LIYSF

LONDON INTERNATIONAL YOUTH SCIENCE FORUM 2023

64TH LONDON INTERNATIONAL YOUTH SCIENCE FORUM

26TH JULY – 9TH AUGUST 2023

'SCIENCE FOR UNITY'

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]

President
Professor Clare Elwell: [2018 – Present]

Royal Patron
HRH The Princess Royal: [2020 – Present]

Science Patron
Professor Richard O'Kennedy [2018 – Present]

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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

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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 64th edition. After the restrictions on in person contacts over the last few years we, more than ever, appreciate the vital importance of meeting in person and connecting with others from around the word. You will, over the next 15 days, 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 terrific insights into science and the role which it plays for positive progress within society. Over the coming two weeks 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 over the coming two weeks.

Anne

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

The Prime Minister

2022 - PRESENT

10 DOWNING STREET
LONDON SW1A 2AA

I am exceptionally pleased to send my greetings to the students from all over the world attending the International Youth Science Forum in London.

The theme of the Forum this year is Science for Unity and in recent years we have seen the important contributions science can make to society. From researching and manufacturing vaccines in the UK and across the globe, to building our resilience against climate change, I recognise that science and the people behind it are at the core of how we can meet societal challenges and create a more prosperous, healthy and sustainable future.

In the UK we see science, and the innovations it makes possible, as key to our future wellbeing and prosperity. To achieve our ambitions, we need to ensure that all young people with the interest and talent have the opportunity to aspire to careers in science. As well as encouraging our own young people we also need to attract, develop, and retain talented young people, like yourselves, from around the world and offer them a research environment that nurtures and gets the best out of them.

I hope your experience over the two weeks of the Forum reinforces your ambitions to study science and perhaps inspires you to consider returning to the UK one day to build a successful research career.

Rishi Sunak
The Prime Minister

Welcome

It is with great pleasure that we welcome you to the 64th London International Youth Science Forum and we are thrilled to be able to welcome so many of you to this year's event.

The theme for this year's Forum is Science for Unity. 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 climate change. To deliver solutions which are equitable, affordable, inclusive and globally accessiblewe rely on 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, we 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 for the rest of your lives! Get involved and make the most of this life changing opportunity.

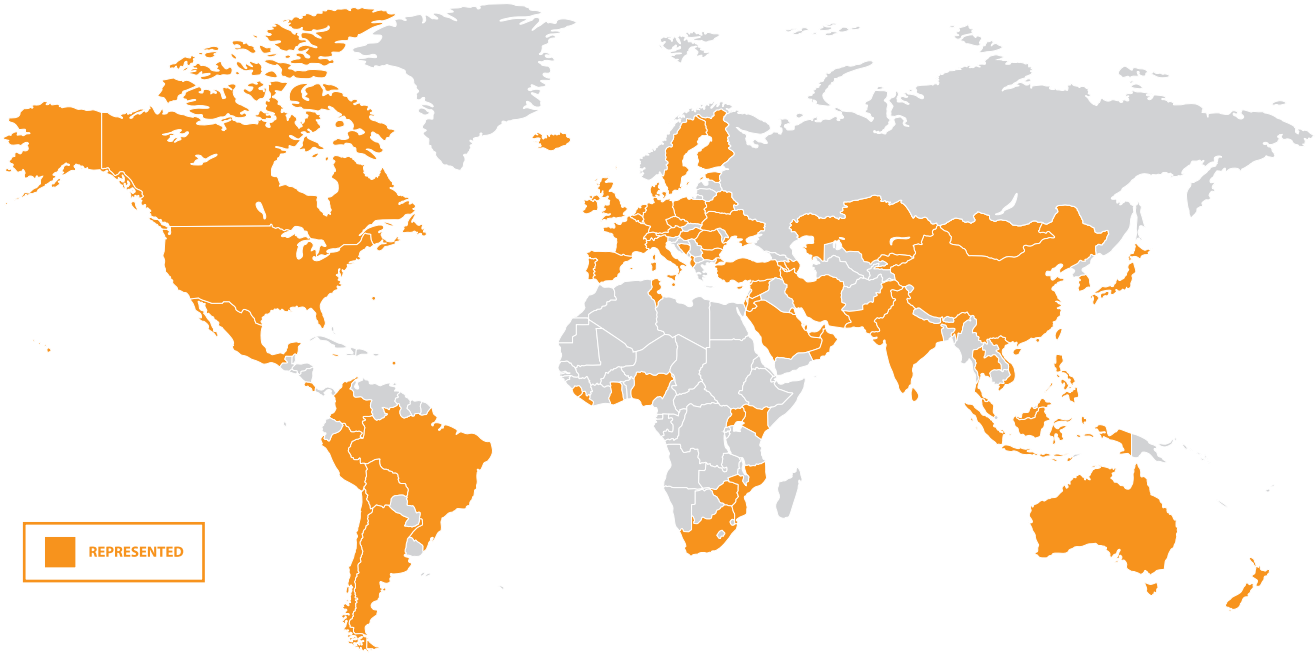
Everyone is welcome at LIYSF and we are thrilled to have you with us. You are now part of a special family of global scientists.

Let's change the world!

Professor Clare Elwell
President

Richard Myhill
Director

84 REPRESENTED COUNTRIES & TERRITORIES



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BULGARIA
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TURKEY
UGANDA
UKRAINE
UNITED ARAB EMIRATES
UNITED STATES
VIETNAM
WALES
ZIMBABWE

SCHEDULE OF EVENTS

	Morning	Afternoon	Evening
Wednesday 26th July		Arrivals	Welcome Talk & Introductions
Thursday 27th July	Opening Ceremony & Keynote Address – **Prof. Ben Feringa** & LIYSF President Welcome – **Prof. Clare Elwell**	Principal Lecture Demonstration – **Prof. Dame Sue Black**	LIYSF Grand Quiz
Friday 28th July	Visit to Research & Scientific Establishments in London	Principal Lecture Demonstration – **Prof. Dame Wendy Hall**	Great Crossword Treasure Hunt
Saturday 29th July	Principal Lecture Demonstration – **Prof. Waseem Qasim**	**The Science Forum Bazaar** – Student Project Poster Board Event	Optional Guided Coach Tour of London
Sunday 30th July	Optional Visit to Stonehenge	Optional Visit to Stonehenge	Debate Evening
Monday 31st July	Principal Lecture Demonstration – **Prof. Christopher Aiden-Lee Jackson**	Specialist Lectures	Student Topics & Science Communication
Tuesday 1st August	Day Visit to Research & Scientific Establishments	Day Visit to Research & Scientific Establishments	Principal Lecture Demonstration – **Prof. Perla Maiolino**
Wednesday 2nd August	Specialist Study Day led by **Prof. Clare Elwell**	Specialist Study Day	Optional Theatre Night
Thursday 3rd August	Day Visit to Oxford & Cambridge Research and Scientific Establishments	Day Visit to Oxford & Cambridge Research and Scientific Establishments	Rehearsals
Friday 4th August	Alumni Specialist Lectures	Principal Lecture Demonstration – **Prof. Hiranya Peiris** & Museums	**International Cabaret** – Cultural Showcase Performance Evening
Saturday 5th August	Principal Lecture Demonstration – **Prof. Sir Steven Cowley**	Principal Lecture Demonstration – **Prof. Sarah Gurr**	LIYSF Sports Day Session
Sunday 6th August	Optional Visits: Day Visit to Oxford, Cambridge or Tower of London	Optional Visits: Day Visit to Oxford, Cambridge or Tower of London	**Traditions of Home** – Sharing World Customs and Fashion Evening
Monday 7th August	Specialist Lectures	Optional Visits to Buckingham Palace and the London Eye	Optional Theatre Night
Tuesday 8th August	Closing Keynote Lecture – **Prof. Lee Cronin**	Participants' Forum & Closing	Farewell Party
Wednesday 9th August	Departures		

PRINCIPAL LECTURES AND DEMONSTRATIONS | **SPECIALIST LECTURES** | **SCIENTIFIC VISITS** | **SOCIAL PROGRAMME** | **OPTIONAL VISITS**

Keynote Address

THE JOY OF DISCOVERY

Professor Ben Feringa

University of Groningen, The Netherlands

Exploring across the current frontiers of chemical sciences there is vast uncharted territory to experience the joy of discovery. Far beyond Nature's design, the creative power of synthetic chemistry provides unlimited opportunities to realize our own molecular world as we experience every day with products ranging from drugs to displays that sustain modern society. In their practice of the art of building small, chemists have shown amazing success in the past decades. Moving from molecules to dynamic molecular systems the fundamental challenge is how to control and exploit motion at the nanoscale.

In this presentation the focus is on Professor Ben Feringa's journey in the world of molecular switches and motors, the process of discovery and personal experiences through his scientific career. In particular, Professor Ben Feringa will address how fundamental questions and molecular beauty have guided him on this journey.

