and fuel cells are key elements in any future energy scenario. Making them fit for the challenge is largely a quest for advanced functional materials. Therefore, Materials Science is at the core of finding better storage materials and advanced catalysts. We will look into processes at the atomic scale affecting the electrochemistry of materials and show how theory and experiment are going hand in hand to rapidly design better materials.

Dr. Kramer received a diploma in engineering from the Applied University of Sciences Zwickau (Germany) and holds a PhD from the Technical University Freiberg. He has worked as a research associate at the Paul Scherrer Institute (Switzerland) and research fellow at Massachusetts Institute of Technology (USA). Currently, he is a Research Associate at Imperial College London, focusing on predicting properties of nano-catalysts for fuel cells.

9th August Specialist Lectures – “Energy – The Global Challenge” Specialist Study Day

10 00 - Sir Alexander Fleming Building

Participants will work in their topic groups with their seminar leader to discuss their topic in relation to the theme and prepare a plenary report to present at the end of the day. This day will be moderated by Sir Colin Terry.

Seminar 9A**Sir Colin Terry KBE, CB, BSc(Eng), CEng, FEng, FRSA, FILog, FCGI, FRAeS***Mechanical Engineering*

This seminar study will focus on the current issues within the field of Mechanical Engineering, in relation to Energy.

Sir Colin has had a long career in the Royal Air Force, attaining the rank of Air Marshal and Chief Engineer (RAF), Head of Logistics and Commander in Chief of Logistics Command and was responsible for 15,000 personnel and 30 aircraft types.

Sir Colin is currently President of his College Association, and member of the Courts of Cranfield and Imperial College London, latterly where he obtained an Honours Degree in aeronautical engineering. Sir Colin Terry is the President of the Council of the Royal Aeronautical Society, Chairman of the Engineering Council and is a member of the Engineering Technology Board (ETB). Since July 2004 he has been chairman of Meggit plc, and as a Chartered Engineer, advises several international aerospace companies.

Seminar 9B**Maurice Brown***Hydrogen Cell Technology*

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 1960's and still today. The technology holds great promise, as it presents itself as a real alternative to fossil fuel energy.

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 where he completed most of his formal education 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 a Masters in Business Management.

Currently he is lecturer in Finance and Business Strategy at the University of Applied Sciences in Utrecht, The Netherlands and is owner of a small company looking into promoting and exporting to developing countries, which support a sustainable future for our planet.

9th August Specialist Lectures – “Energy – The Global Challenge” Specialist Study Day

10 00 - Sir Alexander Fleming Building

Participants will work in their topic groups with their seminar leader to discuss their topic in relation to the theme and prepare a plenary report to present at the end of the day. This day will be moderated by Sir Colin Terry.

Lecture 9C



Dr. John de Mello

Nano Technology

Dr. John de Mello is a Reader in Nanomaterials in the Department of Chemistry at Imperial College. His research focuses on the experimental and theoretical characterisation of nanoparticles and molecular semiconductors with particular emphasis on their use in optoelectronic devices. He has published over 60 papers and 3 patents and was a co-recipient of the Royal Society's 2007 Brian Mercer Award for Innovation in Nanotechnology. Dr. de Mello currently holds a Royal Society Industry Fellowship with Millennium Inorganic Chemicals, and is a co-founder of Molecular Vision Ltd. - an Imperial College spin-out specialising in the use of organic LEDs and photodiodes for chemical sensing.

Lecture 9E



**Emeritus Professor
Keith Barnham**

Photovoltaics

This topic will consider solar energy: the energy which powers evolution. Also considering photovoltaics; the fastest growing renewable energy source world-wide. We will look at how a solar cell works and the three generations of solar cells. We will also think about the applications of PV and the future solar revolution.

Keith Barnham is Emeritus Professor of Physics at Imperial College. His early research career was in Experimental Particle Physics at Birmingham University, CERN Geneva, Berkeley California and Imperial. In the 1980's he changed his research field to the study of photovoltaics (solar cells), spending a year as a Royal Society/SERC Industrial Fellow at Philips Research Laboratories. On returning to Imperial he co-founded the Quantum Photovoltaic group. He has co-founded two solar cell companies. One of these, QuantaSol Ltd, achieved Guardian CleanTech Top 100 positions in 2008 and 2009. He was founder member of Scientists Against Nuclear Arms (SANA) and led a group which exposed the links between the U.K. civil and military nuclear programmes.

