

65TH EDITION
LONDON INTERNATIONAL
YOUTH SCIENCE FORUM



65TH LONDON INTERNATIONAL YOUTH SCIENCE FORUM

24TH JULY – 7TH AUGUST 2024

'SCIENCE ACROSS BORDERS'



THE LONDON INTERNATIONAL YOUTH SCIENCE FORUM (LIYSF)

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

LIYSF is an impartial, accredited not-for-profit social enterprise. We are part of a diverse international network of social enterprises – the Social Enterprise Mark is an independent guarantee that we put the interests of people and the planet above financial gain.

Chief Executive

Richard Myhill: [2009 – Present]

Royal Patron

HRH The Princess Royal: [2020 – Present]

Scientific Advisor

Émer Hickey: [2023 – Present]

President

Professor Clare Elwell: [2018 – Present]

Science Patron

Professor Richard O’Kennedy [2018 – Present]

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Peter Brewer, Steve Brosnan & Vanessa Smith

Founder Patron

HRH Prince Philip, Duke of Edinburgh [1959 – 1969] & Past Patron: HRH The Duke of Kent [1983 – 1988]

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**bold typography denotes Nobel Prize winners.*

Memorial Scholarships awarded to commemorate

George McGowan, John Needle & Tim Rooke

Former Directors

George McGowan & John Needle





HRH THE PRINCESS ROYAL



BUCKINGHAM PALACE

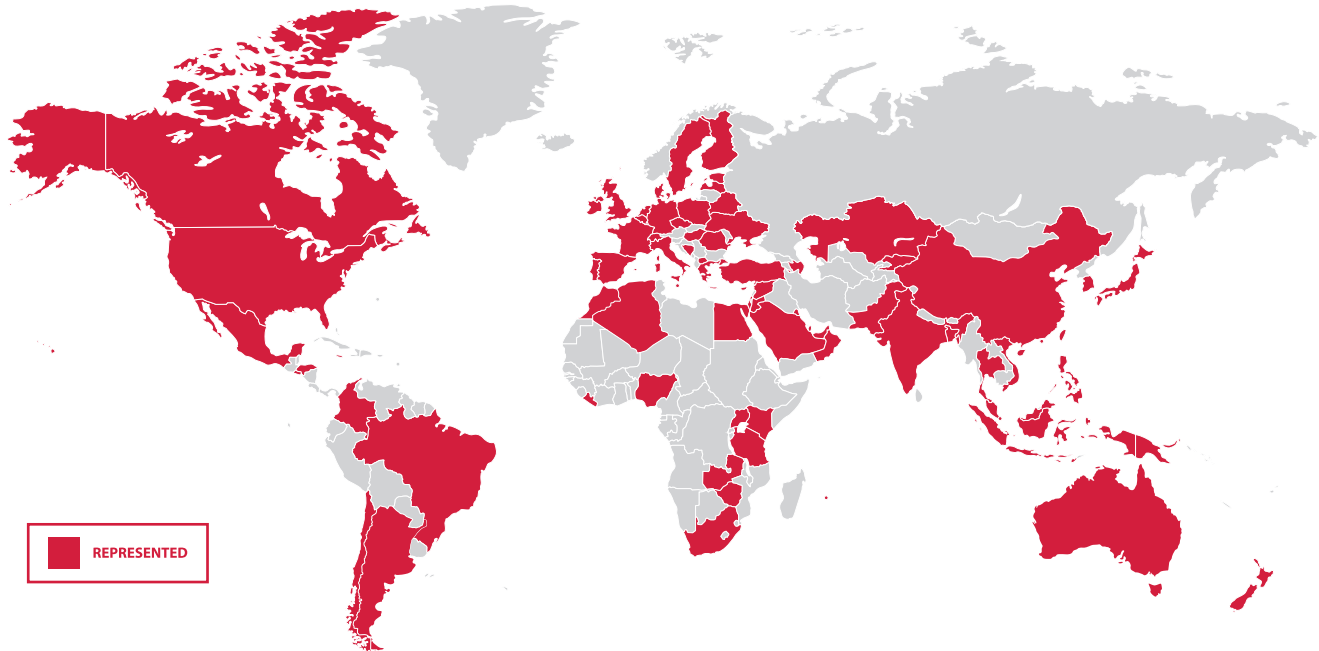
As Patron of the London International Youth Science Forum, it gives me great pleasure to welcome you to its 65th edition. Over the next two weeks you will create your own international community. Establishing a basis of international understanding and uniting around a common interest, such as science, is often the cement that binds together the strongest friendships and connections.

The importance of scientific and technological development and their relationship to the needs of humankind, has never been greater. As you attend this Forum, you will gain significant insights into science and the role it plays in positive progress within society. You will have the opportunity to engage with some of the very best scientific minds and learn about a broad range of science topics.

I hope that you enjoy and make the most of your time at LIYSF.

***HRH The Princess Royal
Royal Patron of the London International Youth Science Forum***

82 REPRESENTED COUNTRIES & TERRITORIES



ALGERIA
ARGENTINA
AUSTRALIA
AZERBAIJAN
BANGLADESH
BELARUS
BELGIUM
BOSNIA & HERZEGOVINA
BRAZIL
CANADA
CHILE
CHINA
COLOMBIA
CYPRUS
CZECH REPUBLIC
DENMARK
EGYPT

EL SALVADOR
ENGLAND
ESTONIA
FINLAND
FRANCE
GERMANY
GREECE
GUERNSEY
HONDURAS
HONG KONG
HUNGARY
INDIA
INDONESIA
IRELAND
ISRAEL
ITALY
JAMAICA

JAPAN
JORDAN
KAZAKHSTAN
KENYA
REPUBLIC OF KOREA
KUWAIT
KYRGYZSTAN
LATVIA
LIBERIA
LUXEMBOURG
MACEDONIA
MALAYSIA
MALTA
MAURITIUS
MEXICO
MOROCCO

NETHERLANDS
NEW ZEALAND
NIGERIA
OMAN
PAKISTAN
PALESTINE
PAPUA NEW GUINEA
PHILIPPINES
POLAND
PORTUGAL
QATAR
ROMANIA
SAUDI ARABIA
SCOTLAND
SINGAPORE
SOUTH AFRICA

SPAIN
SWEDEN
SWITZERLAND
SYRIAN ARAB REPUBLIC
TAIWAN (ROC)
TANZANIA
THAILAND
TURKEY
UGANDA
UKRAINE
UNITED ARAB EMIRATES
UNITED STATES OF AMERICA
VIETNAM
WALES
ZAMBIA
ZIMBABWE



WELCOME



It is with great pleasure that we welcome you to the 65th London International Youth Science Forum. We are thrilled that so many of you are able to join us.

The theme for this year's Forum is *"Science Across Borders"*. The role of science in our societies is more important than ever. We see its impact in every area of our lives, from personalised healthcare and sustainable energy to artificial intelligence and low carbon transport. To deliver global solutions which are equitable and affordable requires innovation, interdisciplinary collaboration and international partnerships – all of which echo the core tenets on which LIYSF was founded over six decades ago.

Whether you are joining us in person or online during the next two weeks, the Forum will give you the opportunity to engage with world leading scientists and learn about their cutting-edge work. You will be encouraged to debate, communicate and challenge scientific ideas. And in the true spirit of the Forum, you will interact and share these experiences with other young scientists from over 80 countries across the globe.

Use your time at the Forum to expand your knowledge, investigate new ideas and make connections – you are surrounded by the future of science and a network which will support you for the rest of your lives and careers! Get involved and make the most of this life-changing opportunity.

Everyone is welcome at LIYSF and we are thrilled to have you with us. You are now part of a special family.

Let's change the world!

A stylized, handwritten signature in black ink, likely belonging to Professor Clare Elwell.

Professor Clare Elwell
President

A stylized, handwritten signature in black ink, likely belonging to Richard Myhill.

Richard Myhill
Director

SCHEDULE OF EVENTS

Wednesday 24th July	10:00 – 17:00	Arrivals
	19:30 – 21:30	Welcome Talks & Campus Tour, Copthorne Tara
Thursday 25th July	11:00 – 12:30	LIYSF Opening Ceremony – Ondaatje Theatre, Royal Geographical Society
		President's Address: Professor Clare Elwell , Keynote Address: Sir Gregory Winter
	15:00 – 15:30	Programme Introductions – Ondaatje Theatre, Royal Geographical Society
	15:30 – 17:00	Professor Kelly Chibale – Ondaatje Theatre, Royal Geographical Society
	20:00 – 21:30	Welcome Quiz Night – Shannon Suite, Copthorne Tara
Friday 26th July	Morning	Visits to Research & Scientific Establishments in London
	15:15 – 16:45	Dervilla Mitchell – Ondaatje Theatre, Royal Geographical Society
	19:30 – 21:30	Great Crossword Treasure Hunt – Queen's Lawn & South Kensington Area
Saturday 27th July	09:30 – 11:00	Professor Dame Molly Stevens – Ondaatje Theatre, Royal Geographical Society
	14:00 – 17:00	The Science Bazaar, Student Project Poster Board Event – Royal Geographical Society
	19:00 – 22:00	Optional London Guided Coach Tour
Sunday 28th July	08:30 – 17:30	Optional Visit to Stonehenge or Hampton Court Palace
	19:45 – 21:15	Dr Jason Nurse , Student Debate Evening – Ondaatje Theatre, Royal Geographical Society
Monday 29th July	09:30 – 12:00	Specialist Lectures – Queen's Lawn, Imperial College London
	14:30 – 16:00	Professor Larissa Suzuki – Ondaatje Theatre, Royal Geographical Society
	19:45 – 21:15	Student Project Topics – Ondaatje Theatre, Royal Geographical Society
Tuesday 30th July	All Day	National Visits to Research & Scientific Establishments
	19:45 – 21:15	Dr Paul McFarlane – Ondaatje Theatre, Royal Geographical Society
Wednesday 31st July	09:00 – 17:00	Specialist Study Day led by Dr Howard Haughton – Queen's Lawn, Imperial College London
	19:00 – 22:30	Optional Theatre Shows

SCHEDULE OF EVENTS

Thursday 1st August	All Day	Visits to Oxford and Cambridge Research and Scientific Institutions
	19:00 – 21:00	Rehearsals and Auditions – Liffey Suite, Copthorne Tara
Friday 2nd August	09:30 – 12:00	LIYSF Alumni Specialist Lectures – Queen's Lawn, Imperial College London
	14:00 – 15:30	Professor Ghada Bassioni – Ondaatje Theatre, Royal Geographical Society
	15:30 – 17:30	Visits to The Science Museum or Natural History Museum
	20:30 – 22:00	International Cabaret: Showcase Performance Evening – Shannon Suite, Copthorne Tara
Saturday 3rd August	10:30 – 12:00	UKRI RoboHike Team – Ondaatje Theatre, Royal Geographical Society
	14:00 – 15:30	Professor Pete Vukusic – Ondaatje Theatre, Royal Geographical Society
	19:15 – 20:45	LIYSF Sports Day Session – Ethos Sports Hall, Imperial College London
Sunday 4th August	08:30 – 17:30	Optional Visits to Oxford or Cambridge
	12:30 – 16:30	Optional Visit to the Tower of London
	20:30 – 22:00	Traditions of Home: Sharing World Customs & Fashion – Shannon Suite, Copthorne Tara
Monday 5th August	09:30 – 12:00	Specialist Lectures – Queen's Lawn, Imperial College London
	12:30 – 18:30	Optional Visits to Buckingham Palace and the London Eye
	19:00 – 22:30	Optional Theatre Shows
Tuesday 6th August	10:00 – 11:30	Student Debate Forum – Ondaatje Theatre, Royal Geographical Society
	14:30 – 16:00	Closing Lecture: Vilas Dhar – Ondaatje Theatre, Royal Geographical Society
	16:00 – 17:00	Closing Ceremony – Ondaatje Theatre, Royal Geographical Society
	20:30 – 23:30	Farewell Party – Shannon Suite, Copthorne Tara
Wednesday 7th August	08:00 – 10:00	Departures

Principal Lectures & Demonstrations

Specialist Lectures

Scientific Visits

Social Programme

Optional Visits



KEYNOTE ADDRESS

CREATING NEW ANTIBODY MEDICINES

Sir Gregory Winter
University of Cambridge

For centuries, mankind has used small organic chemicals as medicines, at first as the natural products of plants, and later as synthesized by organic chemists. However, in the last 50 years, with the advent of recombinant DNA technology, we have seen the emergence of an entirely new class of medicines, “biologics”, based on large biopolymers such as DNA, RNA or protein. Of these, monoclonal antibodies have emerged as the paramount biologic, especially for the treatment of cancer and autoimmune inflammatory diseases. How were such antibody medicines developed? And where is the technology now taking us?