Ben L. Feringa obtained his PhD degree at the University of Groningen in the Netherlands. After working as a research scientist at Shell in the Netherlands and the UK, he was appointed lecturer and in 1988 full professor at the University of Groningen and named the Jacobus H. van 't Hoff Distinguished Professor of Molecular Sciences in 2004. He is a member of the Royal Netherlands Academy of Sciences. In 2008 he was appointed Academy Professor and he was knighted by Her Majesty the Queen of the Netherlands. Feringa's research has been recognized with numerous awards including the 2016 Nobel Prize in Chemistry.

Principal Lectures & Demonstrations

27th July
Are your hands unique?

28th July
From AI to eternity

Professor Dame Sue Black

University of Oxford

There are two parts of our body that are usually on ready display to the world around us – our face and our hands. Most of us look to the face for recognition of individuals but in the world of forensic investigation, we realise just how important the hands are for identification. This presentation will discuss whether our hands might be unique to us.

Professor Dame Sue Black is the 37th President of St John's College, University of Oxford. She is one of the world's leading forensic scientists and has most recently been the Pro-Vice-Chancellor for Engagement at Lancaster University. Since graduating from the University of Aberdeen in human anatomy and forensic anthropology, Professor Black has had a varied and distinguished academic career, lecturing in Anatomy at St Thomas' Hospital London and working as a consultant in forensic anthropology for both the Home Office and Foreign and Commonwealth Office, undertaking forensic investigations in Iraq, Sierra Leone and Grenada. She was the lead forensic anthropologist during the international war crimes investigations in Kosovo. From 2003 to 2018 she was Professor of Anatomy and Forensic Anthropology at Dundee University.

Professor Black has written widely and has made regular media appearances, including on BBC Radio 4's Desert Island Discs and The Life Scientific. She was made a Dame Commander of the Order of the British Empire in the 2016 Queen's Birthday Honours for services to Higher Education and Forensic Science and in 2021 entered the House of Lords as a cross-bencher peer as Baroness Black of Strome. Professor Black is also the 65th President of the Royal Anthropological Institute and she is the lifetime Professor of Anatomy for the Royal Scottish Academy.

Professor Dame Wendy Hall

University of Southampton

Artificial Intelligence is set to transform society in the coming decades in ways that have long been predicted by science fiction writers but are only now becoming feasible. While AI is still a long way from being as powerful as the human brain, many machines can now outperform human beings, particularly when it comes to analysing large amounts of data. This will lead to many jobs being replaced by automated processes and machines. As with all major technological revolutions, such advancements bring with it unexpected opportunities and challenges for society with a need to consider the ethical, accountability and diversity impacts. In this talk Professor Hall will discuss trends in AI and their implications for society. She will lay out why we need to take a socio-technical approach to every aspect of the evolution of AI in society, to ensure that we all reap the benefits of AI and protect ourselves as much as possible from applications of AI that might be harmful. She will build on her experience of the development of the Web and the Internet to consider how the evolution of AI in this context could have a more profound impact on society than previous generations of AI development.

Dame Wendy Hall, DBE, FRS, FREng is Regius Professor of Computer Science, Associate Vice President (International Engagement) and is Executive Director of the Web Science Institute at the University of Southampton. She became a Dame Commander of the British Empire in the 2009 UK New Year's Honours list and is a Fellow of the Royal Society, the Royal Academy of Engineering and the ACM. Dame Wendy was co-Chair of the UK government's AI Review, which was published in October 2017 and a member of the AI Council. She is currently the co-Chair of the ACM Publications Board and Editor-in-Chief of Royal Society Open Science. She is also a member of the Digital And Computing Skills Education Task-force established by the Department of Education in 2023.

29th July

HOW TO TRAIN YOUR T-CELLS FOR A BATTLE-ROYALE

Professor Waseem Qasim

University College London

Our immune systems protect us from infections and provide constant surveillance to keep us healthy. T cells are a group of white blood cells that are key coordinators of immunity, which orchestrate, police and licence immune responses. They have an ability to persist life-long and provide important memory of previous encounters. It is now possible to genetically reprogram and transplant T cells to fight certain types of cancer, and they are amongst the first examples of approved 'living-cell' medicines. This lecture will journey through developments, from early gene-adding strategies, through to emerging platforms to re-write DNA code.

Waseem Qasim is a Paediatric Immunologist and Professor of Cell and Gene Therapy in London. He trained in Medicine in Newcastle and specialised in Paediatrics and transplantation in London. He is leading 'bench-to-bedside' development of translational gene therapies for children with blood and immune disorders, including trials of T cells engineered to express chimeric antigen receptors (CARs) against leukaemia. The group was one of the first to incorporate genome editing technology including CRISPR/Cas9 and base editing, leading to new treatments with 'universal' off-the-shelf T cells.

30th July

STUDENT DEBATE SESSION: THE IMPLICATIONS OF AI IN THE MODERN WORLD

Professor Richard O'Kennedy

Qatar Foundation, Qatar

This debate session will ask students to consider the implication of AI and medicine. This debate, led by Professor Richard O'Kennedy will also consider the future employment of new tools such as, ChatGPT and the ethical implications.

Richard O'Kennedy is Vice-President for Research at Hamad Bin Khalifa University, Qatar, Chair of the Board of Qatar Science and Technology Park and Member of the Royal Irish Academy. He is Science Patron of LIYSF. He has also been an LIYSF participant, staff member and President (2005-2017). He was Scientific Director of the Biomedical Diagnostics Institute, Head of the School of Biotechnology and Vice-President at Dublin City University, Ireland, and the Institute of Biology of Ireland. He has a H index of 60, ca 16,000 citations, has generated over 400 publications, three books and has supervised over 100 research students (including 72 Ph.Ds.). He directs the Applied Biochemistry Research Group, internationally recognised for its expertise in assay development and is a Founder of AbYBiotech. He is passionate about innovative approaches to Healthcare and has received many awards for teaching, research and innovation.

31st July

THE GEOLOGICAL RECORD OF CLIMATE CHANGE

Professor Christopher Jackson

Jacobs Engineering Group

The Earth is warming, with present and future changes in our climate being of global concern. However, it is important to understand that since its formation of approximately 4.6 billion years ago, the Earth's climate has varied between periods when ice sheets extended down to very low-altitudes at low-latitudes, to times when water at the Equator was as the same temperature as bath water. Occurring before humans inhibited the Earth, these often dramatic and rapid changes in climate were driven by a range of natural processes, controlling the habitability of our planet and its associated biodiversity. This talk will look at the geological record of climate change, how these changes impacted life on Earth, and how this can help in understanding present and future climate.

Chris Jackson is Director of Sustainable Geoscience at the engineering consultancy group, Jacobs and Visiting Professor of Basin Analysis at Imperial College London. Chris works in the general area of sedimentary basin analysis. When not studying rocks, Chris gives geoscience lectures to the public and in schools, having appeared on several, earth science focused, television productions and podcasts. Chris is engaged in efforts to improve equality, diversity, and inclusivity in Higher Education. Professor Jackson also presented the 2020 Royal Institution Christmas Lecture, the first black scientist to do so in 182 years.

1st August

ROBOTS WITH SENSE OF TOUCH AND SOFT BODIES

Professor Perla Maiolino

University of Oxford

Robots operating in dynamic and unstructured environments must exhibit advanced forms of interaction with objects and humans. "Sense of Touch" in robots can play a fundamental role in enhancing perceptual, cognitive and operative capabilities of robots, specifically when they physically interact with objects and humans in the environment. Many solutions to design, engineer and manufacture tactile sensors have been presented for both rigid and soft robots, because the availability of appropriate sensing technologies is the first and necessary step, but the effective utilization of "sense of touch" in robots depends also on the understanding of the tactile perception mechanism and in particular how the interaction between the body and the environment filters the tactile information to simplify the following inference process. This lecture will present technological and research challenges for providing robots (rigid and soft) with sense of touch.

Perla Maiolino is Associate Professor at Engineering Science Department and member of Oxford Robotic Institute at the University of Oxford, where she is establishing the ORI Soft Robotics lab. She received her Ph.D. in Robotics, her Meng in Robotics and Automation and BEng in Software Engineering from University of Genova (Italy) and she was postdoctoral researcher at University of Cambridge at the BIRL lab. Her research focused on new technological solutions for the development of an artificial skin for providing robots with the "sense of touch". The artificial skin technology (CySkin) which has been objective of her research, has been integrated in several robotics platforms and was part of the exhibition "Robots" which has been shown at Science Museum of London in 2017.

4th August
THE UNIVERSE A DETECTIVE STORY

Professor Hiranya Peiris

University College London

Modern fundamental physics contains ideas just as revolutionary as those of Copernicus or Newton; ideas that may radically change our understanding of the world; ideas such as extra dimensions of space, or the possible existence of other Universes. Testing these concepts requires enormous energies, far higher than what is achievable by the Large Hadron Collider at CERN, and in fact, beyond any conceivable Earth-bound experiments. However, at the Big Bang, the Universe itself performed the ultimate experiment and left clues and evidence about what was behind the origin of the cosmos as we know it, and how it is evolving. And the biggest clue is the afterglow of the Big Bang itself. In the past decade we have been able to answer age-old questions accurately, such as how old the Universe is, what it contains, and its destiny.

