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# **A celebration of physics**

On a road to a sustainable world

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The Institute of Physics (IOP) Awards recognise and reward excellence in people and teams who have made outstanding and exceptional contributions to the discipline of physics.

They reflect the breadth of work in the physics community across academia, industry, education and outreach.

Previous winners constitute a roll call of those who have shaped physics in the 21st century. It is our aim to identify and honour physicists who are making remarkable contributions today, and to encourage younger members of the community to achieve even greater successes in the future.



## Welcome to the 2024 Awards

On behalf of the Institute of Physics, I want to congratulate all of the 2023 IOP Award winners. Each one has made a significant and positive impact in their profession, whether as a researcher, teacher, industrialist, technician or apprentice and I hope they are incredibly proud of their achievements.

There is so much focus today on the opportunities generated by a career in physics and the potential our science has to transform our society and economy and I hope the stories of our winners will help to inspire future generations of scientists.

**Professor Sir Keith Burnett CBE FRS CPhys FInstP FLSW  
IOP President**

# Bronze Early Career Medals

The Bronze Early Career Medals and Prizes are awarded for exceptional early career contributions to physics.

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## James Clerk Maxwell Medal and Prize

### Dr Nikolas Breuckmann MInstP

University of Bristol

For outstanding contributions to the quantum error correction field, particularly work on proving the no low-energy trivial state conjecture, a famous open problem in quantum information theory.

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## Jocelyn Bell Burnell Medal and Prize

### Raquel Lopez-Rios De Castro MInstP

King's College London

For exceptional contributions to improving the inclusivity and diversity within postgraduate research programmes in the UK while developing multidisciplinary techniques for the design of next-generation anti-cancer therapeutics.

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## Clifford Paterson Medal and Prize

### Dr Alasdair Price MInstP and Dr Euan Allen MInstP

Siloton Limited

For developing and commercialising a world-leading integrated photonics platform for optical coherence tomography, and designing a personal eye scanner around it to prevent sight loss from age-related macular degeneration.

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## Henry Moseley Medal and Prize

### Dr Hannah Stern MInstP

University of Cambridge

For outstanding contributions to the understanding of electronic processes in molecular semiconductors and two-dimensional materials, including identification of a spin qubit in a two-dimensional material.

## Mary Somerville Medal and Prize

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### Dr Nicole Yunger Halpern

National Institute of Standards and Technology

For vivifying Victorian physics in the public imagination by casting (quantum) thermodynamics as steampunk in writing and art, breaking barriers between disciplines.



# Silver Subject Career Medals

The Silver Subject Medals and Prizes are awarded for distinguished contributions to physics.

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## Thomas Young Medal and Prize

### **Professor David Andrews CPhys FInstP and Professor Ventsislav Valev FInstP**

University of East Anglia and University of Bath

For the discovery of chirality-sensitive optical harmonic scattering, first predicted theoretically in 1979 and demonstrated experimentally 40 years later.

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## James Clerk Maxwell Medal and Prize

### **Professor Themis Bowcock FInstP**

University of Liverpool

For outstanding contributions to the design, construction and operation of major detector and computing systems that have underpinned quark and lepton-flavour measurements worldwide.

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## Lise Meitner Medal and Prize

### **Dr Harry Cliff FInstP**

University of Cambridge

For outstanding contributions to the public understanding of physics, through exhibitions, festivals, talks, magazine articles and a popular science book, which together have reached millions of people.

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## Dennis Gabor Medal and Prize

### **Dr Ramsey Faragher CPhys FInstP**

Royal Institute of Navigation

For numerous innovations in signal processing and sensor fusion, including the invention and commercialisation of the Supercorrelation™ technique that greatly increases the accuracy, sensitivity and security of global navigation satellite system receivers.

### Cecelia Payne-Gaposchkin Medal and Prize

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#### **Professor Louise Harra CPhys FInstP**

PMOD/WRC and ETH Zürich

For pioneering contributions to the development of extreme ultraviolet imaging and spectroscopy instrumentation for solar space missions and its application to further our understanding of dynamic activity on the Sun.

### James Joule Medal and Prize

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#### **Professor Jan-Theodoor Janssen CEng CPhys FInstP**

City, University of London

For outstanding contributions to fundamental and practical quantum electrical metrology.