Sir Gregory Winter’s research career was based at Medical Research Council’s Laboratory of Molecular Biology in Cambridge. He is best known for developing technologies that led to several blockbuster antibody drugs for treatment of cancer and immune inflammatory diseases. For his work on making human antibodies by phage display he shared the Nobel Prize in Chemistry in 2018. In parallel with his research, he immersed himself in commercial matters, including the filing of patents, the development of licensing strategies and the founding of start-up companies.

He is a Fellow of Trinity College, Cambridge and was the Master of Trinity from 2012 to 2019. He was elected a member of the European Molecular Biology Organisation in 1987, a Fellow of the Royal Society in 1990 and Fellow of the Academy of Medical Sciences in 2006, as well as being a Fellow or Honorary Fellow of many other professional organisations. He has been awarded numerous prizes and medals. He received a Knighthood for services to Molecular Biology in 2014.

Photo Copyright: The Croucher Foundation

PRINCIPAL LECTURES & DEMONSTRATIONS



25TH JULY SCIENTIFIC INNOVATION & ENTREPRENEURSHIP OUT OF AFRICA

Professor Kelly Chibale
University of Cape Town, South Africa

There are wide differences in how various patient populations respond to medicines, influenced by genetics, and the socioeconomic and physical environment. It is thus vital to build capacity to discover and develop medicines near patient populations. On the other hand, science is not just for curiosity but can be used for development, for example to create jobs and career opportunities. This lecture will present a case study of building medicines discovery capacity near the African patient population and scientific entrepreneurship at the University of Cape Town Holistic Drug Discovery and Development (H3D) Centre.

Kelly Chibale is a full Professor of Organic Chemistry at the University of Cape Town where he holds the Neville Isdell Chair in African-centric Drug Discovery & Development. He is also a Schmidt Sciences AI2050 Senior Fellow, and the Founder and Director of the UCT Holistic Drug Discovery and Development (H3D) Centre. Kelly obtained his PhD in Synthetic Organic Chemistry from the University of Cambridge in the UK. This was followed by postdoctoral stints at the University of Liverpool in the UK and at The Scripps Research Institute in the USA.



26TH JULY REALISING DESIGN & DELIVERING PROJECTS

Dervilla Mitchell
Arup Group

In this lecture Dervilla will share her career journey and describe a number of large scale aviation projects, including T5 Heathrow, T2 Dublin and Abu Dhabi Mid Field Terminal. She will outline the design drivers for each and how different factors influence how our designs develop and how other factors influence the eventual outcomes.

Dervilla is a Civil Engineer with experience in leading major programmes notably Terminal 5, Heathrow, Terminal 2, Dublin, Abu Dhabi Midfield Terminal as well as the Athletes Village, London 2012. Until recently she was Deputy Chair of Arup Group a collective of over 19,000 designers, advisors and experts working across 140 countries. Trained as a civil engineer she has spent most of her career working in the UK but prior to that she was based in Boston and Dublin. Dervilla is a Fellow of Engineers Ireland, the Institution of Civil Engineers and the Royal Academy of Engineering where she currently chairs the Diversity & Inclusion Committee. She is a member of the Prime Minister's Council for Science and Technology. She was awarded a CBE for services to engineering in 2014 and received an honorary doctorate from University College Dublin in 2016.



27TH JULY

**DESIGNING MATERIALS TO
HEAL THE BODY &
DETECT DISEASES EARLIER**

Professor Dame Molly Stevens
University of Oxford

This lecture will cover our nanomedicine portfolio including nanosensors for diagnosing and monitoring infectious and non-communicable diseases, nanomimicking approaches for virus and parasite host cell entry inhibition recently demonstrated for malaria, HSV-2 and SARS-CoV-2, high molecular weight polymer carriers for enhanced delivery of saRNA therapeutics, and photo-responsive nanoreactors inspired in the circadian rhythms. Advances in Raman spectroscopy for high-throughput label-free characterization of single nanoparticles (SPARTA™) that allow us to integrally analyse a broad range bio-nanomaterials without any modification. SPARTA™ has become an integral tool for the design of nanotherapeutics, with recent examples including DOPC-containing lipid nanoparticles for nucleic acid delivery and dendrimersome-based systems for controlled delivery of anti-bacterial drugs, and for profiling extracellular vesicles (EVs) for detection of breast cancer through a minimally invasive liquid biopsy.

Professor Dame Molly Stevens DBE FREng FRS is John Black Professor of Bionanoscience at the University of Oxford and also holds part-time professorships at Imperial College London and the Karolinska Institute. Molly's multidisciplinary research balances the investigation of fundamental science with the development of technology to address some of the major healthcare challenges. She is a serial entrepreneur and the founder of several companies in the diagnostics, advanced therapeutics and regenerative medicine space. Her work has been instrumental in elucidating the bio-material interfaces. She has created a broad portfolio of designer biomaterials for applications in disease diagnostics and regenerative medicine. Her substantial body of work influences research groups around the world (>450 publications, h-index 116, >53k citations, 2018, 2021, 2022 and 2023 Clarivate Analytics Highly Cited Researcher in Cross-Field research).



28TH JULY

**GENERATIVE AI:
A CATALYST FOR PROGRESS
OR A SOURCE OF PERIL?**

Dr Jason Nurse
University of Kent

Generative AI, like ChatGPT, represents a groundbreaking advancement in technology, reshaping how we interact with information. This talk delves into the transformative potential of these systems, from enhancing creativity and productivity to revolutionizing industries. However, it also explores the darker side, addressing concerns like cyber security risks, ethical dilemmas, misinformation, and privacy issues. Join us as we unravel the complexities of generative AI, offering insights and sparking debate among young scientists about harnessing its power responsibly and ethically.

Dr Jason R. C. Nurse is an Reader in Cyber Security at the Institute of Cyber Security for Society (iCSS) and School of Computing at the University of Kent. He is also an Associate Fellow at the Royal United Services Institute (RUSI) for Defence and Security Studies, visiting academic at the University of Oxford, visiting Fellow in Defence and Security at Cranfield University, a professional member of the British Computer Society, a research member of Wolfson College Oxford and a member of the Security Awareness Special Interest Group (SASIG).



29TH JULY BUILDING THE INTERPLANETARY INTERNET

Professor Larissa Suzuki
University College London

Have you ever wondered how Internet can work in space and connect space vehicles and astronauts? Or allow astronauts to talk to spacecrafts? In this talk we will explore the concept of Interplanetary Internet and how we can use artificial intelligence to create a solar system Internet and empower astronauts in space exploration.

Larissa Suzuki is a passionate computer scientist, chartered engineer, author, entrepreneur, and inventor and a professor, with +20 years of industry experience. Her continuing academic work is based at UCL where she serves as an Honorary Associate Professor in Computer Science, and at Nasa JPL as a visiting scientist. She currently holds a Technical Director position in industry. Since 2002 she has been actively working towards increasing the representation of women and people with disabilities in Engineering.



30TH JULY SPIES AMONG US: HUMAN AGENTS & THE AI REVOLUTION

Dr Paul McFarlane
University College London

This lecture explores some of the controversies related to using human undercover agents to prevent crime and terrorism and how such methods might evolve in the era of the artificial intelligence revolution. From a crime science perspective, it will consider what we currently know about the motivations, public perceptions and ethical dilemmas faced by human agents and their respective organisations. Drawing on a range of crime and counter-terrorism case studies, we will discuss the interplay between traditional approaches and the rapid development of artificial intelligence technologies, addressing future challenges and opportunities in physical and non-physical realms.

Dr Paul McFarlane is a Lecturer in Crime Science at University College London's Jill Dando Institute of Security and Crime Science and Centre for Global City Policing. Paul teaches and supervises research in policing, crime reduction, criminal investigation, terrorism and organised crime. Paul's research interests include surveillance, intelligence, investigative failures and the effect of undercover methods in tackling crime and terrorism. Paul has three decades of experience working with law enforcement, policing and international intelligence agencies to develop cyber and real-world operational capabilities to detect and disrupt international terrorist organisations and organised crime groups.



2ND AUGUST

THE EXCITEMENT OF CHEMICAL DISCOVERY

Professor Ghada Bassioni
Saxony Egypt University, Egypt

What is behind the curse of the pharaoh, what material was used to build the pyramids, how does climate change influence our lives and many more questions were my drive to study chemistry. The exploration of the unknown, the quest for knowledge, and the possibility of useful applications that can advance our knowledge of the world and improve our quality of life are what make chemical discovery so exciting. Through unravelling some mysteries in ancient Egypt, this lecture will demonstrate the thrill of exploration, the satisfaction of solving puzzles and the possibility of game-changing modern applications.

Ghada has been recently appointed as the President of Saxony Egypt University for Applied Science and Technology and is on leave as a Professor at the Chemistry Division at the Faculty of Engineering, Ain Shams University, Cairo, Egypt, where she led the Division for 10 years. She is a selected bureau member of the International Committee of Pure and Applied Chemistry (IUPAC) since 2019 and a member of the Egyptian National Committee for Pure and Applied Chemistry, Egyptian Academy of Scientific Research and Technology since 2017. She has been recognized with several national, regional, and international awards. Prof. Bassioni was selected as an academic visitor and panellist at the Nobel Laureates meetings in Lindau, Germany, in 2012 and 2014, respectively. In 2013, she received the Young Scientist Award at the World Economic Forum, the Next Einstein Forum Award in 2016 and the African Science Leadership Award in the same year.

3RD AUGUST

COGNITIVE ROBOTS FOR GOOD

UKRI RoboHike Team
University College London

Join the UKRI RoboHike team as we explore the exciting world of cognitive legged robots and their potential to create positive change! In this talk, we will delve into the innovative designs and intelligent systems behind these advanced robots, showcasing how they navigate complex environments with agility and precision. Discover real-world applications where these robots aid in disaster relief, agriculture, and environmental conservation. By blending cutting-edge technology with a mission for good, cognitive legged robots are paving the way for a brighter future for the betterment of humanity and our planet.