Hiranya Peiris is Professor of Astrophysics at University College London and co-Director of the UCL Cosmoparticle Initiative. She is also Professor of Cosmoparticle Physics at Stockholm University. She completed her undergraduate studies at Cambridge University in 1998 and got her PhD from Princeton University in 2003. She was a Hubble Fellow at the University of Chicago in 2004-2007 and then moved back to Cambridge as a Halliday Fellow of the Science & Technology Facilities Council. She began a faculty position at University College London in 2009. In 2016 she was elected fellow of the American Physical Society and vice president of the Royal Astronomical Society. She has won many prestigious prizes including; the Institute of Physics (IOP) Fred Hoyle Medal, the Göran Gustafsson Prize in Physics of the Royal Swedish Academy of Sciences, the Max Born Prize of the German Physical Society and the IOP, the Eddington Medal of the Royal Astronomical Society, the Gruber Cosmology Prize and the Breakthrough Prize in Fundamental Physics. She was elected a member of the Royal Swedish Academy of Sciences in 2022.

5th August
GETTING TO A FUSION POWER PLANT – ARE WE READY?

Professor Sir Steven Cowley

Princeton Plasma Physics Laboratory, USA

Just over one hundred years ago, Arthur Stanley Eddington conjectured that stars are powered by fusion reactions and speculated that one day humans would generate power by fusion. Not yet. However, private capital is flooding into fusion research driven by the lure of fusion's promise of sustainable "firm" power and optimism about new technologies. Optimism is indeed high with the recent successful ignition of a laser fusion pellet in California and record fusion energy from JET (the Joint European Torus). In this lecture, Professor Sir Steven Cowley will talk about the science and prospects to accelerate fusion development and design and build the first fusion pilot plants.

Steven Cowley, a theoretical physicist and international authority on fusion energy, became the seventh Director of the Princeton Plasma Physics Laboratory in 2018, and a Princeton professor of astrophysical sciences. He has held positions on both sides of the Atlantic including: President of Corpus Christi College and professor of physics at the University of Oxford and, chief executive officer of the United Kingdom Atomic Energy Authority (UKAEA). He was made a Knight Batchelor in the Queen's Birthday Honours, 2018. He has won the Glazebrook Medal of the Institute of Physics and the Physics Department Award for Excellence in Teaching, UCLA. He is an Honorary Fellow at the Institute of Engineering and Technology. He is a Fellow at; the Royal Academy of Engineering, the Royal Society, the Institute of Physics, UK and the American Physical Society.

Keynote Closing Lecture

5th August
Global Food Security: Food, Famine and Fungi

Professor Sarah Gurr

Exeter University

There are three themes to this lecture. Firstly, Professor Sarah Gurr will (briefly) look at why her fascination for plants and fungi allowed her to carve a career as a "plant doctor". Secondly, she will look at fungi and their role as "citizens of modern society", that is for their age, huge diversity, for their tasks in manufacturing and in biotechnology, as recyclers but also for their impact on global food insecurity. Finally, she will outline some of the recent work in her laboratory that looks at modelling the movement of fungal foes in the face of climate change. She shall finish with some thoughts on the tasks needed to mitigate the impact of crop disease and to ensure global food security.

Sarah Gurr graduated from Imperial College of Science Technology and Medicine with an Honours degree and a PhD and was awarded the Huxley medal for excellence. She worked as a post-doctoral fellow at St Andrews University and was awarded a Royal Society University Research Fellowship. She became lecturer, Reader and then Professor at Oxford and Fellow of Somerville College. She then moved her research team to Exeter University. She has published widely, been awarded a plethora of prizes and honorary positions.

8th August
Alien-Chemputation

Professor Lee Cronin

University of Glasgow

In this lecture, Professor Lee Cronin will explain how a search for the origin of life has led to the construction of a new technology to search for aliens and build new drugs and chemicals. The process of chemputation has emerged due to the need to generate ways of doing complex algorithmic processes to search chemical space – this search is driven by the need to discover new drugs, new materials, as well as complex chemical systems. Success will not only help us cure disease but also answer one of the oldest and most important questions of humanity – are we alone in the universe?

Leroy (Lee) Cronin is the Regius Professor of Chemistry in Glasgow. Since the age of 9 Lee has wanted to explore chemistry using electronics to control matter. His research spans many disciplines and has four main aims: the construction of an artificial life form; the digitization of chemistry; the use of artificial intelligence in chemistry including the construction of 'wet' chemical computers; the exploration of complexity and information in chemistry. His recent work on the digitization of chemistry has resulted in a new programming paradigm for matter and organic synthesis and discovery – chemputation – which uses the worlds first domain specific and universal programming language for chemistry – XDL, see XDL-standard.com. His team designs and builds all their own robots from the ground up and the team currently has 25 different robotic systems operating across four domains: Organic synthesis; Energy materials discovery; Nanomaterials discovery; Formulation discovery. All the systems use XDL and are easily programmable for both manufacture and discovery. His group is organised and assembled transparently around ideas, avoids hierarchy, and aims to mentor researchers using a problem-based approach. Nothing is impossible until it is tried.

Specialist Lectures - 31st July

31.1 Engineering human tissues—science fiction or reality?

Akinola Akinbote

EMBL Barcelona, Spain

If you have (or haven't) heard of 3D printing, stem cells, and organ-on-chips, then this lecture on the Sci-Fi-like field of tissue engineering is for you. Tissue engineering (aka regenerative medicine) holds the promise to repair and/or replace damaged organs by attempting to create functional human tissues. Generating functional tissues outside the human body involves replicating the complex interplay of cells, biomolecules, and scaffolds—as well as the physical and mechanical forces that in vivo tissues experience—in the lab. In this introductory lecture, we will discuss the basic building blocks of tissue engineering with real-life examples of early-stage ideas and commercially available tissue-engineered products. There will be a focus on microfluidic devices in tissue engineering. We will then wrap up with an interactive session, in teams, to discuss preassigned case studies.

Akinola Akinbote is a PhD Candidate at EMBL Barcelona, Spain, and Heidelberg University, Germany, specializing in regenerative medicine and tissue engineering. His research, in the Haase lab at EMBL, focuses on harnessing human-induced pluripotent stem cells and microfluidics to develop perfusable 3D cardiac-specific vascularised tissues, mimicking heart vessels-on-chip. With a degree in Polymer Engineering from Case Western Reserve University, USA—focusing on biomaterials and biomedicine—he gained experience in the medical devices industry and was a visiting researcher at MIT. Akinola is also dedicated to enhancing equity in scientific education by promoting underrepresented voices in STEM. Through his involvement in training and advocacy, he seeks to create a more inclusive scientific community.

31.2 Introduction to natural language processing and its applications

Dr Noura Al Moubayed

Durham University

This lecture will introduce the fundamental concepts of Artificial Intelligence and Natural Language Processing. Those form the basic blocks for building large language models that can summarise text, answer questions, translate between languages, among many other tasks. We will learn about the concept of transformer models, how they are designed and how they encode text in order to learn how to perform different tasks. Given the wide range of applications of language models and their impact on our daily life, it is very important to understand the ethical implications of their usage. We will explore their limitations, the biases they might introduce, and how to mitigate those risks.

Dr Al Moubayed is an Associate Professor at the department of computer science at Durham University, and Head of Applied Machine Learning and AI at Evergreen Life. Her main research interest is in Explainable Machine Learning, Natural Language Processing, and Optimisation. Her research projects focus on applying machine learning and deep learning solutions in the areas of healthcare, social signal processing, cyber-security, and Brain-Computer Interfaces. All of which involve high dimensional, noisy and imbalance data challenges. Dr Al Moubayed is an Associate Editor for IEEE Transactions on Emerging Topics in Computational Intelligence and N8 CIR Machine Learning team lead for Durham. She leads multiple projects in collaboration with different industrial partners with a team of over 15 researchers. Her research received several medial coverages (e.g. BBC, ITV, Time Magazine, and Wired Magazine) and she was ranked amongst the top 20 women in AI in the UK by RE•WORK 2019.

31.3 THE SCIENCE OF AGING

Professor Cláudia Cavadas

University of Coimbra, Portugal

The knowledge generated by Professor Cláudia Cavadas' laboratory has been contributing to the hypothesis that ageing and age-related disorders could be controlled through neuroendocrine strategies. These strategies involve targeting a key brain area involved in the neuroendocrine system - the hypothalamus - along with its primary functions such as regulating circadian rhythm, sleep, or food intake. Additionally, her research explores the intricate interplay between the brain, as the hypothalamus and peripheral organs. Professor Cláudia will present the scientific questions, methodologies, and results from her laboratory: How is aging investigated in the lab? How do aged cells differ from young cells? If cellular aging is delayed, can age-related diseases like neurodegenerative diseases also be delayed? How does it work? Is there a specific brain area relevant to delaying aging? How do unhealthy eating or sleeping habits accelerate aging? Is it possible to develop a therapy for progeria, a rare genetic disease in which children age rapidly? Ultimately, how is science contributing to the development of a recipe for the elixir of youth for everyone?