Lecture 9D



Professor Mike Graham

*Renewable Energy from the Wind,
Waves and Tides*

These are the three forms of energy which appear in the form of mechanical energy and all three have been known historically as sources of energy. We will consider why modern wind turbines have converged on the upwind three-bladed horizontal axis rotor and the challenges with increasing size and deployment offshore. Tidal energy is between large estuary barrier technology and deployment of tidal stream turbines and has attracted a huge number of inventors and theoretical analysts.

Leading devices on which the industry appears to be converging will be discussed together with some of the formidable problems of wave energy.

Mike Graham is Professor of Unsteady Aerodynamics in the Aeronautics Department of Imperial College where he has worked for over 40 years. His first degree is in mathematics from Cambridge University. His work on wind turbine aerodynamics started in the 1980s and has involved both experimental and numerical simulation. He has been involved in UK and EU projects and was coordinator of the EU multi-partner project ROTOW. He also worked on the EU project WEB which looked at the possibilities of incorporating wind turbines into buildings. Since 2000 the scope of his renewable energy research has been widened by work on unsteady flow aspects of tidal stream turbines and he has also worked on the reversible flow Wells Turbine for wave energy extraction.

Lecture 9F



Dr. Andy Heyes

Bioenergy, Biomass and Biofuels

Dr Heyes is a graduate of the University of Manchester, where he received a B.Eng. in Mechanical Engineering (First Class Honours) an M.Sc. and a Ph.D for research concerning the development and application of optical methods for high speed aerodynamics. He is currently a senior lecturer and the Director of Education at the Energy Futures Lab, Imperial College London. He previously worked with Rolls Royce plc and British Aerospace (Military Aircraft Division Warton).

In October 2009 he became a Leverhulme Trust Senior Research Fellow. He is a Chartered Engineer and Fellow of The Institution of Mechanical Engineers. He is also a member of the IMechE Thermofluid Mechanics Committee and the UK Heat Transfer Committee.

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

THURSDAY 29th JULY

20.00 Welcome Party at The Great Hall, Imperial College.

FRIDAY 30th JULY

20.00 Science Forum Bazaar in Sir Alexander Fleming Building, Imperial College.

SATURDAY 31st JULY

19.30 Student Topics in LT G16, Sir Alexander Fleming Building, Imperial College.

SUNDAY 1st AUGUST

20.00 The Great Crossword Treasure Hunt, Imperial College and surrounding areas.

FRIDAY 6th AUGUST

20.00 International Cabaret at Queen's Tower Rooms, Imperial College.

SATURDAY 7th AUGUST

20.00 Songs of Home in Southside Common Room.

SUNDAY 8th AUGUST

20.00 'At Home' in Southside Common Room.

TUESDAY 10th AUGUST

20.00 Farewell Party at Queen's Tower Rooms, Imperial College.



LIYSF offers a varied programme of optional visits. On Friday 30th July at 16.30 tickets will be on sale from LIYSF staff for London sightseeing, Stonehenge and Salisbury visits and three theatre nights. On Monday 2nd August at 16.00 tickets will be on sale from LIYSF staff for Hampton Court, Windsor and final theatre night.

SATURDAY 31st JULY

13.00 Optional sightseeing tour of London.

SUNDAY 1st AUGUST

09.00 Optional excursion to Stonehenge and Salisbury.

MONDAY 2nd AUGUST

19.30 Optional theatre visits.

THURSDAY 5th AUGUST

19.30 Optional theatre visits.

SUNDAY 8th AUGUST

09.00 Optional excursion to Hampton Court Palace and Windsor.

MONDAY 9th AUGUST

19.30 Optional theatre visits.



FRIDAY 30TH JULY LONDON VISITS

30/01 **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.

30/02 **Imperial College London: Earth Science and Engineering**

Part of the Royal School of Mines, where applied aspects of earth science have been taught for more than 150 years. Imperial College brings together specialists in geology, geophysics, mineral and energy resources, earth engineering, environmental science and computational modelling.

30/03 **Zoological Society of London: Veterinary Department**

At the heart of ZSL is commitment to animal welfare and conservation. Veterinary Services operates a detailed programme of preventative medicine, supplies vital field support for ZSL with direct conservation action and maintains a comprehensive database of written and photographic clinical records.