The UKRI RoboHike team is based at UCL East campus with a mission to develop smart robots that can help humans in various hazardous and dangerous jobs. The team includes Dr. Dimitrios Kanoulas, Associate Professor, Dr. Valerio Modugno and Dr. Jianhao Jiao, Senior Researchers at UCL, Department of Computer Science.



KEYNOTE CLOSING LECTURE



3RD AUGUST ALL THINGS BRIGHT: BEAUTIFUL SCIENCE USING THE LIVING WORLD

Professor Pete Vukusic
University of Exeter

Pete Vukusic is a Professor of Physics and a Dean for Education at the University of Exeter. He spent his school days at St. Joseph's College in South London, and his university days at Exeter and at Imperial College, London. He is a qualified teacher and taught for many years at schools in Taunton and in Marlborough. Since 2001, Pete has led the Biological Photonics research group at Exeter. The group's aims are to try to understand biological strategies that are at work in the manipulation of light and the creation of the appearances of animals and plants, then to apply these strategies for the design or improvement of useful technologies.

Pete has been communicating science to the public and delivering science outreach to students and adults in the UK, the EU, the US and across Africa since his early days as a teacher in schools. He is an Institute of Physics Schools lecturer and a Royal Society award winner for science communication. Using demonstrations and live activities, award-winning scientist and science communicator Pete Vukusic will describe how the exciting discipline of bio-inspiration is leading directly to new technologies and devices, and is shedding light on the wonder of the natural world.



6TH AUGUST AI-ENABLED HUMAN-CENTRED FUTURE

Vilas Dhar
Patrick J. McGovern Foundation, USA

Vilas Dhar is an inspiring voice of hope and engagement for an AI-enabled, human-centered future. As a philanthropist, technologist, and scholar, Vilas advocates for an equity-based approach to designing products and policies that create a more thriving, sustainable, and equitable world. He serves as President of the Patrick J. McGovern Foundation, as an advisor to multiple global institutions – including his recent appointment by Secretary-General António Guterres to the UN High-Level Advisory Body on Artificial Intelligence, and as the author of a widely viewed course on ethics in the age of generative AI in the world. He is a regular contributor to media outlets including BBC, The Wall Street Journal, Time Magazine, NBC News, and ABC News. His LinkedIn Learning course, Ethics in the Age of Generative AI, has been translated into six languages and reached over 100,000 learners worldwide.

SPECIALIST LECTURES - 29TH JULY



29.1 CHEMICALS IN THE URBAN WATER CYCLE

Dr Leon Barron

Imperial College London

This lecture will focus on how the chemicals we use in our everyday lives end up in our environment. There are approximately 200 million chemicals in existence, representing a massive challenge for environmental scientists to understand impacts on flora, fauna and on us. Dr Barron will focus on how chemicals get there, but also how we measure them, assess their risks and focus on a few key examples including how London's waterways changed chemically during the COVID-19 pandemic, how medications we use on our dogs and cats can end up in rivers, and 'forever chemicals' in our drinking water.

Dr. Leon Barron is a Reader in Analytical and Environmental Sciences at Imperial College London. He leads the Emerging Chemical Contaminants group there focusing on the sources, risks, threats, and impacts of toxic chemical mixtures on environmental and public health. He is a Fellow of the Royal Society of Chemistry (RSC), the Chartered Society of Forensic Sciences and the Higher Education Academy. Among several committees, he was elected to the RSC Analytical Science Community Council in 2019 to promote the chemical sciences in environmental pollution and health fields.



29.2 GENOME DETECTIVES; DECODING BACTERIAL DNA TO HELP FIGHT INFECTIONS

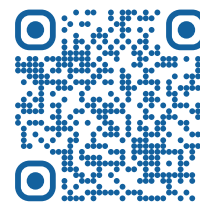
Dr Fran Colles

University of Oxford

Take a trip down a double helix (that's DNA). In this lecture I will demonstrate the cutting edge techniques scientists use to investigate infectious disease, from discovering the early origins of plague, to investigating the most obscure outbreaks of food poisoning. Using *Campylobacter* as an example, we will discuss the challenges faced through rising antimicrobial resistance, also termed the 'silent pandemic', and the implications of increasing globalization and intensive agriculture.

Dr Fran Colles is Departmental lecturer at the University of Oxford. She is a state registered Biomedical Scientist and microbiologist. She began her career working in veterinary and NHS diagnostic laboratories before moving to research. She gained a DPhil from Oxford University and her continued research interests include the transmission of infectious disease from farms to food, combined with animal health and welfare.

*In order to enjoy the interactive element to this lecture, please register for a free account through this QR code and the *Campylobacter jejuni/coli* database, which can be accessed on your phone.*





29.3

SUSTAINABLE CYCLICAL ECOSYSTEMS & WASTE USE

Professor Lawrence Ezemonye
Igbinedion University, Okada, Nigeria

This lecture will explore the principles and practices of creating sustainable cyclical ecosystems, focusing on the innovative use of waste materials. By examining the interactions within ecosystems and the role of waste as a resource, this lecture will highlight methods to reduce environmental impact and enhance sustainability. Topics include the transformation of waste into renewable energy, recycling processes, and the implementation of environmentally friendly practices in industrial and agricultural sectors. Attendees will gain a comprehensive understanding of how to design and manage ecosystems that minimize waste and promote resource efficiency. Prof. Ezemonye will also share case studies and best practices, providing practical insights into sustainable development. This lecture is essential for environmental scientists, policymakers, and anyone interested in advancing sustainable ecological practices.

Professor Lawrence Ikechukwu Ezemonye is a Professor of Ecotoxicology and Environmental Forensics, a fellow of the Nigeria Academy of Science with over 30 years' experience in research and teaching. Vice-Chancellor of Igbinedion University, Okada, Nigeria; a Visiting Professor to Lancaster University, UK. President and Chairman of Council, Institute of Environmental Practitioners of Nigeria (IEPN). Chairman of the Centre for Global Eco-Innovation, University of Benin, Member of the AU-African Scientific Research and Innovation Council (ASRIC); Served as Deputy Vice-Chancellor University of Benin Nigeria, Federal Director of the National Centre for Energy and Environment of the Energy Commission of Nigeria, member of the Federal Government of Nigeria Technical Working Groups for the Development of the Nigeria Agenda 2050 and Medium-Term National Development Plan (MTNDP 2021-2025). Has over 250 scientific papers, keynote/guest speaker at over 100 conferences, attended over 300 conferences, principal investigator and multiple research grant recipient.



29.4

INVISIBLE BEASTS & WHERE TO FIND THEM

Dr Jiachen Jiang
University of Cambridge

The most mysterious objects in our Universe are black holes. They are invisible because their gravity is so strong that no light can escape them. This lecture will introduce what black holes are, where to find them using the latest telescopes, how they devour matter and whether matter can escape from them based on the latest astronomical observations.

Dr Jiachen Jiang is a Leverhulme/Isaac Newton Fellow at the Institute of Astronomy and a College Fellow at St Edmund's College, University of Cambridge. Her research interests include multi-wavelength observations of AGN, black hole X-ray transients, and any other accreting object.



29.5

WAKING UP TO THE IMPORTANCE OF SLEEP

Professor Simon Kyle
University of Oxford

This talk will introduce you to the fascinating world of sleep research and outline the importance of sleep and circadian rhythms for health and wellbeing. For example, he will discuss what happens in the brain during sleep, the impact of artificial light on our sleep-wake patterns, and present the latest science on how technology can be used to improve sleep.

Simon Kyle is Professor in the Sleep and Circadian Neuroscience Institute (SCNi), Nuffield Department of Clinical Neurosciences, University of Oxford. He is also programme director for the Oxford Online Programme in Sleep Medicine. He holds an MA (First Class Hons) in Psychology and PhD in Psychological Medicine, both from the University of Glasgow. His research focuses on developing and testing interventions for sleep disorders and the interaction between sleep disruption and mental health.



29.6

THE MATHEMATICS & PHYSICS OF WOUND HEALING

Professor Tanniemola B. Liverpool
University of Bristol

This lecture will discuss recent work looking quantitatively at the process of wound healing using ideas from thermodynamics and statistical mechanics. Wound healing is a highly conserved process required for survival of an animal after tissue damage. This process is not only of great interest in its own right but is also a laboratory to study complex tissue dynamics and regeneration. Many wounds involve damage to an epithelial (barrier) tissue (like skin) that separates different regions of the body of a living organism. Recent work on studying wound healing in two dimensional epithelial tissues of a fruit fly pupal wing will be discussed. This epithelium was chosen because it is transparent and accessible to sophisticated imaging techniques. We use live confocal time-lapse microscopy to follow the behaviour of cells in a tissue before and after wounding. The lecture will focus on three cell-behaviours that are generally accepted to contribute to wound re-epithelialisation: cell shape deformation, cell division, and cell migration; as well as describing how we are beginning to use a combination of mathematics, physics and biology to disentangle some of the organising principles behind the complex orchestrated dynamics that lead to wound healing.

Professor Tanniemola has been based at the Applied Mathematics Institute of the School of Mathematics at Bristol University for the last 16 years. He has undergraduate and PhD degrees from the University of Cambridge and worked at several academic institutions in France, Germany and the UK. His research primarily involves mathematical descriptions of complex fluids (membranes, polymers, gels) and he is increasingly interested in the study of "soft biological matter" (DNA, proteins, the cytoskeleton, gene regulation), and the organising principles behind this highly interesting active (living) state of matter.



29.7

SEARCHING FOR NEW FUNDAMENTAL INTERACTIONS

Dr Luca Mantani

University of Cambridge

From ancient philosophers to modern scientists, our understanding of natural phenomena relies on the concept of interactions among fundamental constituents of reality. This concept evolved over time, culminating in the construction of the most successful theory in history: the Standard Model of Particle Physics, which describes Nature at the subatomic scale. In this lecture, Dr Luca Mantani will guide you through the formulation of this model, which relies on two staples of modern science: special relativity and quantum mechanics. He will demonstrate why, despite its success, it cannot be the final theory and will discuss current efforts to discover new interactions at the Large Hadron Collider.

Dr Luca Mantani is a researcher in theoretical particle physics at the University of Cambridge, with a broad interest in understanding the fundamental structure of Nature. Specifically, Dr Luca is an expert in particle collider phenomenology and the focus of his research is the identification of novel interactions among fundamental particles. Additionally, he actively conducts Dark Matter research, with a particular emphasis on indirect detection and collider production.



29.8

FORENSIC SCIENCE: CHALLENGES, BREAK- THROUGHS & WHAT NEXT?

Professor Ruth Morgan

UCL Centre for the Forensic Sciences

Forensic science is a technological success story, the last 25 years have seen unprecedented developments in our capabilities to establish what a trace is and who it has come from. Yet, we still witness miscarriages of justice and challenges to the use of science in the service of justice. This lecture will take us on a journey to explore forensic science, why these challenges exist, what the root causes of those challenges are, and how research is helping us to solve these challenges in the real world.