Cláudia Cavadas has a PharmD and PhD in Pharmacology. She is Associate Professor (Fac. Pharmacy) and coordinates the research group - Neuroendocrinology and Aging Group, Center for Neuroscience and Cell Biology, University of Coimbra. Her research has been focusing on how ageing and age-related disorders could be controlled through neuroendocrine strategies. Professor Cavadas is former Vice-Rector – University of Coimbra, in charge of Research, and Director of the Institute of Interdisciplinary Research. Professor Cavadas has more than 100 publications and supervised around 40 graduate students.

31.4 MATHEMATICS & EQUALITY: FROM SPECIFICATION TO SIMULATION

Dr. Howard Haughton

King's College London

This lecture delves into the pivotal role of mathematics in promoting equality, diversity, and inclusivity across various domains. First, we explore how set theory and predicate calculus provide rigorous tools for specifying and analysing equality measures in diverse settings. Next, we examine how the synergy between mathematics, statistics, and computer science enables us to simulate the impact of inclusivity within organisations, fostering equitable outcomes. Lastly, we discuss how mathematics can be harnessed to define and verify fairness and equality properties in AI and machine learning applications.

Dr. Haughton is an expert in quantitative financial risk with a focus on computational finance at King's College London. With a PhD in Mathematical Computer Science, he has held senior positions in risk and capital markets across prominent institutions, including JP Morgan Chase, Deutsche Bank, Merrill Lynch, and Dresdner Bank AG. Dr. Haughton's career also involved roles as Chief Risk Officer and co-Head of Treasury at a Building Society, where he developed treasury management policies and led the Treasury department. He has provided advisory services and research on sustainable development, leadership, corporate governance, diversity, and inclusion. Additionally, Dr. Haughton is an accomplished author and holds advanced degrees and professional qualifications in various finance-related fields. He actively contributes to capacity building and delivers training on risk management and quantitative modelling for institutions and regulators.

31.5 ROVER AND OVER AGAIN

Abigail Hutty

ispace Europe SA, Luxembourg

Space Rovers have been used to explore the moon and other planets for decades. Abbie has worked on four different Rover missions, two for Mars and two for the moon. Some parts look very similar between the final designs of these and other space rover missions, but other areas of the designs are totally different. Why? In this session we will explore the design drivers for these missions, such as concept of operations, traverse distance, operational life, signal delay, thermal environment, terrain type, materials restrictions, planetary protection and so on, and how they impact the optimal rover design.

Abbie Hutty is Chief Engineer at ispace Europe SA, where she leads the development of Lunar Rover missions. Prior to this role, she spent 12 years at Airbus space in the UK, working primarily on Mars Rover missions; first as Lead Structures Engineer and then as Systems Engineer and Delivery Manager on ExoMars – Europe's first Rover mission to Mars, and then as a Principal Systems Engineer and Subsystem Manager on the NASA-ESA collaboration for the Mars Sample Return mission, the Sample Fetch Rover.
Abbie is a chartered engineer, holding a Masters Degree in Mechanical Engineering from the University of Surrey.

31.6 ENCAPSULATED BIOMATERIAL: A VISUAL SENSOR TECHNOLOGY

Professor Ibrahim Katampe

Central State University, Ohio, USA

Advances in materials science and engineering have paved the way for the development of new and more capable sensors. Various types of visual chemical and biological sensor technologies being looked at for depend for the most part on conventional analytical chromatographic and spectroscopic methodologies. These methods are particularly unsuitable for use in the field, because they are generally complex and employ instruments and equipment which are expensive and susceptible to damage from transport and possible contamination in the field. The need for simple, rapid, and inexpensive field methods for detecting "contaminants" is the basis of the proposed lecture to develop the ability to detect, identify, and often quantify biological or chemical agents. My education research project seeks to develop innovative Microencapsulated bioactive chemical delivery systems (CDS) as sensors that can detect and visually indicate (on-demand) biological and chemical activity.

Dr. Katampe is a Nigerian-born research scientist, entrepreneur, and an innovator with about nine United States Patents registered under his name. Professor Katampe is an advocate for STEM and is a recipient of several awards including the prestigious Planet Africa Science and Technology Award by the planet Africa Group, Canada: the SOIN award for Technology Innovation by the Montgomery County, two-time recipient of NASA Faculty Research Fellowship, a member of the Center for the Advancement of STEM Leaders (CASL) just to mention a few.

31.7 WHY SCIENTISTS SHOULD ALSO BE REVOLUTIONARIES

Professor David Nutt

Imperial College London

In this lecture, David Nutt will explore examples from history and his own present day research why scientific advances often require challenging irrational and un-scientific rules and regulations. However to do this requires courage and resilience and the support of colleagues, but can make a real difference in the way science progresses.

David Nutt is currently the Edmond J. Safra Professor of Neuropsychopharmacology and director of the Neuropsychopharmacology Unit in the Division of Brain Sciences. He trained at Cambridge, Guys Hospital, Oxford University and NIH in the USA. His research focuses on how drugs work in the brain and the mechanisms underpinning psychiatric disorders particularly addiction and depression. He has published over 700 research papers, 36 books and 8 government reports. He founded the charity Drug Science in 2009 and won the John Maddox prize for standing up for science in 2013. David is currently Chair of DrugScience (formally the Independent Scientific Committee on Drugs (ISCD) and President of the European Brain Council. Previously he has been President of the European College of Neuropsychopharmacology (ECNP), the British Neuroscience Association (BNA) and the British Association of Psychopharmacology (BAP). He is a Fellow of the Royal Colleges of Physicians and of Psychiatrists and a Fellow of the Academy of Medical Sciences. He is the UK Director of the European Certificate and Masters in Affective Disorders Courses and a member of the International Centre for Science in Drug Policy. In 2010 The Times Eureka science magazine included him in the 100 most important figures in British Science, and the only psychiatrist.

31.8 HOW DO VIRUSES OVERCOME OUR FRONTLINE IMMUNE DEFENCES?

Dr Lucy Thorne

Imperial College London

Every cell in our body has a built-in surveillance and defence system that protects us against infection every day. To establish an infection, all viruses have to overcome or sneak past these frontline defences. Viruses that jump from other species into humans, such as Ebola, HIV, and SARS-CoV-2, are especially good at overcoming defences in their new hosts to cause outbreaks. In this lecture, we'll uncover the battle between viruses and our frontline defences and the tricks used by successful viruses. We'll then focus in to ask whether this could have helped SARS-CoV-2 to become pandemic? We'll investigate why SARS-CoV-2 variants arose during the pandemic and why they were able to overcome our frontline immune defences and vaccines to transmit even more effectively, causing new waves of infection. We'll discuss the big question of what might happen next for SARS-CoV-2, and what can we learn from this to prepare for future pandemics?

Dr Lucy Thorne studied Biochemistry at the University of Oxford, specialising in viruses and the immune system as part of her Masters year, with a research placement at Princeton University. She pursued her interest in infectious disease through a PhD at Imperial College London, where she studied how viruses hijack the cell's machinery to replicate. She moved to the University of Cambridge to continue this research and established a research project in Uganda to study viruses circulating in children. In 2015, she contributed to the Ebola virus outbreak responses in Sierra Leone. She then joined UCL to investigate how viruses overcome our immune defences, firstly studying HIV and most recently SARS-CoV-2. She is now continuing this research as a new lecturer and research group leader at Imperial College London.

Specialist Study Day - 2nd August

2.1 Nanotechnology for Medicine

Professor Khuloud Al-Jamal

King's College London

Nanotechnology is a largely growing field with applications in engineering, energy, and medicine. Applications of nanotechnology in medicine, referred to as nanomedicine, attracts a lot of attention as it offers advantages such as, improving drug therapy outcomes, reducing side effects and facilitating early detection of diseases. Recently, new classes of drug therapeutics such as peptides, proteins and nucleic acids have emerged that are promising, they do carry challenges in delivery. Sophisticated methods of delivery which allow protection of these molecules from degradation and facilitate entry into the target cells are therefore required. Nanocarriers, containers which are 10,000 smaller than human hair, can be made of several materials such as lipid, carbon, metal or polymer.