30/04 **Imperial College London, Department of Chemical Engineering**

The site of the UK's largest chemical engineering research activity. Expert in mathematical analysis and modelling; and in experimental investigation and measurement.

30/05 **University College London: Divisions of Biosciences**

Brings together internationally competitive cell, developmental and evolutionary biologists. Provides research strategy in the exciting fields of Life Science; research from molecular analysis of cell signalling processes to aesthetics, philosophy, ethics and the history of medical practices in classical times.

30/06 **Imperial College London: Department of Life Sciences Biochemistry**

Aims to understand, at the molecular level, the function of cells as an integrated system, including details of individual components and biological mechanisms that constitute the system.

30/07 **Royal Botanic Gardens at Kew: The Jodrell Laboratory**

Kew, a UNESCO World Heritage Site, houses the earth's largest and most diverse botanical collections, including reference collections. Visit the Jodrell laboratory, home to Kew's scientific research which embraces plant anatomy, genetics, molecular systematics, biochemistry and biological interactions.

30/08 **Imperial College London: Department of Materials**

The oldest and largest department of its kind in the UK, conducting research into biomaterials for tissue engineering and regenerative medicine; and biotechnology for nanostructures and creating nano-biomaterials.

30/09 **Old Operating Theatre and Herb Garret**

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

TUESDAY 3RD AUGUST DAY VISITS

03/01 **Airbus UK, Filton**

Core activities at Filton include the design, engineering and support for Airbus wings, fuel systems and landing gear integration. Teams also work on systems, structures and aerodynamics research, development and test facilities.

03/02 **Rothamsted Research Centre**

A centre of excellence for science in support of sustainable land management and its environmental impact. Research ranges from studies of genetics, biochemistry, cell biology and soil processes to investigations at the ecosystem and landscape scale.

03/03 **Tilbury Power Station**

Discover the science of electricity generation at Tilbury, a coal-fired power station. Tilbury Power Station has the capacity to generate 1,131MW of electricity for the National Grid system, enough power to meet the needs of approximately one million people.

03/04 **University of Warwick: Electrochemistry & Interfaces/ Electron Microscopy Department**

Research focusing on the application of electrochemistry to the understanding of fundamental and industrially significant interfacial chemical processes at the micro to nanoscale. Cryo-capable microscopes enable work with a wide range of sample types including proteins, synthetic nano particles and polymer vesicle preparations.

03/05 **University College London: Mullard Space Science Laboratory**

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

03/06 **University of Kent: Electronics Laboratory**

Established research groups within the School include broadband and mobile communications and image processing and vision, while new research activities are developing in the areas of embedded systems and digital media.

03/07 **Rutherford Appleton Laboratory**

Supports research in areas including materials and structures, light sources, astronomy and particle physics. Every year about 10,000 scientists and engineers use the Laboratory's facilities to advance their research.

03/08 **National Oceanography Centre Southampton (NOCS)**

NOCS is based at a purpose-built waterside campus in Southampton and is home to some 520 research scientists, lecturing support and seagoing staff. The Underwater Systems Laboratory at NOCS undertakes research, development, demonstration and evaluation in technology to serve the needs of the UK marine science community.

03/09 **AstraZeneca Bristol**

The Avlon site for AstraZeneca is the company's key UK site for manufacture of a wide range of active pharmaceutical ingredients. Over 350 scientists produce the components for, amongst others, heart drugs and schizophrenia treatments.

THURSDAY 5TH AUGUST OXFORD/CAMBRIDGE VISITS

05/C/01 Cambridge University Department of Physics: Cavendish Laboratory

The Cavendish was opened in 1874 as the Laboratory of Physics at the University of Cambridge, one of the first teaching laboratories in England. Visit departments specialising in microelectronics, polymers and colloids, high speed photography and low-temperature physics.

05/C/02 Babraham Research Institute

Innovative biomedical research is undertaken to discover the molecular mechanisms that underlie normal cellular processes and functions, and how, over a lifetime, their failure or abnormality may lead to disease.

05/C/03 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.

05/C/04 EMBL European Bioinformatics Institute

Building on more than 20 years' experience in bioinformatics, the EMBL-EBI maintains the world's most comprehensive range of molecular databases, managing biological data including nucleic acid, protein sequences and micromolecular structures.