Ruth Morgan is Professor of Crime and Forensic Science, the Founder and Director of the UCL Centre for the Forensic Sciences, and Co-Founder and Co-Director of the UCL Arista Institute (a collaboration between the faculties of Engineering Sciences and Arts + Humanities). Ruth works at the intersection of science, technology and the humanities, with a focus on real world challenges and impact. She has acted as a Specialist Advisor to the House of Lords Science and Technology Committee during their inquiry into Forensic Science, was elected a World Economic Forum Young Scientist, and a member of World.Minds, and she serves on the Frontiers Policy Labs editorial board.

SPECIALIST STUDY DAY - 31ST JULY



31.1

AN INTRODUCTION TO TISSUE ENGINEERING

Avalon Johnson

EMBL Barcelona, Spain

Basic understanding of human biology underlying disease progression is critical for the development of new therapeutic approaches. However, in most cases, the tissues of interest are difficult or impossible to access inside of the body. Thus, the field of tissue engineering began: aiming to develop three-dimensional human-derived tissues outside of the body! Creating these in vitro organs allows control of the tissue environment, editing of genetic material, and easier access for imaging: overall providing greater insight to functional changes that can occur in disease. This introductory lecture will discuss the different properties, such as cell signaling and mechanical forces, that can be manipulated to guide differentiation of cells towards the desired organ. In particular, we will emphasize how researchers are harnessing human induced pluripotent stem cells to overcome current limitations in biomedical research.

Avalon Johnson received her BSc and MSc from California Polytechnic State University, San Luis Obispo, California in Biological Sciences, with specialization in regenerative medicine. Inspired by tissue engineering, she moved to the University of California, San Diego where she spent two years as a research associate using stem cell-derived brain organoids to explore the impact of a rare pediatric neurodegenerative disease on immune cells of the brain called microglia. She is now a PhD candidate at EMBL Barcelona, Spain, where her current project in the Haase lab focuses on developing an in vitro organ on-chip model of cardiac blood vessels, with the goal of using this model to investigate disease progression.

31.2

UNDERSTANDING THE DATA FROM THE LARGE HADRON COLLIDER

Professor Freya Blekman

DESY & University of Hamburg, Germany

Ever wondered about why the 27 kilometer Large Hadron Collider was built and what scientists do with it? Then this is the talk for you! The collider is the Swiss army knife of experiments, and investigates anything from new particles and forces to the birth of the universe. As one of the physicists who works with the enormous detectors that record the collisions of the Large Hadron Collider, Freya will not only convince you that particle physics is necessary and interesting for everyone (including tax payers), but also on the fun and social aspects of this exceptional human effort to understand the building blocks of matter.

Freya Blekman is a lead scientist at the German physics laboratory DESY and a Helmholtz Distinguished Professor of Physics at the University of Hamburg. She holds additional chairs as guest professor at Oxford University and Vrije Universiteit Brussel. She works at CERN, where she uses the data from the Large Hadron Collider, collected with the enormous Compact Muon Solenoid (CMS) experiment, to search for undiscovered physics processes and new particles. Blekman is also responsible for the communication to the outside world of the 130+ papers per year by the 3000+ person strong CMS Collaboration and has won multiple prizes for her science and for science communication.





31.3 QUANTUM SCIENCE, TECHNOLOGIES & QUANTUM COMPUTERS

Professor Tristan Farrow
University of Oxford

This lecture will introduce the quantum nature of light (particle-like) and matter (wave-like), of quantum superposition and entanglement, and before re-imagining how these powerful concepts can be used to build revolutionary devices, from quantum sensors and computers and even to teleport information! Illustrated with examples of the latest discoveries.

Tristan Farrow leads the Quantum Devices and Biosystems Group at the Department of Physics at Oxford University, where he is developing technologies that use quantum physics to enable quantum communication, sensitive detection, and quantum computing. He has pioneered quantum-light sources that use quantum dots and has developed single-photon LEDs at telecommunication wavelengths for quantum cryptography and photonic quantum information processing. His theoretical work covers quantum algorithms simulating physical effects in bio-molecules, which he implements on quantum computers in partnership with colleagues at IBM. Tristan co-founded in 2012 an interdisciplinary programme in quantum bioscience on Bio-inspired Quantum, the first of its kind in the UK, paving the way for other interdisciplinary research programmes in this new field. Tristan is leading the creation of a new Masters in Quantum Technologies at the University of Oxford, launching in 2025. Tristan is a Media Fellow of the British Science Association and has been an active science writer for over a decade, contributing articles to The Independent, The Guardian, and has had his research covered in Scientific American, New Scientist, and Discover Magazine.



31.4 AI IN STEM: UNLOCKING POTENTIAL & NAVIGATING RISKS

Dr Howard Haughton
King's College London

Artificial Intelligence (AI) is revolutionising the fields of Science, Technology, Engineering, and Mathematics (STEM), offering unprecedented opportunities and posing significant challenges. In this talk, we will explore how AI enhances research capabilities, accelerates innovation, and opens new frontiers in STEM disciplines. Conversely, we will also delve into the potential threats, such as ethical dilemmas, data privacy concerns, and the risk of widening the digital divide. By examining both sides of the coin, we aim to foster a balanced understanding of AI's role in shaping the future of STEM, preparing the next generation to harness its power responsibly.

Dr. Howard Haughton is an expert in quantitative financial risk with a focus on computational finance. He is a Senior Visiting Research Fellow at Kings College London. He is the EDI (Equity, Diversity & Inclusion) Champion at the Institute of Mathematics and Chair of Sporting Equals the UK's leading organisation for racial equality in sports. He has a PhD in Mathematical Computer Science and worked in risk and capital markets across prominent institutions, including JP Morgan Chase, Deutsche Bank, Merrill Lynch, and Dresdner Bank AG. He has provided advisory services to government bodies and other organisations on sustainable development, leadership, corporate governance, diversity, and inclusion.



31.5

CRITICALITY - THE STUDY OF SELF-ORGANIZATION

Enrico Caprioglio – LIYSF 2016
University of Sussex

In 1987, Bak, Tang, and Wiesenfeld proposed the theory of Self-Organised Criticality to explain the emergence of complexity and fractals in nature. From earthquakes and avalanches to brain dynamics and evolutionary ecology, in this lecture, we will explore the fundamentals of criticality and how concepts that stem from physics have been used in recent years to shed light on the emergence of complexity in the macroscopic world we live in. In particular, we will deep dive into the critical brain hypothesis, a statistical physics theory of how our brains may function.

Enrico Caprioglio was born in Italy and, after participating in the 2016 LIYSF, he moved to the UK to study Physics. He earned his theoretical physics undergraduate and master's degrees at UCL and Imperial College London, where he specialized in quantum information theory and the theory of complexity. During these years, he returned to LIYSF as a staff member for 6 years, and co-authored a Classical Mechanics textbook published by the Institute of Physics. He is now finishing his PhD at the University of Sussex, where he uses complexity theory and computational modeling to try to understand brain function and organization.



31.6

TACKLING THE CLIMATE & BIODIVERSITY CRISIS RIGHT NOW

Professor Becky Parker – LIYSF 1978
Queen Mary, University of London

We have established project earth - an affiliate partner to the Earthshot Prize. This supports school aged students across the world to innovate and bring about social transformation to care for the planet. We have brought together a number of eminent advisors from across the world including Professor Michael Mann and Professor Lorraine Whitmarsh. These advisors support the vision to empower and give agency to young people. Young people - that's you at LIYSF - have incredible creativity and imagination. We want to support you to bring your ideas to fruition and have agency to create a better future. This session will involve you learning the science and interrogating papers about specific challenges involved in energy transition, carbon capture, fusion, social transformation needed for building a better world. You will be trained on the MIT Climate Interactive En-ROADS simulator and equipped with insights from the Climate Reality leadership programme. You will have tackled the science, the challenges and then can consider solutions to present and share. It would also be brilliant if you might be ambassadors to spread the vision of project earth, aiming to empower all young people.

After a physics degree and research at the University of Chicago, Dr Parker taught in a variety of schools and found when she offered genuine research opportunities to her students they thrived in the subject. She has supported students to work with the UK Space Agency and NASA putting a payload in space, and have developed many research projects with CERN, the Wellcome Trust, universities, and research institutes. She is now working to support and release the potential of students to contribute to tackling the climate crisis. She is a Visiting Professor in the School of Physics and Astronomy at Queen Mary, University of London.

**31.7****X-RAY VISION: BEYOND
BLACK & WHITE****Dr Charlotte Maughan Jones**
University College London

Doctors have used x-rays to peek inside our bodies since Wilhelm Roentgen's first x-ray in 1895, but the technology has barely changed—until now! Join this interactive and practical lecture to discover how hospital x-ray images are made, their limitations and risks, and the latest breakthroughs in x-ray imaging. Plus, learn what rainbows have to do with the future of detecting and monitoring diseases like breast cancer. Get ready for a colourful journey into the future of medical imaging that's as fun as it is informative!

Charlotte began her career as an equine veterinarian in 2011 but soon became frustrated with the available imaging tools. This led her to pursue a career in medical imaging research. After earning her PhD in 2019, she has been at the forefront of developing innovative techniques for visualizing biological tissues using x-rays. Charlotte is a Research Fellow at the Department of Medical Physics and Biomedical Engineering at University College London. Outside the lab, Charlotte is dedicated to science communication, sharing her knowledge through articles, YouTube videos, and podcasts. She excels at making complex scientific concepts accessible and engaging, particularly for young children.

31.8**ANTIMICROBIAL RESISTANCE:
THE SILENT PANDEMIC?
WHY YOU SHOULD CARE****Professor Diane Ashiru-Oredope**
UK Health Security Agency

In 2019, the World Health Organization declared antimicrobial resistance (AMR), one of the ten global health threats facing humanity. The COVID-19 pandemic has given us an example of how life without effective treatment for an infection could be. Although a couple of treatment options have been found useful in the management of the infection in hospitalised patients, the best measure for COVID-19 and infections caused by microorganisms resistant to medicines is to prevent the infection in the first instance. In this lecture, you will find out the scale of the problem and what you can do to protect yourself, your family, friends and future patients (if you go on to become a healthcare professional) against the spread of antimicrobial resistance.

Professor Diane Ashiru-Oredope, a Credentialed Consultant Pharmacist is the Lead Pharmacist for the Antimicrobial Resistance and Healthcare Associated Infections at UK Health Security Agency, Deputy Chief Scientist for Royal Pharmaceutical Society and Honorary Chair & Professor of Pharmaceutical Public Health at University of Nottingham. Diane has led/contributed significantly to several projects that have shaped national and international policy in tackling antimicrobial resistance, including Start Smart then Focus, Antimicrobial Prescribing and Stewardship Competences, WHO policy guidance on integrated antimicrobial stewardship activities and creating the global Antibiotic Guardian campaign in 2014. From 2016 until March 2022, she was advisor and Global AMR lead for the Commonwealth Pharmacists Association. She is research active, successfully leading or significantly contributing to more than 100 peer-reviewed publications, and has delivered several invited presentations nationally and globally and written several blogs, newspaper articles and editorials.