Khuloud Al-Jamal is Chair of Drug Delivery & Nanomedicine and Head of Medicines Developments at the Institute of Pharmaceutical Science, King's College London. She completed her PhD at the Centre for Drug Delivery Research and postdoctoral training at the Nanomedicine Lab, The School of Pharmacy, University of London. She undertook her pre-registration training at University College London Hospitals. She published over 150 research articles with H-index 50. Named one of the World's Top 2% researchers (2022) according to Stanford University analysis. She is a recipient of the Royal Pharmaceutical Society of Great Britain Science Medal, Maplethorpe Fellowship for the promotion of pharmaceutical education and excellence in research, BBSRC New Investigator Award, the Controlled Release Society Nanomedicine and Nanoscale Delivery Focus Group Young Investigator Award. She is a three-time winner of the Wellcome Trust Science Image Awards. She is an editorial board member for several journals such as Journal of Controlled Release, Biomaterials Science, Scientific Reports, MedBioMed and Journal of Drug Targeting.

2.2 Design for Mars

Professor Lucy Berthoud

University of Bristol

In this lecture, Professor Lucy Berthoud will be focussing on designing for Mars exploration. She has led research looking at radiation levels on Mars, design of Martian airlocks and has been advisor to a building a Martian House project in Bristol. In her industry work she has worked on European Mars Sample Return projects to design a facility to house Martian samples on Earth. She has also worked on a double walled isolator with robotic manipulator to handle Martian samples. In the past she worked on the European Space Agency's Mars Express satellite mission. She has done a TEDx talk entitled: 'Is there Life on Mars?

Professor Berthoud has worked for 25 years in Spacecraft research and in industry. She has a Master's in Mechanical Engineering from the University of Bristol, UK and a PhD in Space Physics from Sup'Aero/ONERA in Toulouse, France. She has worked at the European Space Agency, NASA Johnson Space Centre and BAe Space Systems (now Airbus Defence and Space). Lucy teaches Space Systems, Advanced Space Systems, Systems Engineering design and has research interests in Mars habitats, microsatellites, interplanetary spacecraft design, Mars sample return missions, planetary protection, active debris removal, Model-Based Systems Engineering. She works for a spacecraft manufacturer: Thales Alenia Space, part time.

2.3 QUANTUM SCIENCE, TECHNOLOGIES AND QUANTUM COMPUTERS

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.

2.4 SHEDDING LIGHT ON THE HUMAN BRAIN

Professor Clare Elwell

University College London

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

Clare was inspired to study Medical Physics by a lecture she attended at LIYSF and is now a Professor of Medical Physics at University College London and Vice Dean for Impact for UCL Engineering. She obtained a BSc and MPhil in Physics with Medical Physics at Exeter University, and a Ph.D in Medical Physics at UCL. She develops functional near infrared spectroscopy (fNIRS) to image the human brain and her research projects include studies of autism, brain injury, migraine and malaria. She currently leads the Brain Imaging for Global Health (BRIGHT) project. She has won awards for her teaching, research and public engagement activities and has contributed to numerous science festivals, schools events and media broadcasts.

2.5 QUARKS, LEPTONS, BOSON: PHYSICS WITH CERN'S LARGE HADRON COLLIDER

Professor Victoria Martin

University of Edinburgh

The Large Hadron Collider (LHC) at CERN is the world's largest machine and has been operating for over a decade. Experiments at the LHC have discovered a new subatomic particle - the Higgs boson - explored the difference between matter and anti-matter and made precise measurements of the fundamental particles that make up our Universe. The LHC will run for the next 15 years and should continue to improve physicists' understanding of physics at the smallest accessible scales. In this lecture, Professor Victoria Martin will introduce scientists' current understanding of particle physics, the Large Hadron Collider and explain how physicists from all over the world work together in unity to understand the fundamental physics of the Universe.

Victoria is Professor of Particle Physics at the University of Edinburgh and a collaborator at the ATLAS experiment at the Large Hadron Collider at CERN. Victoria Martin grew up in Kilmarnock, Scotland, where her great physics teachers inspired her to study physics at university. At university in Edinburgh, she learned about particle physics - how the building blocks of the Universe work together to form everything around us - and she decided to become a particle physics researcher. Victoria has collaborated with physicists from all over the world on experiments at CERN in Geneva and Fermilab near Chicago.

2.6 GENE EDITING AND GENE THERAPY FOR IMMUNE DISEASES

Professor Emma Morris

University College London

This lecture will consider how genetic mutations can cause serious diseases affecting the immune system and how new genetic engineering technologies can be used to correct these mutations. We will consider examples of how these are used to treat patients.

Professor Morris is a doctor and a scientist. She is Professor of Clinical Cell & Gene Therapy at University College London. In the hospital she looks after patients undergoing stem cell transplants and having gene therapy treatments for inherited diseases of the immune system and various forms of cancer. Her research group is developing new methods to use gene editing to treat diseases.

2.7 A CHEMICAL'S JOURNEY: ODYSSEY INTO SEVERAL UNEXPECTED PLACES

Dr Edmond Sanganyado

Northumbria University

This lecture delves into the adventurous travelogue of a fictional character, Col. Fire Retardant. Once a formidable firefighter, Col. Fire Retardant bravely battled flames in homes, airports, and industrial settings, safeguarding life, and property. But now, Col. Fire retardant is stuck in an unexpected place - the skin of a bottlenose dolphin in the depths of the ocean. How did this happen? Importantly, is Col. Fire Retardant not harming the dolphin? This lecture uncovers the intriguing journey of synthetic chemicals, from their beneficial use in our lives to their unintended environmental impact, highlighting the critical role of chemistry in understanding, and addressing these complex challenges.

Dr Edmond Sanganyado is a Zimbabwean environmental chemistry and toxicology researcher, science policy advocate and the President of Zimbabwe Young Academy of Sciences. He is an assistant professor at Northumbria University. He is renowned for developing chromatographic techniques to understand the environmental behavior of pollutants in aquatic ecosystems.

2.8 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 this talk, Dr Jane Usher will introduce some of the 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, Dr Jane Usher 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 Professor 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 postdoc 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.

Alumni Specialist Lectures - 4th August

4.1 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.

4.2 JUICE, The Mission to Jupiter's Icy Moons

Professor Michele Dougherty

Imperial College London

JUICE - JUpiter ICy moons Explorer - launched in April 2023. It will spend at least three years making detailed observations of the giant gaseous planet Jupiter and three of its largest moons, Ganymede, Callisto and Europa. Iconic missions to the outer solar system like Voyager 1 and 2, Galileo, and Cassini gave us a close look at the giant planets' largest moons. Once thought of as inactive, cold conglomerates of ice and rock, we know that these distant moons are planet-like worlds with rich histories. While our search for life in the universe was once restricted to Earth-like planets, with terrestrial atmospheres and surface oceans, such icy moons with potentially habitable underground oceans offer new horizons. Jupiter's three largest icy moons — Europa, Ganymede and Callisto — all show hints of hosting liquid water oceans beneath their crusts. On Earth, life thrives in the deepest, darkest parts of our oceans near hydrothermal vents. Could life similarly evolve or survive in the oceans floors of these moons? The European Space Agency's (ESA) boldest mission to date aims to find out.

Professor Dougherty is head of the Physics Department and a Royal Society Research Professor at Imperial College London. She was principal investigator for the Cassini spacecraft magnetic field measurements throughout Cassini spacecraft operations around Saturn and its neighbourhood. Amongst a series of remarkable results, she was, in particular, responsible for the discovery of geysers from an ocean below the surface of the Saturn moon Enceladus due to their electromagnetic signature. The discovery changed our entire perspective on the Saturn system and even where life might evolve in the solar system. She received the Royal Society's Hughes Medal in 2008 and was awarded a Royal Society Research Professorship in 2014.

4.3 THE WORLD WITHIN YOUR GUT: HOW IT SHAPES YOU, AND HOW WE SHAPE IT

Émer Hickey - LIYSF 2014

University of Exeter

Within the human gastrointestinal tract exists a complex ecosystem estimated to total 1014 different microorganisms. This community of microbes (the microbiota) shape their host in many ways – like training the immune system, protecting against pathogens and even influencing human behaviour and disease! This lecture will explore the many ways in which the intestinal microbiota influences humans and how we, in return, can reshape this community through dietary interventions to best benefit host health.

Émer is the current Chief of Staff at LIYSF. When not at the Forum, she is a final year PhD researcher at the MRC Centre for Medical Mycology at the University of Exeter. Her work focuses on fungi that live in the gut, and the impact dietary supplementation has on these microbes. Émer has been actively involved in microbiology research since winning the BT Young Scientist and Technology Exhibition in Ireland in 2013. Her team went on to take first place at both EUCYS and The Google Science Fair. These days, Émer is still actively involved in encouraging young people to pursue science, speaking at numerous outreach events. Émer wrote a collection of science experiments for primary school children entitled 'Fungi are alive!' and was awarded the NUI Prize for Medical Mycology in 2021. Émer first attended LIYSF in 2014 and has been returning as a staff member ever since.