### Ernest Rutherford Medal and Prize

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#### **Professor David Jenkins FInstP**

University of York

For outstanding contributions to experimental nuclear physics and commitment to widening participation.

### Rosalind Franklin Medal and Prize

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#### **Professor Clemens Kaminski CEng FInstP**

University of Cambridge

For the development of optical methods to interrogate molecular mechanisms in biological systems.

### David Tabor Medal and Prize

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#### **Professor Lev Kantorovich FInstP**

King's College London

For new theories of molecular diffusion and kinetics of two-dimensional assembly of molecules on surfaces, and origins of atomistic resolution in atomic force microscopy imaging, energy dissipation and molecular manipulation.

### Sam Edwards Medal and Prize

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#### **Professor Ulrich Keyser FInstP**

University of Cambridge

For pioneering the study of transport of structured nucleic-acid molecules through nanopores and the quantification of out-of-equilibrium polymer dynamics at the single-molecule level.

### Nevill Mott Medal and Prize

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#### **Professor Ji-Seon Kim FInstP**

Imperial College London

For outstanding contributions to the materials physics of molecular semiconductor devices, including the pioneering integration of spectroscopy and simulation to elucidate the key processes determining device performance.

### John William Strutt, Lord Rayleigh Medal and Prize

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#### **Professor Nikolaos Mavromatos FInstP**

King's College London and National Technical University of Athens

For fundamental contributions to theoretical physics, especially the suggestion of quantum gravity-induced modifications of the vacuum optical properties, a proposition that led to a new arena of theoretical and experimental investigation.

## Fred Hoyle Medal and Prize

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### **Professor Carole Mundell Hon.FInstP**

The European Space Agency

For the groundbreaking discovery of the critical role of magnetic fields in black-hole driven explosions and for pioneering novel astrophysical polarimetry of gamma ray bursts to probe the dynamic universe.

## Joseph Thomson Medal and Prize

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### **Professor Ulrich Schneider FInstP**

University of Cambridge

For groundbreaking experiments on the collective dynamics of quantum gases in optical lattices, including fundamental studies of localisation effects in both disordered and quasicrystalline systems.

## Peter Mansfield Medal and Prize

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### **Professor Emeritus Borivoj Vojnovic FInstP**

University of Oxford

For pioneering and sustained contributions to the field of cancer research, through development of novel sensing, imaging and ionising radiation technologies applied to basic translational and medical research.



# Gold Medals

The Gold Medals and Prizes are awarded for outstanding and sustained contributions to physics by a person of international reputation.

## Michael Faraday Medal and Prize

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### Room Temperature MASER Team

(Professor Neil Alford MBE FEng CPhys FInstP, Professor Mark Oxborrow MInstP, Professor Chris Kay FInstP, Dr Jonathan Breeze FInstP, Dr Juna Sathian MInstP and Dr Enrico Salvadori MInstP)

For their discovery of the world's first room-temperature solid-state organic maser and subsequent discovery of room-temperature continuous wave masing in diamond.

## William Thomson, Lord Kelvin Medal and Prize

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### The Schools' Observatory

(Dr Jennifer Claydon, Dr Stacey Habergham-Mawson MInstP, Alison Keen, Dr Vicki Last, Dr Christopher Leigh, Professor Andrew Newsam MInstP and Dr Emma Smith)

For an outstanding contribution to inspiring young people and teachers to succeed in their STEM journey, making the Universe accessible to everyone, empowering people to know more and do more.

## Lawrence Bragg Medal and Prize

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### Professor Sally Jordan FInstP

The Open University

For work in advancing pedagogy, understanding demographic differences in attainment and in developing tools to allow computer assessment of free-text answers, which are in use across the world.

## Paul Dirac Medal and Prize

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### Professor Gavin P Salam FRS FInstP

University of Oxford

For profound, wide-ranging and impactful contributions to particle physics, especially those concerning the identification and structure of hadronic jets.



### **Katharine Burr Blodgett Medal and Prize**

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#### **Professor Kenneth TV Grattan OBE FREng CPhys FInstP and Professor Tong Sun OBE FREng FInstP**

City, University of London

For developing unique, patented, field-evaluated and now implemented photonics-based solutions for real-time monitoring of, for example, the pantograph-overhead line interface in electrified trains.