ALUMNI SPECIALIST LECTURES - 2ND AUGUST



2.1

MOVING TOWARDS TREATMENTS FOR DEMENTIA & MOTOR NEURON DISEASE

Dr Rubika Balendra – LIYSF 2003

University College London Hospital

The health and socioeconomic burden of dementia is vast, and will only increase over the next few decades. Motor Neuron Disease is a devastating neurodegenerative disease which affects one in 250 people. How will we move towards finding treatments for these diseases? This lecture will discuss recent developments in this field of neurodegeneration with a focus on using genetics to drive forwards our understanding of mechanisms and therapeutics. We will discuss novel disease models, including human stem cell-derived neurons and fruit flies, as approaches to investigate clinically applicable pathways in neurodegeneration.

Rubika is a Specialist Registrar doctor in Neurology in London. She completed a PhD as a Wellcome Trust and UCL Leonard Wolfson Research Training Fellow investigating motor neuron disease and frontotemporal dementia at the UCL Institute of Neurology. She read medicine at Cambridge University and UCL. She trained in clinical and academic medicine as an Academic Clinical Neurosciences Foundation Trainee at Cambridge University. She continued clinical and academic training as an Academic Clinical Fellow at King's College London. She enjoys teaching science and medical students and is actively involved in public engagement in science. She was an LIYSF participant in 2003 and a staff member from 2004-2007.

2.2

THE IMPACT OF HYDROGEN FUEL TECHNOLOGY

Maurice Brown – LIYSF 1986

Utrecht University, The Netherlands

The Hydrogen fuel cell has been around since 1839. This relatively obscure, but highly valued technology, helped power the United States 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. How does this technology work, what are its applications and what problems does it face as an industry?

Maurice Brown is from Kingston, Jamaica, studying at Campion College and the College of Arts Science and Technology. He moved to the Netherlands in 1994 and completed his Bachelor's degree in International Business Administration and Master's Degree in Business Management. 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.





2.3

BLOOD CANCERS & HARNESSING THE IMMUNE SYSTEM TO TREAT THEM'

Dr Kate Cwynarski – LIYSF 1983

University College Hospital, London

Dr. Kate Cwynarski attended LIYSF in 1983 and has so many fantastic memories from those two weeks in London. Her talk will look to her work as a blood cancer doctor specialising in Lymphoma and Immunotherapy at University College Hospital, London. The lecture will cover the many impressive developments and discoveries made over the last 30+ years that have revolutionised the treatment options available for patients. Kate works closely with many other colleagues working in organ transplantation, immunodeficiencies and neurosurgery and will also discuss insights gained from their collaborative working. COVID has also had a huge impact on the care of patients. Kate in her own words, "feels privileged to work in this field and I'm grateful for the inspiration I gained in the summer of 1983".

Dr. Kate Cwynarski is a Haem-Oncologist specialising in Lymphoma and chronic lymphoid leukaemia at University College London Hospital, London, UK. She trained at King's College, Hammersmith Hospital and Royal Free Hospital, London UK and received her MRC-funded PhD in immunology at Imperial College, London, UK. Her sub-specialist interests include Central Nervous System Lymphoma, HIV-related lymphoma, Post-transplant lymphoproliferative disorders and CAR-T. She leads the UK CNS Lymphoma Group and is a member of the British Society of Haematology Lymphoma Specialist Interest Group and National Cancer Research Institute Lymphoma Clinical Studies Group. She is involved in many clinical trials and has lead and co-authored BSH, EHA and BHIVA guidelines for the management of SCNSL, PCNSL, CNS prophylaxis, T cell lymphoma and primary mediastinal B cell lymphoma. She has co-authored > 120 journal articles.

2.4

SPINOCEREBELLAR ATAXIA TYPE 7, A RARE DISEASE WITH A RARE NAME

Aranza Meza Dorantes – LIYSF 2016

ITESM, Mexico

To have a rare disease is to battle the illness and a world that doesn't understand. Spinocerebellar ataxia type 7 (SCA7) is a disabling neurodegenerative disorder characterized by a progressive decline in motor skills and vision impairment. Classified as a rare disease, it has a global prevalence of only 1 in 100,000. Despite evidence of impaired neuroglial transcription, human-specific data remains lacking. In this conference, we will explore different perspectives to address this gap and how the development of new functional analyses can not only shed light on the intricate mechanisms underlying the disease but also identify potential therapeutic targets.

Aranza is a PhD candidate at ITESM, Mexico, specialising in molecular biology. She attended the London International Youth Science Forum in 2016 and subsequently on the student staff team for many years. Her research focuses on ataxias and neurodegenerative diseases, particularly transcriptional modifications, and their impacts at the cellular level. With a degree in Biotechnology Engineering, she bridges disciplines, ranging from air quality improvement through her project de ella, Clair, to bioinformatics and social project implementation. Aranza advocates for the synergy of diverse fields to enhance community impact, guided by her belief that all disciplines can uniquely contribute to each project and enrich its human aspect. She participated at the London International Youth Science Forum (LIYSF) in 2016 and served on staff for three subsequent years.





2.5 DECOMMISSIONING THE JOINT EUROPEAN TORUS

Jameer Emamally – LIYSF 2003
UK Atomic Energy Authority

The Joint European Torus (JET) is an experimental fusion tokamak, capable of operating with deuterium-tritium (D-T) plasmas, located at the Culham Campus, the home of UK Atomic Energy Authority in Oxfordshire. After 40 years of record-breaking fusion research the JET machine has ceased to operate in December 2023 and has transitioned to decommissioning. This phase requires reuse of existing and new capabilities such as dismantling and size reduction of the JET machine, processing the associated waste streams (including Intermediate Level Waste and Low Level Waste), consignment of waste material from site and repurposing existing facilities. This presentation explores how JET Decommissioning is delivered in a safe and innovative manner while demonstrating maximum value for money and a close loop fuel cycle.

Jameer Emamally is a seasoned chartered lead engineer responsible for engineering decommissioning and handling with a passion for innovation and problem-solving. With over 15 years of experience in the high integrity-high hazard engineering industry, Jameer has led cross-functional teams in developing regulatory compliant cutting-edge solutions. His expertise spans nuclear facility design and safety. Jameer holds a Master's degree in Aeronautical Engineering from Imperial College. He shares his knowledge as a guest speaker and mentors new engineers to achieve Chartership. In his free time, Jameer enjoys travel, swimming and working with other organisations define major projects.



2.6 BORN PROTECTED: THE SCIENCE OF MATERNAL IMMUNITY TRANSFER

Dr Émer Hickey - LIYSF 2014
University of Exeter

Have you ever wondered how newborns are protected from infections right after birth? As placental mammals, pregnant women and their foetuses share an incredible connection during pregnancy, allowing the transfer of vital immune components. This fascinating process doesn't stop at birth; it continues through breastfeeding, providing newborns with crucial protection while their own immune systems are still developing. In this session, you will discover how immunity is transferred from mother to child during pregnancy and nursing. We'll dive into the transfer of immune cells, explore the intriguing development of microchimerism, and discuss how these processes help control infections in early life. Additionally, we will examine the emerging role of maternal vaccinations in extending neonatal immunity.

Dr. Émer Hickey is a Postdoctoral Research Fellow at the MRC Centre for Medical Mycology at the University of Exeter. Her research in the Horsnell Group focuses on understanding maternal immunity and its impact on mucosal infections caused by fungi, helminths, and bacteria. Émer first attended LIYSF as a student in 2014, where her enthusiasm for science flourished. She later returned as a staff member and served as Chief of Staff from 2019 to 2023. Today, she continues to contribute to LIYSF as a Scientific Advisor. In 2013, Émer and her teammates secured the top prize at BT Young Scientist and Technology Exhibition (BTYSTE). Subsequently, the team represented Ireland at the European Union Contest for Young Scientists and the Google Science Fair, securing first place in both competitions. TIME magazine recognized Émer as one of the most influential teenagers globally. Throughout this period, she regularly spoke at outreach events such as WeDay, the Do Lectures, and Wired UK. Additionally, she presented a STEM documentary in collaboration with Coca Cola and VICE.



2.7

IS THIS MY HEART?

Dr Tom Ingram – LIYSF 1993

Royal Shrewsbury Hospital

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 look at the pathology, the treatment 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. 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 is a Consultant Cardiologist working in the West Midlands region of the United Kingdom. He 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. He was an attendee at the science forum in 1993 and then returned as a member of staff for four years.

2.8

FUTURE-PROOFING OUR PLANET: THE RISE OF INDUSTRIAL CLIMATE TECH

Simran Mohnani – LIYSF 2013

Deloitte UK

Climate intrapreneurship is about exploring alternative models to entrepreneurship; building green solutions in-house within a company's corporate venture labs, otherwise known as 'the innovation arm of the business'. Join Simran as she discusses how to build climate inventions, prototypes, MVPs (minimum viable products) and ventures by bringing together industry, academia and startups to decarbonise high-emitting sectors. Simran has worked across the innovation lifecycle: from designing bioreactors for cultured meat in R&D labs, to automating chocolate-cooling at the Cadbury chocolate factory, and digitising COVID-19 vaccine manufacturing to make factories go 'paperless'. This lecture will cover novel examples of industrial climate tech in our pursuit of Net Zero and how to build industrial green innovations at different scales.

Simran is a Chemical Engineer, Industry4.0 Consultant and ClimateTech Intrapreneur who leads Circular Economy Innovation for Deloitte UK. Prior to this, she has worked across R&D, manufacturing and consulting in designing net-zero manufacturing systems of the future: from cultured meat scaleup to lean chocolate-making and digitised COVID-19 vaccine production. She was the Malta 2013 delegate to LIYSF and credits the forum with her love and discovery of Chemical Engineering. Also a STEM ambassador, student mentor and panel speaker, she is internationally recognised for her work championing women in tech and engineering, and now serves as a One Young World ambassador, World Economic Forum Global Shaper, and UN Women volunteer in championing youth voices on climate action and educational access. She has been recognised as one of the UK's TechWomen100, JCI Malta's Top 10 under 40, Salters' Top 5 UK Chemical Engineers and the UK's Asian Woman of Achievement, and this year will be moving to the University of Stanford to pursue her MBA as an elected Fulbright scholar.



SPECIALIST LECTURES - 5TH AUGUST



5.1

GROWING ARTIFICIAL LIVING TISSUES TO STUDY & HEAL THE HUMAN BODY

Dr James Armstrong
University of Bristol

The human body is a collection of specialised tissues, such as bones, muscles, skin, and brain. These tissues have highly evolved structures that enable them to perform different complex tasks. Unfortunately, all tissues are susceptible to disease, damage or ageing, and there are many cases for which modern medicine does not yet have an answer. Our laboratory is approaching this problem by growing artificial living tissues in the laboratory. The intention is that these artificial tissues can be used as living implants or as models to study how our body becomes diseased and responds to drugs. In this specialist lecture, I will describe the progress made by my laboratory and others in achieving this goal.

Dr James Armstrong is a Senior Research Fellow working in the Department of Translational Health Sciences at the University of Bristol (www.TheArmstrongGroup.co.uk). His research has been supported by three personal Fellowships: Arthritis Research UK (2015-2018), the Medical Research Council (2018-2021), and now a prestigious UKRI Future Leaders Fellowship (2021-2028). These major funding awards have enabled him to lead a programme of highly interdisciplinary and collaborative research focussed on using biomaterials, nanomaterials, and remote fields to engineer artificial tissues with structural and functional complexity. He is now expanding his research interests into engineering stem-cell-derived organoids while also seeking to translate his technologies for applied biological modelling and regenerative medicine.