4.4 THE PAST, PRESENT AND FUTURE TREATMENT OF CANCER

Dr Stephen Maher - LIYSF 1997

Trinity College Dublin

Many of us will experience cancer in our lifetime, be it family, friends, colleagues or indeed ourselves. This lecture will provide participants with an insight into the history of cancer and it's treatment, from the ancient Egyptians through to medieval surgeons, and how events like world war II and people like the Pierre and Marie Curie shaped the course of cancer treatment. We will explore how and why cancer develops, how we manage and treat cancer today, and what the future of cancer treatment looks like.

Stephen Maher is an Associate Professor in translational oncology at Trinity College Dublin and St. James's Hospital where he teaches medicine and has a cancer research group. He has an undergraduate degree in analytical science and a PhD in oncology. He has mentored number postdoctoral scientists and PhD students and has published extensively in the field of poor prognosis cancers and resistance to chemotherapy and radiation. His current research interests include studying the molecular mechanisms controlling cancer cell sensitivity to treatment and genetic reprogramming to increase treatment responses, as well as molecular stratification of pre-cancerous lesions for cancer risk stratification of patients. Stephen was a participant at the LIYSF in 1997 and considers it a defining moment in his career.

4.5 EYES IN-SIGHT: THE IMPACT OF SCIENCE IN AN EYE HOSPITAL SETTING

Helen Peregrine - LIYSF 2009

East Sussex Healthcare NHS Trust

In the last decade, scientific breakthroughs have given us new interventions to prevent blindness, but what happens when you apply this science to a busy hospital setting? How do we balance saving someone's vision whilst still caring for the whole population? Are there still more breakthroughs to come? This lecture will give an insight into the latest developments of how we can save patients' eyesight, working on the frontline of eye care in a hospital setting, and some of the challenges to overcome. It also has a look at lessons Helen Peregrine has learned along the way, from sitting in the audience at LIYSF to becoming hands on in hospital work.

Helen Peregrine BSc (Hons) MCOptom DipTP(IP) Prof Cert Glauc. Helen is the Head of Optometry at East Sussex Healthcare NHS Trust, leading a team in areas of ophthalmology including laser, eye casualty, AMD, injections, cornea and glaucoma. She attended LIYSF in 2009 after being awarded for a research project at St. Thomas' Hospital. She returned in 2010 as Counsellor and 2011 as Chief of Counsellors. She studied Optometry and Vision Sciences at Cardiff University then trained in hospital work at Oxford Eye Hospital, followed by qualifications in ophthalmology at East Sussex Hospitals. Outside of work she has run charity eye projects in Moldova and loves living by the sea.

4.6 EXPLORING GEOMETRY, TOPOLOGY, AND HIGHER DIMENSIONS

Dr Hannah Price - LIYSF 2005

University of Birmingham

How many ways can we spin around in four spatial dimensions? How far do we need to travel on a Möbius strip to return to the start? In this talk, we will discuss how abstract theoretical questions like these are important in modern physics. Starting from an introduction to the concept of dimensions, we will explore various ideas from the intertwined mathematical fields of geometry and topology. We will then delve into the realm of physics to discover how such concepts play a role in real phenomena. Finally, we will discuss how experimental advances are helping us to artificially simulate particles in exotic geometries and higher spatial dimensions, bringing exciting ideas from theoretical physics into the laboratory.

Dr Hannah Price is a Reader in Theoretical Physics and a Royal Society University Research Fellow at the University of Birmingham. She received her PhD in 2013 from the University of Cambridge, before moving to Italy as a postdoctoral researcher and then a Marie Sklodowska-Curie fellow at the Pitaevskii BEC Center at the University of Trento. In 2017, she started her group in Birmingham, focusing on topological physics and synthetic dimensions. In 2018, she was awarded the IOP James Clerk Maxwell Medal and Prize for her early-career contributions to theoretical physics.

4.7 AERODYNAMICS, TURBULENT FLOW AND COMPUTATIONAL FLUID DYNAMICS

Dr Stephan Priebe - LIYSF 2000

General Electric, USA

Aerodynamics - the study of the motion of air around objects - is relevant in a broad range of applications, including aircraft and jet engines. In this talk, Dr Stephan Priebe will introduce basic aerodynamic principles with a focus on those that enable flight, from the fundamental question of why an aircraft flies to explaining aerodynamic features found in modern aircraft and jet engines. More advanced topics such as turbulence and computational fluid dynamics (CFD) will also be introduced. Most flows encountered in nature and engineering applications are turbulent, rather than laminar. Turbulent flows are characterized by seemingly-random fluctuations in contrast to orderly, laminar flow. Turbulence is an active area of research and an introduction to this fascinating topic in be provided. Dr Stephan Priebe also discuss how the flow of air or another fluid around an object can be simulated using computers including powerful supercomputers. This is known as Computational Fluid Dynamics, or CFD, and it plays an important role in understanding aerodynamic performance and in aerodynamic design.

Dr Stephan Priebe main interests are in turbulent flows and computational fluid dynamics. He is a Senior Engineer at the General Electric Research Center in Niskayuna, New York, where he works on applications such as turbines and jet engines. Stephan studied aeronautical engineering at Imperial College in London, followed by a PhD in Mechanical and Aerospace Engineering at Princeton University. He attended LIYSF as a participant in 2000 and returned as a member of the student staff in the following years, including as Chief of Staff in 2004.

4.8 MACHINE LEARNING FOR REAL-TIME MUSIC TRANSCRIPTION

Tim Romberg - LIYSF 1990

Skoove, Germany

One important feature of Skoove is its ability to detect the user's piano playing though a phone's or tablet's microphone. This talk will give some background on the complex nature of the sound of a piano, how this is linked to desirable qualities of the sound, and why the problem of transcribing, i.e. recognizing the played notes has been occupying researchers for several decades. We will then cover an example of an older approach as well as recent neural-network-based approaches to this problem. We will look at some of the practicalities of training such a network, and integrating it on a mobile device for real-time feedback. Finally, Tim Romberg will share some insights on what working on practical machine learning problems in a startup is like and how it might differ from working in fundamental research.

Tim is Chief Technology Officer at Skoove, an interactive app to teach piano, built in Berlin. He has a diploma in management engineering from the University of Karlsruhe (Germany). Prior to joining Skoove in 2018, he was working as team leader, IT consultant, backend and frontend developer at eBay, port management group PSA International and others. He has been living between Berlin and Brussels in recent years. He participated in LIYSF in 1990.

Specialist Lectures - 7th August

7.1 Sustainability & Energy

Dr Rocio Diaz-Chavez

Imperial College London

The Sustainable Development Goal 7 "Ensure access to affordable, reliable, sustainable and modern energy for all" also considers the actions needed to meet the Paris Agreement on Climate Change. The implementation of energy projects requires an assessment of its impacts, both negative and positive. Assessment of the co-benefits of energy projects focuses on their social and economic issues though the project's life cycle, which also requires the involvement of stakeholders and the wider public. Project designers and implementers must keep an open dialogue with stakeholders and the public. This lecture will discuss some examples on stakeholders' integration and benefits of energy projects.

Dr Rocio A Diaz-Chavez has a BSc in Biology/Ecology in Mexico and holds a PhD on Sustainable Development Indicators from the University of Wales Aberystwyth in the UK. She is a Senior Research Fellow at the Centre for Environmental Policy of Imperial College London. She acted as Deputy Director and Energy and Climate Change Programme Leader at the Stockholm Environment Institute Africa Centre from 2017 to 2022. Her research interests are on sustainability assessment and deployment of bioeconomy, bioenergy, land use and natural resources, socio-economic assessment and governance, climate change impacts, transport and agriculture. She has worked in Europe, Africa, Asia and Latin America. She developed indicators for the Global Bioenergy Partnership from FAO. She acted as Chair of the Social Group of the Bioenergy Standard for ISO. She was the co-chair of the International Energy Agency for the UK Task 40 (Biomass trading) 2012-2017. She received the SCOPE 2010 Young Scientist Award in Environmental Management for her work on indicators and standards.

7.2 Enabling Equity of Genomic Medicine in Global Populations

Dr Segun Fatumo

London School of Hygiene & Tropical Medicine

Since the first human genome was sequenced approximately twenty years ago, developments in genome technologies have resulted in the sequencing of millions of human genomes. However, genetic research is mostly focused on European heritage populations. For example, as of June 2021, the vast majority of genomics investigations, including genome-wide association studies (GWAS), have been undertaken in people of European heritage (86.3%), followed by East Asian (5.9%), and African (1.1%). As a result, many underrepresented populations may miss out on the potential benefits of genetic research, such as improved disease aetiology, early detection and diagnosis, rational drug design, and enhanced clinical care. In this lecture, Dr Segun Fatumo will talk about the value of genomic diversity for genetic discovery and polygenic risk prediction, as well as the importance of including all populations in genomic studies for precision medicine.

Dr. Segun Fatumo is a computational geneticist with a specialty in Non-Communicable Diseases (NCD) Genomics in African Populations. He is the head of NCD Genomics at MRC/UVRI and LSHTM Uganda Research Unit as well as an Associate Professor at London School of Hygiene and Tropical Medicine (LSHTM) UK. Segun Fatumo specialises in genome-wide association studies (GWAS), Polygenic Risk Score Analysis (PRS) and Mendelian Randomisation (MR).