05/O/01 Oxford University Botanic Garden and the Museum of Natural History

The Botanic Garden acts as a reference collection of 6,000 types of plant: it is the most compact yet diverse collection of plants in the world and the oldest such garden in Britain. The museum houses the University's zoological, entomological and geological specimens.

05/O/02 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 a technology transfer programme.

05/O/03 Pit Rivers Museum

The Museum displays archaeological and ethnographic objects from all parts of the world. It is equally famous for its celebrated displays and its leading role in contemporary research and museum curatorship.

05/O/04 Oxford University: Department of Chemistry

This is one of the leading chemistry research departments in the world with around 80 academic staff carrying out international-level research. It is currently engaged in a number of areas of work including chemistry for measurement, drug discovery, energy, catalysis, nanochemistry, synthesis, atmospheric chemistry, synthetic biology and femtochemistry.

05/O/05 Museum of the History of Science

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.

FRIDAY 6TH AUGUST MUSEUM VISITS

6/NHM Natural History Museum

The museum is home to life and earth science specimens comprising some 70 million items within five main collections: Botany, Entomology, Mineralogy, Paleontology and Zoology. It is also a world-renowned centre of research, specialising in taxonomy, identification and conservation.

6/SM 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. See, touch and experience the major scientific technological and medical advances of the last three hundred years.



Natural History Museum

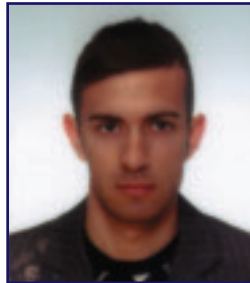


Science Museum



Richard Myhill – Conference Director
Louisa Webb – Conference Assistant

Chief of Staff



Erik Szabo

Slovakia
Studying at University level at
Comenius, Bratislava

Southside Hall



Ojali Negedu

Nigeria
Studying Pharmacy at
Kings College London

Beit Hall



Joao Vicente

Portugal
Studying Environmental
Engineering at Porto University

Hosts

Host Support



Lukas Stritesky

Czech Republic
Studying at Charles University

Southside Hall

Beit Hall

Deputy Hall Hosts



Negin Baradari

Luxembourg
Studying at University level



Samia Elkommos

UK
Studying at Imperial College London

Chief of Counsellors



Sean O'Callaghan

Ireland
Studying at Cork Institute of Technology



Maria Esteban

Spain
Studying at the University of Edinburgh

Counsellors



Helen Peregrine

UK
Studying at Cardiff University



Fionnuala Connolly

Ireland
Studying at National University Ireland

Counsellors



Antonio Carlos Grilo

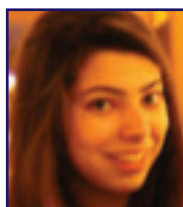
Portugal
Studying at Instituto Superior Técnico – Lisbon



Thomas William Gilbertson

UK
Studying at Southampton University

Counsellors



Sofia Stella Christou

Cyprus
Studying at University level



Patricia Contreras Tejada

Spain
Studying at Conservatorio Profesional de Música 'Adolfo Salazar'

Imperial College London



“Continual training is vital. However, with the focus on the practical learning, it was more so that I was enjoying a team to work with that was the beginning of this great year.”
www.imperial.ac.uk/olympics/ny/10/10/10



see for yourself

- Blogs
- Interactive map
- Facebook
- ICRadio
- Twitter
- Podcasts
- iTunes
- Flickr