5.2

HOW ORGANIC SOLAR CELLS WORK & HOW TO MAKE THEM EVEN BETTER

Professor Tracey Clarke
University College London

The performance of organic photovoltaic (OPV) devices has drastically improved over the last few decades, but with climate change at the forefront of the world's attention, the development of this sustainable energy solution is now more important than ever. Organic photovoltaics are remarkably close to reaching a landmark power conversion efficiency of 20%. Despite this, they still suffer from several important loss mechanisms. In this lecture, Dr Tracey will explain how organic solar cells convert light into electricity, and how current research is tackling these loss mechanisms to further enhance efficiencies.

Dr Tracey Clarke is an associate professor in the Department of Chemistry at University College London. She did her PhD at the University of Otago in New Zealand, following this with postdoctoral work at Imperial College London and a research fellowship in Australia. She specialises in spectroscopy and photophysics, researching structure-function relationships in organic conjugated materials for optoelectronic applications.





5.3 STRATEGIES FOR DESIGNING “REPLACEMENT PARTS” FOR THE NERVOUS SYSTEM

Professor Timothy Denison
University of Oxford

The total economic cost of neurological disorders exceeds £100B per annum in the UK alone. The emerging field of bioelectronic medicine provides an opportunity to use electronic hardware and software to intelligently sense and stimulate the nervous system, and thereby treat disease. I will summarize the challenges and opportunities of developing bioelectronic systems face that bridge basic science, regulated technology, and health care economics. This assessment motivates an innovation framework that leverages the unique capabilities of bioelectronic platforms -- from designing implantable scientific instruments that enable novel clinical neuroscience, to applying the resulting science to prototype new therapies. To provide an illustrative example of the innovation framework, I will highlight experiences from the “Picostim-DyNeuMo,” which is a collaborative, investigational research tool developed jointly by industry and academics. This system is targeting first-in-human clinical studies exploring challenging neurological disorders such as epilepsy, chronic pain, and disorders of consciousness.

Professor Tim Denison explores the fundamentals of physiologic closed-loop systems and how to apply this understanding to the treatment of disease. Tim serves also as an advisor to several governments and industry boards helping to define strategies for mapping scientific discovery to product development roadmaps within the regulatory and economic constraints of medical systems. Prior to joining Oxford, Tim was a Technical at Medtronic, where he helped oversee the design of next generation neural interface and algorithm technologies for brain machine interfaces. He has an MS and PhD from MIT in electrical engineering, an AB in Physics and MBA from the University of Chicago.



5.4 MACHINE LEARNING

Dr Hong Ge
University of Cambridge

This lecture delves into the core methodologies of machine learning with a particular emphasis on Bayesian Inference. This lecture will explore the theoretical foundations of Bayesian Inference, illustrating how it provides a systematic framework for modeling uncertainty, enhancing decision-making, and refining predictive analytics. Key topics include Bayesian nonparametrics, which allow for flexible model structures that adapt to data, and the practical implementation of these concepts through probabilistic programming. Attendees will gain a deep understanding of how Bayesian methods are applied to solve complex problems in machine learning, from algorithm development to real-world applications. Dr. Ge will share insights from his cutting-edge research, demonstrating how Bayesian techniques can lead to more accurate and reliable models.

Dr Hong Ge is a Senior Research Fellow in the Department of Engineering at University of Cambridge where he completed his PhD. He also leads the Turing.jl team. His research work revolves around developing foundational methodologies for machine learning and intelligence, with a focus on Bayesian Inference, decision-making and Bayesian nonparametrics. At The Alan Turing Institute, his research focuses on probabilistic programming.



5.5

GETTING TO ZERO: ENDING HIV TRANSMISSION, AIDS, & HIV-RELATED DEATHS BY 2030

Samm Kabagambe
Gilead

The "Getting to Zero" target is a global initiative by UNAIDS to end the HIV epidemic by achieving zero new HIV infections, zero AIDS-related deaths, and zero discrimination. There has been significant progress in the management of HIV, with treatments meaning people with HIV can live long, fulfilled lives, and cannot pass the virus onto their sexual partners when on effective treatment. Despite this, challenges like stigma and healthcare disparities remain. This talk will introduce you to key strategies and concepts of this initiative including HIV prevention through education and PrEP; routine and community-based testing for early diagnosis and universal access to antiretroviral therapy and holistic care. Future efforts will focus on innovation, integrating HIV services, and enhancing global cooperation to sustain and scale up initiatives towards eliminating HIV as a public health threat.

Samm Kabagambe was born and raised in Uganda and spent most of his career working in the UK National Health Service. He is a specialist HIV and infectious diseases pharmacist working in the medical team at Gilead Sciences. They are a global biopharmaceutical company with ambitions to create a healthier world for all people. They develop innovative medicines for life-threatening diseases and partner with a variety of organizations to reach the communities most in need of improved access to care. In his free time, he enjoys travelling, especially for food experiences, sports (boxing and cricket), chess, music festivals and serving as drummer and singer for the local church.



5.6

SLEEP ENGINEERING FOR HEALTH & COGNITION

Professor Penelope Lewis
Cardiff University

This lecture will talk about ways that we can tinker with our sleep though a new science of sleep engineering. The aim of this science are firstly to better understand sleep and why it is important, and secondly to improve health (for instance slowing the ageing process) and cognition (for instance boosting memories and reducing negative emotions). There is also evidence that sleep engineering could facilitate creative processes like extraction of gist from a corpus of information or forming novel links. In this talk I will introduce sleep and show what we can do to it with sleep engineering. I will also talk about potential future applications of sleep engineering to clinical problems.

Penny Lewis is a Professor of Neuroscience at Cardiff University. She is interested in ways to manipulate sleep to improve health and cognition, with a current focus on Depression and PTSD. Her work investigates the impacts of triggered memory replay during various sleep stages on memory consolidation, emotional processing, and creativity. Penny did her DPhil in Oxford then moved to the Functional Imaging Lab at UCL for a postdoc. After a sojourn producing science radio programmes in New Zealand, she took up a lectureship in Liverpool, and moved to Cardiff in 2016, and now heads up the NaPS lab in CUBRIC.



5.7

ICE, OCEAN, & ATMOSPHERE: UNRAVELLING THE BUILDING BLOCKS OF OUR CLIMATE

Dr Marilena Oltmanns

National Oceanography Centre

Melting ice sheets, record ocean temperatures, unprecedented flooding and droughts: An increasing occurrence of extremes in ice, ocean and atmospheric conditions raises questions about their causes, connections, and climate impacts. Building on observations, models, and theory, this lecture will present drivers of change in the climate system with a focus on the Arctic – North Atlantic sector. It will also provide inspirations for new ideas to identify mechanisms, design models, and predict our future weather and climate on timescales from seasons to multi-decades.

Marilena Oltmanns is an ocean and climate physicist at the National Oceanography Centre in Southampton. She completed her PhD at Massachusetts Institute of Technology and Woods Hole Oceanographic Institution in the US and then worked at GEOMAR, a large ocean research institute in Germany, before coming to the UK. Her research centres around the role of the ocean in the climate system with a specific focus on extreme events and rapid climate change.



5.8

FUNGAL PATHOGENS, IGNORE ME AT YOUR PERIL!

Dr Jane Usher

University of Exeter

Despite their huge impact, fungal infections remain understudied and under-diagnosed compared with other infectious diseases and there is a pressing need for more research in this field. In my talk I will introduce you to some of the major fungal species that are a threat to human health, discuss how they can outsmart the human immune system and cause disease. The emergence of resistance to antifungal drugs is of considerable concern for the effective treatment of these fungal infections, I will present data on the fundamental insights in understanding the evolution, prevalence and mechanisms of antifungal resistance.

Jane Usher studied Biology and Statistics at the National University of Ireland, Maynooth before completing a MSc in Molecular Medicine in Trinity College Dublin, she then started her PhD under the mentorship of Prof Ursula Bond in the Dept of Microbiology, TCD, Ireland studying the Analysis of genome organisation and gene expression of brewery strains of yeast. From here she moved to the Institute of Systems Biology at the University of Ottawa, ON, Canada to undertake a postdoctoral research position on genetic engineering of yeast strains for biofuel production. Jane moved to the University of Exeter in 2011 and began working on *Candida glabrata*. In 2018, she joined the MRC Centre in the group of as a senior scientist. In 2022, she was awarded a BBSRC Discovery Fellowship to begin her independent research on combatting resistance to combinatorial stress in *Candida glabrata* and in April 2023 was made a Senior Lecturer in Medical Mycology.

FRIDAY 26TH JULY

26.A Association Of Anaesthetists Of Great Britain & Ireland

Founded in 1932 by Dr Henry W Featherstone, The Association of Anaesthetists of Great Britain and Ireland (AAGBI) represents the medical and political views of over 11,000 anaesthetists in the UK, Ireland and internationally.

26.B Centre for Gene Therapy & Regenerative Medicine. King's College London

Based inside Guy's Hospital, the centre's research environment is enriched by expertise in pluripotent and adult tissue stem cells and includes researchers studying a range of diseases such as diabetes, skin fibrosis and acute liver failure.

26.C Chelsea Physic Garden

Since 1673 Chelsea Physic Garden has occupied four acres of land on the edge of the Thames. First established by the Apothecaries in order to grow medicinal plants, this extraordinary garden in London has had wide reaching impact around the world.

26.D Health Services Laboratory

Health Services Laboratories provide pathology services to both the NHS and private healthcare, combining the Doctors Laboratory's long standing specialist pathology expertise, with the Royal Free London and UCLH's internationally recognised heritage of continual research, development and academic excellence.

26.E Imperial College London, Department of Aeronautics

Develop next-generation aerial robots. Use computers to solve complex fluid flow problems. Turning ideas into impact is what we live for at Imperial.

26.F Imperial College London, Department of Electrical Engineering / Energy Futures Lab

The Energy Futures Lab is the focal point for the dynamic and diverse multi-disciplinary energy research across Imperial College London. We enable funding, training and global partnerships for our researchers and students.

26.G Imperial College London, Department of Life Sciences

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

26.H Imperial College London, Department of Mechanical Engineering

Mechanical engineering is at the forefront of revolutionising technology through innovations in robotics, sustainable energy, advanced manufacturing, and smart systems. The Department of Mechanical Engineering at Imperial College delivers research across a wide range of topics and academic disciplines, including applied mechanics, mechanics of materials and thermofluids.

26.I London Metropolitan University – Science Centre

£30 million science centre which is home to the Superlab, a state-of-the-art teaching lab with room for 280 students. The four-floor science centre also houses modern research labs for HIV and microbiology research, as well as a forensic science lab and nmr spectrometer.

26.J 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.

LONDON SCIENTIFIC VISITS

26.K 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.

26.L The Royal Institution

The Royal Institution (Ri) is an independent charity dedicated to connecting people with the world of science with over 200 years of history. At the L'Oreal Young Scientist Centre students will undertake a magnets and motors workshop, seeing a demonstration of Faraday's original electric motor and then building a simple battery powered motor that uses similar principles.