7.3 UNVEILING THE UNIVERSE: EXPLORING THE MYSTERIES OF DARK MATTER & ENERGY

Dr Tassia Ferreira

University of Oxford

As light travels through the universe from distant galaxies and stars, it gets bent and distorted by massive objects such as galaxy clusters. This captivating phenomenon, known as gravitational lensing, enables us to explore and investigate the distribution of matter throughout the vast expanse of the universe, and have thus emerged as indispensable tools for studying the universe and unraveling the mysteries of dark matter and dark energy. In this talk, Dr. Tassia Ferreira will begin by introducing gravitational lensing, providing insights into its historical development and fundamental mechanisms. She will discuss the various types of lensing, including strong, weak, and microlensing, and explore their distinct characteristics and observational signatures. Lastly, she will focus on the dark components of the universe, highlighting their mysteries, our current understanding of them, and how cosmologists employ gravitational lensing to study them.

Dr. Tassia Ferreira did her early studies in Physics, in Salvador, Brazil, before moving on to a PhD in cosmology, where she spent a year abroad in the US. She is currently a Newton International Fellow at the University of Oxford, where she works in observational cosmology. Dr. Tassia Ferreira is also deeply involved in the upcoming Vera Rubin Observatory's Legacy Survey of Space and Time, which will provide an unprecedented view of the universe.

7.4 ENERGY STORAGE AND FUTURE ELECTRICITY

Professor Martin Foster

University of Sheffield

The discovery and harnessing of electricity has revolutionised humanity. Just over a hundred years ago mechanical methods of generating electricity were invented and this led to lightbulbs replacing gas lamps and electric motors replacing steam engines as the prime movers for industry. Wired and then wireless communications followed. In the 1950s the transistor was invented paving the way towards micro, and then nano, electronics, computing and the manipulation of electricity using solid-state devices. Since the start of the millennium government's throughout the world have supported renewable energy and the transition to electric powered transport heading towards the goal of Net Zero. This talk describes the roles of energy storage can, and, will play in future electricity.

Martin Foster is Professor of Energy Storage and Conversion in the Department of Electronic and Electrical Engineering at the University of Sheffield. Over the last decade he has been involved in several government sponsored projects on energy storage including helping to establish a grid-connected battery energy storage research platform, investigating the use of rail track side energy storage for energy buffering and more recently the FEVER project which aims to develop and demonstrate a fully grid independent, cost-effective, and socially acceptable, renewables powered electric vehicle charger.

7.5 REACHING NET-ZERO USING ROCKS

Professor Robert Hoye

University of Oxford

Achieving net-zero CO2eq emissions is arguably the greatest challenge of the generation. Rocks are typically thought of for their mechanical properties, or for structural applications. This talk explores how an emerging generation of rocks can be used for clean energy conversion devices that can produce the green electricity and fuels that will power our transition to net-zero. There is particular focus on emerging materials capable of energy harvesting to power trillions of smart devices, and can be used to create artificial leaves to produce hydrogen and fuels sustainably. The underlying principles behind the key enabling properties of these materials are discussed, and how efficient materials for these devices can be designed.

Professor Robert Hoye is an Associate Professor of Inorganic Chemistry at the University of Oxford, where he is a Fellow of St. John's College. He completed his PhD at the University of Cambridge (2012-2014), followed by a postdoctoral position at MIT (2015-2016), before returning to Cambridge for Research Fellowships at Magdalene College (2016-2019) and Downing College (2019-2020). He moved to Imperial College London as a Lecturer in 2020, and was subsequently made Senior Lecturer in 2022. He moved to Oxford in Oct. 2022. Hoye is also a Research Fellow of the Royal Academy of Engineering (RAEng), and was awarded the Young Engineer of the Year prize by the RAEng in 2018.

7.6 THE MATHEMATICS OF WOUND HEALING

Professor Tanniemola B. Liverpool

University of Bristol

In this lecture, Professor Tanniemola B. Liverpool will discuss some 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. The wound repair 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. Professor Tanniemola will describe some recent work on studying wound healing in two-dimensional epithelial tissues of a fruit fly pupal wing. 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. It will also describe 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 B. Liverpool has been in the Applied Mathematics Institute of the School of Mathematics at Bristol for the last 16 years. He got his 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. Professor Tanniemola 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.

7.7 SHOULD AI BE ABLE TO READ YOUR BEHAVIOURS AND EMOTIONS?

Dr Temitayo Olugbade

University of Sussex

Everyday human interaction (with oneself, objects or the environment, and other people or animals) is rich with emotion-related experiences and expressions. There are many instances across life where AI that is able to recognise or interpret these expressions can be used to provide more natural interaction with digital technology or more tailored support to improve human functioning. How is AI given such capability? What ethical issues arise with it? Are virtual agents and robots themselves able to display behaviours associated with emotional experience?

Temitayo Olugbade is a Lecturer in Computer Science and AI at University of Sussex. She is also a Honorary Fellow at University College London. She holds a PhD in Affective Computing, MSc in Intelligent Systems, and BSc in Computer Engineering. Her research interests are in the development and application of AI methods to real world affect recognition contexts.

7.8 EMERGING INFECTIONS

Dr Padmasayee Papineni

London North West University

Plague, Ebola, HIV, measles, dengue, chikungunya, COVID-19, m-pox. This lecture will consider the interactions between the triad of infectious agents, their hosts, and the environment that have led to the infectious diseases epidemics and pandemics that threaten human existence through history to modern times.

Dr Padmasayee Papineni is a Consultant in Infectious Diseases and Acute Medicine at London North West University Healthcare NHS Trust, UK. She has a B.Sc. in International Health from University College London, a Diploma in Clinical Tropical Medicine from Universidad Peruana Cayetano Heredia, Peru and a Diploma in HIV Medicine. From 2014-2017 she was the project leader for a multi-centre clinical trial in tuberculosis based at National University Singapore. She lecture on the Asian Diploma in Tropical Medicine at Nagasaki University, Japan and is the winner of the Lancet's Wakley Prize essay 2022.

FRIDAY 28TH JULY

28.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.

28.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.

28.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.

28.D Health Services Laboratory

Health Services Laboratories provide pathology services to both the NHS and private healthcare, combing 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.

28.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.

28.F Imperial College London, Department of Chemical Engineering

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

28.G Imperial College London, Department of Civil and Environmental Engineering

This world leading department focuses on interactions between the built environment and the natural world and recognise that civil and environmental engineering are crucial to meeting the major challenges faced by society.

28.H Imperial College London, Department of Materials: Biomaterials in Regenerative Medicine

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

28.I 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.

28.J 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.

28.K Linnean Society

The Linnean Society of London is the world's oldest active biological society. The Society takes its name from the Swedish naturalist Carl Linnaeus (1707–1778) whose botanical, zoological and library collections have been in its keeping since 1829. These unique collections are of continuing fundamental importance as a primary reference for taxonomy.

LONDON SCIENTIFIC VISITS

28.L 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.

28.M 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.

28.N 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.

28.O 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.

28.P 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.

TUESDAY 1ST AUGUST

1.A Airbus UK

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

1.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.

1.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.

1.D 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.

1.E Cardiff University - School of Pharmacy and Pharmaceutical Sciences & Brain Research Imaging Centre (CUBRIC)

Cardiff University Brain Research Imaging Centre (CUBRIC) is set to become one of Europe's top facilities for brain imaging. The new facility brings together world-leading expertise in brain mapping with the very latest in brain imaging and brain stimulation. The centre plays a pivotal role in the global endeavour to better understand the causes of neurological and psychiatric conditions, so as to yield vital clues for the development of better treatments.

1.F 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.

1.G 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.

1.H 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.

1.I University of Kent, Chemistry and Forensic Science

World renwownded facilities at the Chemisty 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.

NATIONAL SCIENTIFIC VISITS

1.J Laing O'Rourke

HS2 is Britain's new high speed rail line being built from London to the North-West, with HS2 trains linking the biggest cities in Britain. HS2 is the largest infrastructure project in Europe and the most important economic and social regeneration project in decades. Laing O'Rourke's and its specialist business Expanded is underway with the construction of the main station box at HS2's Old Oak Common in West London. Laing O'Rourke is an international engineering and construction company delivering state-of-the-art infrastructure and buildings projects for clients. It is the largest privately owned construction company in the UK.

1.K National Space Academy

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

1.L Rolls Royce

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

1.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 3RD AUGUST

3.A Babraham Institute

The Babraham Institute is a world-class research institution, situated at the heart of the Babraham Research Campus, near Cambridge. Our mission is to be an international leader in research focusing on basic cell and molecular biology with an emphasis on healthy ageing through the human lifecycle.