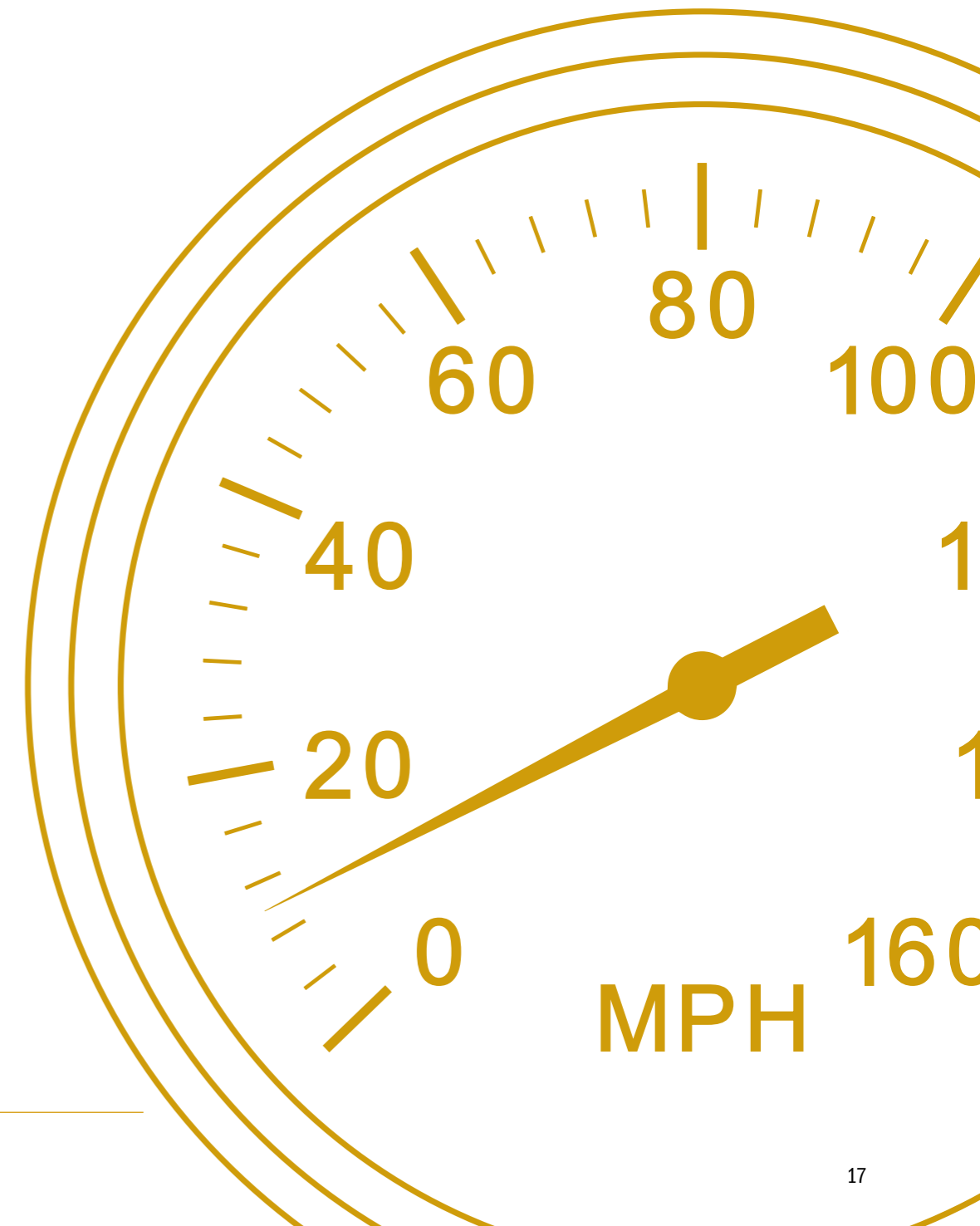
### **Richard Glazebrook Medal and Prize**

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#### **Professor Belinda Wilkes FInstP**

University of Bristol

For outstanding leadership as Director of the Chandra X-ray Center, supporting the operation, exploitation and public relations of NASA's premier X-ray observatory, and significant contributions to our understanding of quasars.