26.M St. George's University Hospitals, Interventional Radiology

St. George's Hospital, having close to 8,500 dedicated staff caring for patients around the clock, serve as one of the largest healthcare provider in southwest London. The Interventional Radiology Department, within the hospital, offers a wide range of vascular and non-vascular minimally invasive image guided procedures. It is internationally renowned for its expertise and top-class research.

26.N 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.

26.O University College London, Faculty of Engineering

The Engineering Faculty is uniquely international. Our students and staff join us from over 120 nations – as do our academic and business partners. Our teaching programmes are designed to engage students and give them the skills to address the world's challenges. We have pioneered new teaching methods for undergraduates and involve our postgraduates with our cutting-edge, highly-rated academic research. The graduates we educate progress to a wide range of roles, within engineering and technology sectors and beyond.

TUESDAY 30TH JULY

30.A Airbus UK

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

30.B Animal & Plant Health Agency (APHA)

The Animal and Plant Health Agency (APHA) is the UK Government agency responsible for animal, plant and bee health. APHA are responsible for; identifying and controlling endemic and exotic diseases and pests in animals, plants and bees, and surveillance of new and emerging pests and diseases; scientific research in areas such as bacterial, viral, prion and parasitic diseases and vaccines, and food safety; and act as an international reference laboratory for many farm animal diseases.

30.C University of Bath, Department of Life Sciences

A brand new department offering a range of Biosciences and Biomedical degrees, including accredited Pharmacy degrees. Cutting-edge multi-disciplinary research spans human health to environmental sustainability and utilises bioengineering technologies and big data approaches.

30.D University of Birmingham, School of Civil Engineering

The School of Civil Engineering at University of Birmingham tackles the problems faced by society today, aiming to develop the knowledge and tools to build the communities of the future. The School supports research on core themes of Transport, Resilience and Sustainability. The performance of Civil Engineering in the Research Excellence Framework is ranked in the top 10 for Engineering research in the UK for GPA and 4* research (REF 2021).

30.E University of Bristol, School of Anatomy

The School of Anatomy (SoA) is committed to delivering exceptional anatomy teaching and resources. The Vesalius Clinical Training Centre is a vital enterprise of the School of Anatomy which hosts advanced and specialist courses in surgical skills.

30.F University of Essex, Human Performance Unit

The Human Performance Unit based in the University of Essex's state of the art Sports Science laboratories, provides physiological testing, nutritional support and body composition assessments to athletes looking to improve their performance. Further to their work with athletes from outside of the University, the HPU Sports Scientists also work closely with Performance Sport athletes from the University's three Performance Sports of Rugby 7's, Volleyball and Basketball. Athletes in these sports from all over the world are attracted to Essex University due to the high calibre coaching and sports science services offered to the teams.

30.G 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.

30.H University of Kent, Chemistry and Forensic Science

World renowned facilities at the Chemistry and Forensic Science Departments. More than 92% of their Chemistry research outputs and 100% of their research impact was considered to be world-leading or internationally excellent in the Research Excellence Framework (REF) 2021.

30.I McLaren Technology Centre

The McLaren Technology Centre is home to the McLaren Group, consisting of McLaren Racing and McLaren Automotive. McLaren Racing competes in five racing series: Formula 1, INDYCAR, Formula E, Extreme E, and F1 Sim Racing. At the MTC, we primarily focus on F1. The F1 team consists of Technical, Operations, Race Team, Central Services and Commercial - all of which contribute to our success in races.

NATIONAL SCIENTIFIC VISITS

30.J National Space Academy

National Space Academy delivers a programme that uses inspirational contexts from across space science, exploration, astronomy and satellite applications.

30.K 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.

30.L University of Southampton, School of Electronics & Computer Science, Faculty of Engineering and Physical Sciences

The School of Electronics & Computer Science at University of Southampton is a Centre of Excellence for Cyber Security Research and Education, with international reputation for research. The subjects addressed by their research include digital libraries, artificial intelligence, machine learning and web science.

30.M University of Sussex, School of Life Sciences

Sussex has world-changing impact in many areas, including renewable energy, drug design and quantum chemistry. Biology is for those who are curious about the natural world and who want to understand the past, present and future of life on Earth, seeking solutions to some of the most important problems facing humanity – from managing environmental change to controlling disease.

THURSDAY 1ST AUGUST

1.A BMW Mini Plant Oxford

Experience production and take a look behind the scenes with our experts. The products made by BMW Group inspire with unique design, dynamic and agility. It is exciting and fascinating to experience live production.

1.B University of Cambridge, Human Anatomy Centre, Department of Physiology, Development and Neuroscience

Human dissection at Cambridge dates back over 450 years in colleges such as Gonville & Caius, and Magdalene, and 2016 marked the 300th anniversary of the establishment of the Anatomy School in Queens' Lane in 1716. Today, Cambridge continues to offer students the irreplaceable experience of full-body dissection in the Functional Architecture of the Body course. The Human Anatomy Centre is actively engaged in anatomical research in collaboration with clinicians and other specialists in Cambridge and at other institutions in the UK.

1.C University of Cambridge, Milner Therapeutics Institute

The Milner Institute provides a unique interactive and multifaceted environment for therapeutic innovation where academics, pharma and biotech work side-by-side. In the Milner, researchers are developing their own research programme and target discovery pipeline. The methods and approaches fostered are disease-agnostic and are currently applied in oncology, respiratory disease, metabolic disorders, infectious disease, inflammatory bowel disease and CNS diseases.

1.D University of Cambridge, Neuro Optics Lab

The Neuro Optics Lab is a multidisciplinary research group that operates jointly between the Department of Engineering and Department of Physics at the University of Cambridge that develops and validates new optical methods to monitor brain function and metabolism non-invasively. The lab focuses on near infrared spectroscopy (NIRS)-based methods to perform in-vivo monitoring of metabolic markers such as haemoglobin oxygenation, mitochondrial function and blood flow. Researchers at Milner are interested in pioneering tools and techniques to monitor relevant physiology for both basic science and medical applications, from developing wearable brain monitoring for dementia diagnosis and monitoring, to building new optical methods to measure seal physiology non-invasively.

1.E University of Cambridge, Scott Polar Research Institute

The Scott Polar Research Institute (SPRI) was founded in 1920, as a memorial to Ct. 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. Now part of the Geography Department at the University of Cambridge, SPRI's mission is to enhance the understanding of the polar regions through scholarly research and publication, educating new generations of polar researchers, caring for and making accessible its collections and projecting the history and environmental significance of the polar regions to the wider community.

1.F Culham Science Centre, UK Atomic Energy Authority

The Culham Centre for Fusion Energy (CCFE) is the UK's national laboratory for fusion research, owned and operated by the United Kingdom Atomic Energy Authority (UKAEA). CCFE hosts the world's largest magnetic fusion experiment, JET (Joint European Torus), on behalf of its European partners along with MAST (Mega Amp Spherical Tokamak), the UK's magnetic fusion experiment.

OXFORD & CAMBRIDGE SCIENTIFIC VISITS

1.G HR Wallingford

HR Wallingford has been involved in research and consultancy to solve water-related challenges worldwide for 70 years. The company has impressive physical modelling facilities which include seven wave basins, used to build and test scale models of ports, harbours and beaches. It also has numerous wave flumes, the largest of which, the Fast Flow Facility, can house a tsunami simulator, or be used to test the stability of renewable energy foundations. The company's UK Ship Simulation Centre offers virtual reality ship simulation, used for pilot training, but also as part of port and harbour design where simulating vessel navigation plays a vital role in the design process.

1.H MRC Cognition and Brain Sciences Unit, University of Cambridge

The MRC Cognition and Brain Sciences Unit is a research centre for advancing our knowledge of human cognition, with programmes that cover childhood development, mental health, ageing and dementias, neurological and sensory disorders, and fundamental cognitive neuroscience. As a Unit we also work together to address three Grand Challenges. First, to build models that bridge brain and mind. Second, to understand and support complex psychological and cognitive disorders. Third, to identify how people respond to adversity and how this response can be improved.

1.I University of Oxford, Oxford Botanic Garden and Arboretum

Our collections house over 5,000 plant species, some of which grow nowhere else. Join leading researchers and educators at Oxford Botanic Garden for insights into our interdisciplinary research and conservation during its 400th anniversary year.

1.J University of Oxford, History of Science Museum

The History of Science Museum houses an unrivalled collection of historic scientific instruments in the world's oldest surviving purpose-built museum building. By virtue of the collection and the building, the Museum occupies a special position, both in the study of the history of science and in the development of Western culture and collecting.

1.K The Oxford Museum of Natural History

Oxford University Museum of Natural History was established in 1860 to draw together scientific studies from across the University of Oxford. Today, the award-winning Museum continues to be a place of scientific research, collecting and fieldwork. Highlights in the collections include the world's first scientifically described dinosaur – *Megalosaurus bucklandii* – and the world-famous Oxford Dodo, the only soft tissue remains of the extinct dodo.