www.imperial.ac.uk/interact



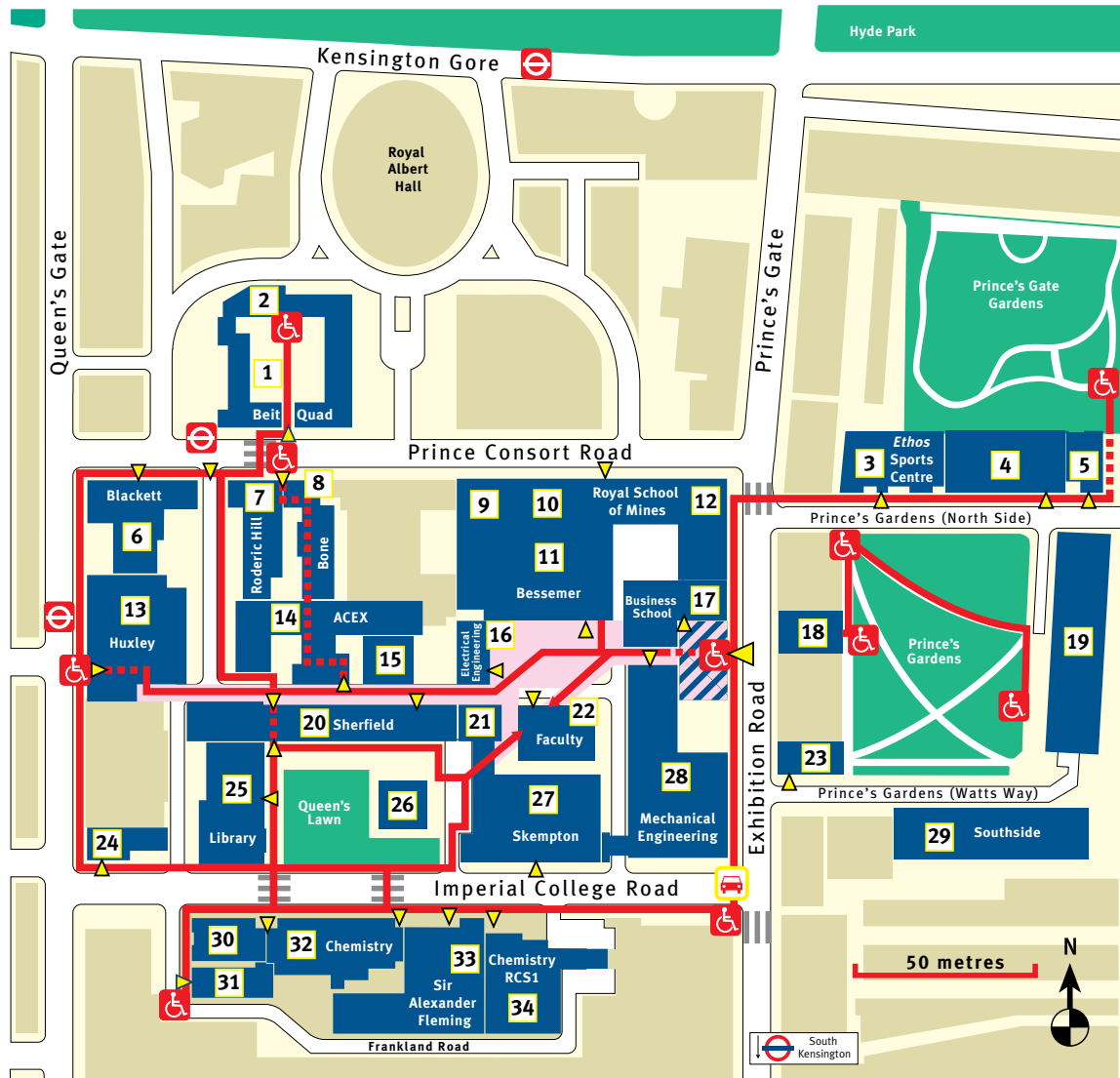
Imperial College London congratulates all participants on a successful 2010 London International Youth Science Forum.

Stay connected with what's happening at Imperial and learn more about the exciting opportunities on offer:
www.imperial.ac.uk/prospectivestudents

↑
curious?
check out our
prosperitas to
find out more

Imperial College London

South Kensington Campus



- Main walkway
- Main entrance
- Accessible route
- South Kensington Underground
- Bus stops
- Building entrances
- Vehicle entrance



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 Garden Hall	14 ACE Extension	23 Grantham Institute for Climate Change	30 Wolfson Building
5 Weeks Hall	15 William Penney Laboratory	24 Faculty Building	31 Flowers Building
6 Blackett Laboratory	16 Electrical Engineering	25 58 Prince's Gate	32 Chemistry Building
7 Roderic Hill Building	17 Business School	26 170 Queen's Gate	33 Sir Alexander Fleming Building
8 Bone Building	18 53 Prince's Gate	27 Imperial College and Science Museum Libraries	34 Chemistry RCS1
9 Royal School of Mines	19 Eastside	28 Queen's Tower	
10 Aston Webb			



London International Youth Science Forum

Royal Parade Mews
Chislehurst
Kent BR7 6TN
United Kingdom

T: +44 (0)20 8295 8395
F: +44 (0)20 8295 8650
E: enquiries@liysf.org.uk

www.liysf.org.uk