3.B University of Cambridge. NIHR Cambridge Biomedical Research Centre and Cambridge Science Centre

A partnership between Cambridge University Hospitals Foundation Trust and the University of Cambridge. The partnership between the hospital and the University creates an environment where internationally outstanding biomedical and clinical scientists work alongside clinical practitioners to achieve translation of research for the benefit of patients. The Cambridge Cancer Centre is a dynamic collaboration of researchers, clinicians, and the pharmaceutical and biotech industries based in the Cambridge area. We combine world-class science and technology with excellent patient care to pioneer new ways to prevent, detect and treat cancer.

3.C University of Cambridge, MRC Laboratory of Molecular Biology

The MRC Laboratory of Molecular Biology (LMB) is one of the world's leading research institutes. Discoveries and inventions developed at the LMB, for example DNA sequencing and methods to determine the structure of proteins, have revolutionised all areas of biology. Its scientists work to advance understanding of biological processes at the levels of atoms, molecules, cells and organisms. This information will help us to understand the workings of complex systems, such as the immune system and the brain, and solve key problems in human health.

3.D 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.

3.E UK Atomic Energy Authority, Culham Science Centre

The Culham Science Centre 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.

3.F 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.

OXFORD & CAMBRIDGE SCIENTIFIC VISITS

3.G Oxford Botanic Garden and Arboretum, Univerity of Oxford

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.

3.H Oxford Health Biomedical Research Centre

Improving brain health: the future in mind. The centre is run in partnership with the University of Oxford and involves 11 additional partner university and NHS Trusts across England

3.I 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.

3.J 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.

3.K University of Oxford, NIHR Oxford Biomedical Research Centre, The Jenner Institute

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

PROGRAMME VENUES

Beitside Halls of Residence
Hall Host: Yousif Almazmi

Beit Halls

Southside / Eastside Halls

Queen's Halls of Residence
Hall Host: Noga Arad

Metrogate House

Astor Hyde Park

Tara Halls of Residence
Hall Host: Natalija Vujacic

Copthorne Tara Hotel

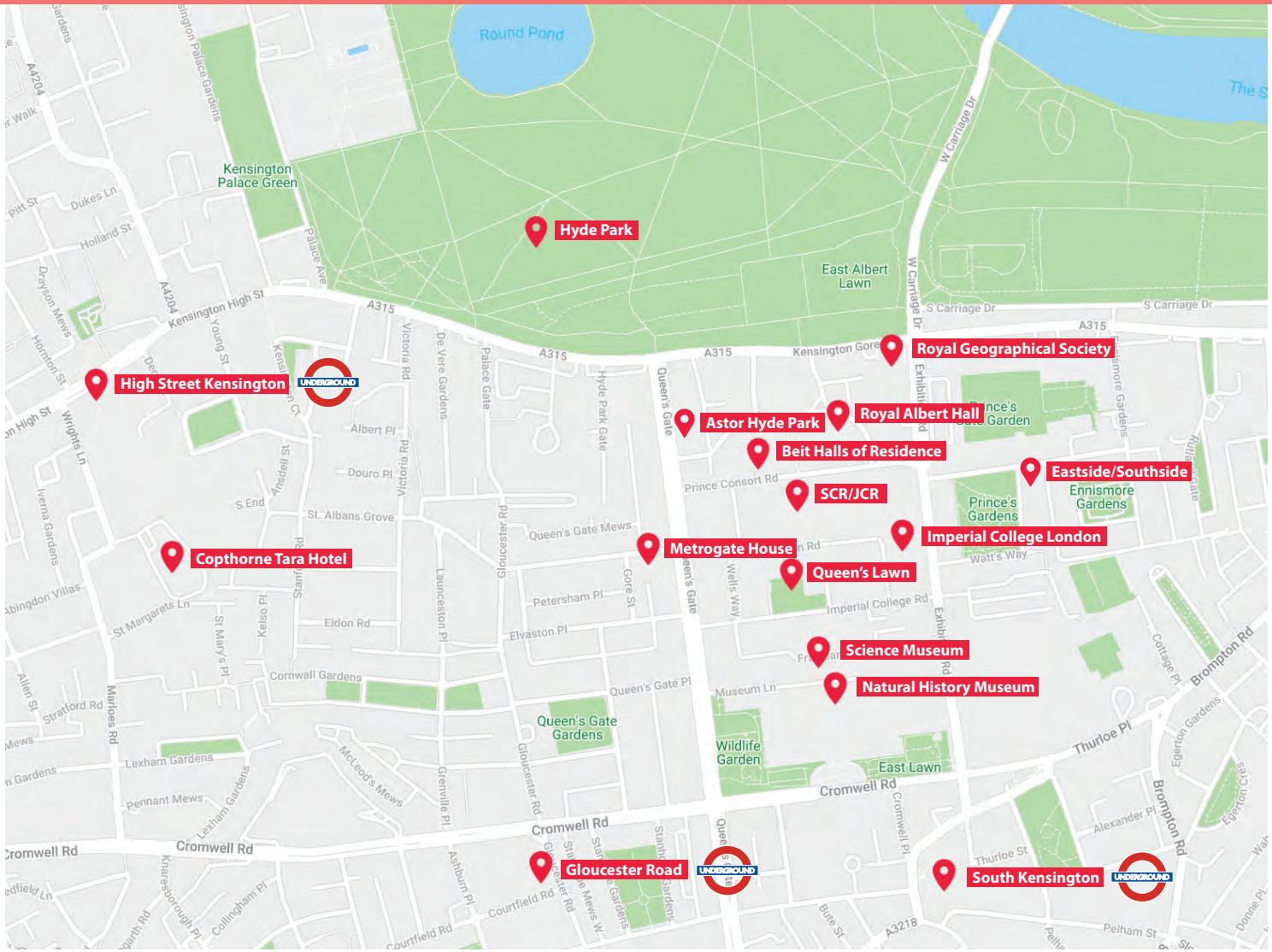
Programme Venues

Imperial College London

Royal Geographical Society

Copthorne Tara Hotel

LIYSF CAMPUS



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YOSA
YOUNG SCIENTISTS FOR AFRICA

ASDAN China

EngineeringUK

National Youth Science Forum

unesco
United Kingdom National Commission for UNESCO

AcrossAtlantic

Milset
MILSET EXPO-SCIENCES INTERNATIONAL

Fondation Jeunes Scientifiques Luxembourg

Youth Science Canada
Sciences jeunesse Canada

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South Africa

Siddhant Gupta
SEO Manager
India

Jeetendra Kumar
Developer
India

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Hall Host
UAE

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Academic Liaison
UK

Bianca Ascheieri
Deputy Host
Italy

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Germany

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SUPPORTING ORGANISATIONS

LIYSF is very proud to have the support across the globe of: National Government Offices, British Council Offices, National and International Science Competitions, Science Organisations, 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	***UK, Nigeria***
Akademeia Foundation	***Poland***
ASDAN	***China***
ASTRA DK	***Denmark***
British Council School Madrid	***Spain***
British School of Brussels	***Belgium***
Brookhouse International School	***Kenya***
Campion College	***Jamaica***
Cathedral and John Connon School	***India***
Celia and Glyn Allen	***Guernsey***
China Association for Science and Technology	***China***
Club Ciencias	***Chile***
Dublin City University	***Ireland***
Engineering UK	***UK***
English School	***Cyprus***
Federazione delle Associazioni Scientifiche e Tecniche	***Italy***
Foundation Jeunes Scientifiques Luxembourg	***Luxembourg***
University of Fraser Valley	***Canada***
Fundació Catalunya-La Pedrera	***Spain***
GC School of Careers	***Cyprus***
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John Roan School	***England***
Memorial University of Newfoundland	***Canada***
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MOHERI	***Oman***
National Youth Science Forum	***Australia***
OKSEF / BUCA	***Turkey***
Polish Children's Fund	***Poland***
The Qatar Foundation	***Qatar***
RED Science & Technolody Youth Activities Network	***Mexico***
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Research Council of Norway	***Norway***
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Stiftung Jugend Forscht	***Germany***
Swedish Federation of Young Scientists	***Sweden***
Swiss Youth in Science	***Switzerland***
Technologie & Innovation	***Austria***
Tomos Morgan Scholarship, Anglesey County Council	***Wales***
The Senior School	***Cyprus***
Young Scientists for Africa	***UK, Africa***
Youth Science Canada	***Canada***

ACKNOWLEDGEMENTS

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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, Steve Martin, Ruta Matijosa, Claire McNulty, Glennis Myhill, Paul Myhill, David Nugent, Ailsa Sayers, Emmanuel Shofoluwe & Manuel Tapia.

The Royal Geographical Society and Imperial College London for hosting our programme sessions. Imperial College, Metrogate House, Astor Hyde Park for providing accomodation and the Copthorne Tara Hotel for providing accommodation, meals and hosting our social programme.

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The next edition of LIYSF:

65th London International Youth Science Forum

24th July – 7th August 2024

LIYSF

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