PROGRAMME VENUES

Blue Halls of Residence

Hall Host: James Robinson



Queen Alexandra's House



Prince's Gardens

Red Halls of Residence

Hall Host: Montserrat Hermosillo Ortiz



Metrogate House



Astor Hyde Park

Yellow Halls of Residence

Hall Host: Yousif Almazmi



Copthorne Tara Hotel

Programme Venues



Imperial College London

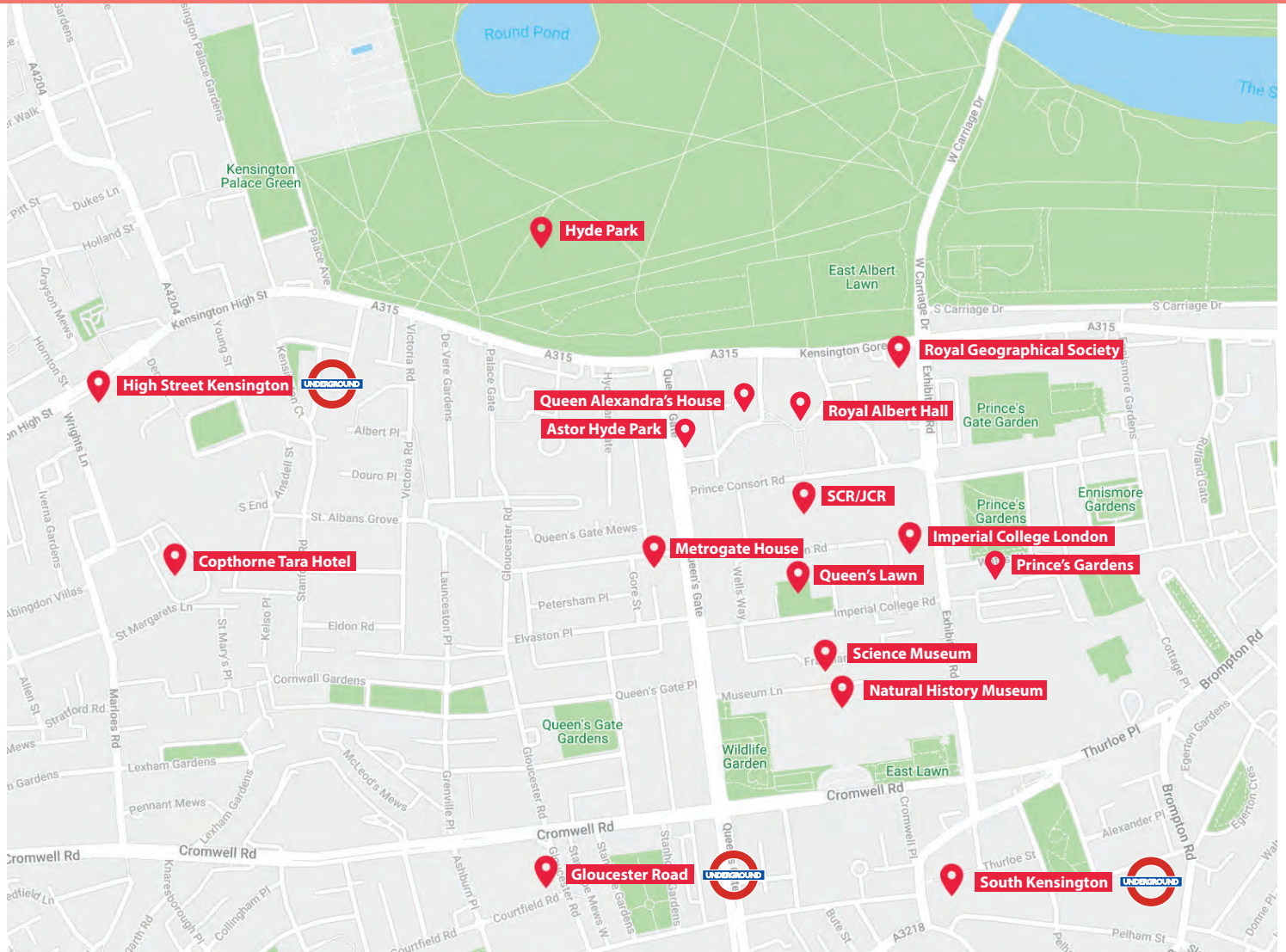


Royal Geographical Society



Copthorne Tara Hotel

LIYSF CAMPUS MAP



PARTNERS

LIYSF is proud to work in association with many world-wide organisations, some of these include:



SCHWEIZER JUGEND FORCHT

YOSA
YOUNG SCIENTISTS FOR AFRICA



AcrossAtlantic



Fondation Jeunes
Scientifiques
Luxembourg



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Director
England



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Programme Manager
Brazil



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Gustav Brochmann
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Minushika Punchihewa
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Dave Harris
Media Assistant
New Zealand



Moses Moloi
Videographer
South Africa



Siddhant Gupta
SEO Manager
India



Jeetendra Kumar
Developer
India

STAFF TEAM - HALLS OF RESIDENCE

THE BLUE HALLS OF RESIDENCE TEAM



James Robinson
Hall Host
UK



Bianca Ascheri
Academic Liaison
Italy



Candela Tejedo Raga
Deputy Host
Spain



Liam Carew
Counsellor
Ireland



Ching Chi Chu (Cher)
Counsellor
Hong Kong, China



Aayushi Ranjan
Counsellor
USA

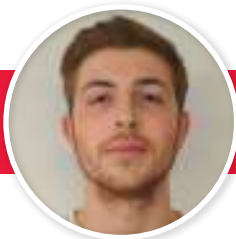


Rebecca Wambui
Counsellor
Kenya

THE RED HALLS OF RESIDENCE TEAM



Montserrat Hermosillo Ortiz
Hall Host
Mexico



Riccardo Caprioglio
Academic Liaison
Italy



Zoe Lubrano
Deputy Host
Argentina



Joseph Blake
Counsellor
UK



Milena Hayashi
Counsellor
Brazil

STAFF TEAM - HALLS OF RESIDENCE



Celeste Nutley
Counsellor
Australia



Ayomide Olusegun
Counsellor
Canada

THE YELLOW HALLS OF RESIDENCE TEAM



Yousif Almazmi
Hall Host
UAE



Jan Heinemann
Deputy Host
Germany



George Mbuthia
Counsellor
Kenya



Antonio Olsaretti-Bouhabib
Counsellor
Spain



Helen Taylor
Counsellor
UK

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, Foundations, 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:

Across Atlantic	<i>UK, Nigeria</i>	John Roan School	<i>England</i>
Akademie Foundation	<i>Poland</i>	Kolej Tuanku Ja'afar	<i>Malaysia</i>
ASDAN	<i>China</i>	Louisiana State University Laboratory School	<i>USA</i>
ASTRA DK	<i>Denmark</i>	Memorial University of Newfoundland	<i>Canada</i>
British Council School Madrid	<i>Spain</i>	Ministry of Education	<i>UAE</i>
British School of Brussels	<i>Belgium</i>	MOHERI	<i>Oman</i>
Brookhouse International School	<i>Kenya</i>	National Science and Technology Forum	<i>South Africa</i>
Campion College	<i>Jamaica</i>	National Science Museum (NSM)	<i>Thailand</i>
Cathedral and John Connon School	<i>India</i>	National Student Travel Foundation	<i>Malta</i>
Celia and Glyn Allen	<i>Guernsey</i>	National Youth Science Forum	<i>Australia</i>
China Association for Science and Technology	<i>China</i>	OKSEF / BUCA	<i>Turkey</i>
Club Ciencias	<i>Chile</i>	Polish Children's Fund	<i>Poland</i>
Dublin City University	<i>Ireland</i>	RED Science & Technology Youth Activities Network	<i>Mexico</i>
Engineering UK	<i>UK</i>	Rotary National Science & Technology Forum	<i>New Zealand</i>
English School	<i>Cyprus</i>	Stiftung Jugend Forscht	<i>Germany</i>
The Estonian Research Council	<i>Estonia</i>	Swedish Federation of Young Scientists	<i>Sweden</i>
Federazione delle Associazioni Scientifiche e Tecniche	<i>Italy</i>	Swiss Youth in Science	<i>Switzerland</i>
Foundation Jeunes Scientifiques Luxembourg	<i>Luxembourg</i>	Technologie & Innovation	<i>Austria</i>
University of Fraser Valley	<i>Canada</i>	Tomos Morgan Scholarship, Anglesey County Council	<i>Wales</i>
Fundació Catalunya-La Pedrera	<i>Spain</i>	The Senior School	<i>Cyprus</i>
GC School of Careers	<i>Cyprus</i>	Young Scientists for Africa	<i>UK, Africa</i>
Hungarian Association for Innovation	<i>Hungary</i>	Youth Science Canada	<i>Canada</i>
Igbinedion University Okada	<i>Nigeria</i>	Yuteh International School	<i>Taiwan (ROC)</i>

ACKNOWLEDGEMENTS

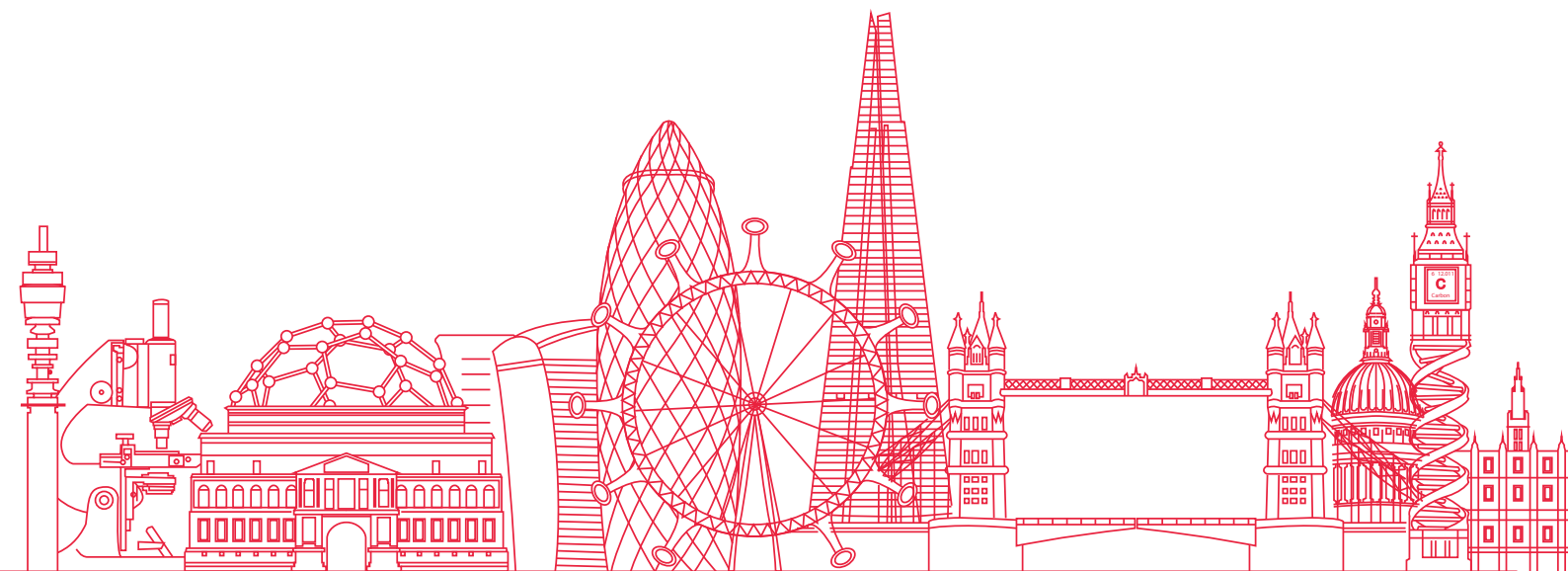
Our thanks to all those who assisted in the planning of LIYSF 2024. In particular, to the lecturers and speakers whose contribution is invaluable.

The universities, industries and research centres for their generosity in hosting visits to their establishments and providing virtual content. The Government departments, schools, colleges, universities, educational groups, science competitions and foundations worldwide, which select and sponsor overseas participation. Thanks to our Science Bazaar judges.

Thanks to our sponsors, Peter Brewer, Stephen Brosnan and Vanessa Smith in enabling LIYSF to continue.

Various individuals who provided much appreciated support and advice including; Ray Lewis, Stuart Marlow, Steve Martin, Ruta Matijosa, Claire McNulty, Glennis Myhill, Paul Myhill, David Nugent, Ailsa Sayers, Emmanuel Shofoluwe & Manuel Tapia.

Imperial College London, the Royal Geographical Society, Queen Alexandra's House, Metrogate House, Astor Hyde Park and the Copthorne Tara Hotel for hosting our students.



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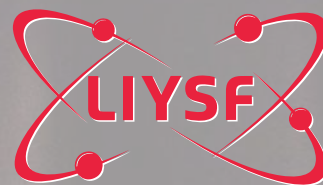
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THE NEXT EDITION OF LIYSF:

66TH LONDON INTERNATIONAL YOUTH SCIENCE FORUM

23RD JULY – 6TH AUGUST 2025



*Image: Nobel Prize Laureate, Professor Ben Feringa.
Delivering the Keynote address during the Opening Ceremony
at LIYSF 2023.*

LIYSF CIC, 85 GREAT PORTLAND STREET, LONDON, W1W 7LT, UK

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This year, the London International Youth Science Forum proudly marks its 65th edition with the theme, "Science Across Borders." Our front page illustration aims to capture the essence of global diversity, the unifying power of science and the intricate unique connections that bind us all together, symbolised by the 65th ceremonial blue sapphire diamond.