# Apprenticeship Employer Awards

The Apprentice and Apprenticeship Employer Awards celebrate the contributions that apprentices make to physics, and recognise employers that demonstrate their commitment and contribution to scientific and engineering apprenticeship schemes.

# The Lee-Lucas Award for Start-Up Enterprises

The Lee Lucas Award recognises and celebrates very early stage companies taking innovative products into the medical and healthcare sector.

## Apprenticeship Employer Award

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### British Airways

For creating a market-leading aeronautical engineering apprenticeship, building a lasting talent pipeline of future aircraft engineers and providing the student community with skills for life.

## Lee-Lucas Award

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### ArtioSense

For the development of novel, microfluidics-based force sensing technology that is being used to develop an intraoperative surgical aid for precision orthopaedic surgery.

# Business Start-Up Awards

The Business Start-up Award recognises and celebrates young companies with a great business idea founded on a physics invention, with great business growth potential and/or the potential of significant societal impact.

## Business Start-Up Awards

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### **Dyneval**

For developing an innovative analyser for precise measurement of semen quality pen-side to improve the efficiency of livestock production while reducing methane emissions.

### **Nebu~Flow**

For exceptional efforts in commercialisation of scientific research into a product, transforming respiratory drug delivery.

### **Occuity**

For the development of groundbreaking medical diagnostic instruments that enable fast, pain-free and non-contact screening and monitoring of ophthalmic and chronic diseases using the eye as a window to health.

### **Siloton**

For the development of a personal optical coherence tomography system, capable of reducing sight loss caused by age-related macular degeneration.

### **turboTEM**

For the development of a range of cost-effective modular and retrofittable upgrades to expand the performance, flexibility or usable service life of electron microscopes.

# Business Innovation Awards

The Business Innovation Award recognises and celebrates small, medium and large companies that have excelled in innovation, delivering significant economic and/or societal impact through the application of physics.

## Business Innovation Awards

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### **Coherent Scotland**

For the development of a range of cost-effective, turnkey, ultrafast lasers for life sciences, nanomanufacture and inspection applications.

### **Focal Point Positioning**

For pioneering and commercialising the methods and techniques needed to enable synthetic aperture processing on low-cost consumer devices such as smartphones and smartwatches.

### **Keit Industrial Analytics**

For the development and application of a novel Fourier transform spectroscopy and its application in revolutionising the monitoring and control of production processes.

# Teachers of Physics

## Teachers of Physics

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### **Dr Panos Athanasopoulos MInstP**

Prestatyn High School

For teaching excellence and an inclusive approach, outstanding support of colleagues, work with trainee teachers and contributions to the broader community at conferences and in online forums.

### **Mr Jed Marshall MInstP**

Alexandra Park School

For outstanding creativity and innovation in the classroom, extraordinary range of staff development locally and nationally, and work with pupils at an international level.

### **Ms Khushali Kanjee Mills MInstP**

Our Lady's Grammar School

For highly enthusiastic and skilled teaching raising the profile of physics in the school, committed and thorough development of colleagues, and outstanding work with pupils through extracurricular activities.

### **Mrs Amelia Ross MInstP**

St Bernadette Catholic Secondary School

For providing passion and enthusiasm for the subject, teaching excellence, inclusive teaching and outstanding leadership of professional development within the school and local area.

### **Mr Christopher Rossi MInstP**

St Joseph's College

For exceptional knowledge and classroom practice, development of pupils, and support of colleagues, trainee teachers, technicians and staff in the local community of schools and nationally through examination work.

**Mr Tom Squires MInstP**

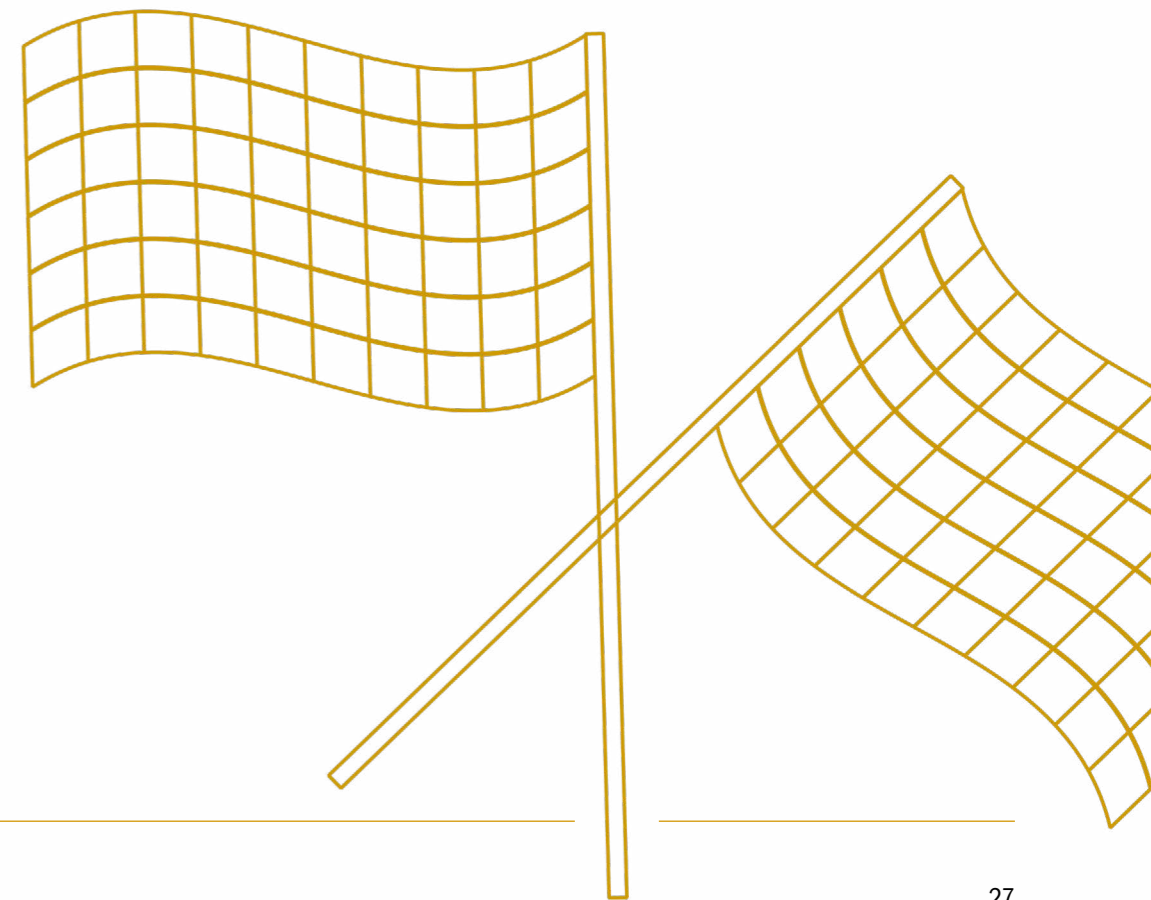
Hillcrest School and Sixth Form Centre

For inspirational and inclusive teaching and outstanding work with underrepresented groups, support for colleagues, and development of numerous links across the educational community.

**Mr Wayne Tabernor MInstP**

Alder Community High School

For supportive and inclusive teaching, work with underrepresented groups, curriculum development, and outstanding work with the wider educational community.



# Technician Award

The Technician Award enables the community to recognise and celebrate the skills and experience of technicians and their contribution to physics. With the aim of raising the professional status of technicians, the IOP Technician Award highlights the diverse role of technicians in education, research and industry.

## Technician Award

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### **Dr Jason Anderson MInstP**

Durham University

For outstanding contributions to modernising taught laboratories in line with contemporary research practices, and enabling delivery of remote and hybrid practical sessions during the Covid-19 pandemic.

### **Mrs Razika Berboucha MInstP**

Lampton Academy

For connecting students with real-world science and immersing them in the art of being true scientists.

### **Dr Steve Collins MInstP and Mr Richard J Webb MInstP**

University of Sheffield

For their outstanding technical expertise and support to students and staff as part of the undergraduate physics laboratory at the University of

### **Mr William Luckhurst MInstP**

King's College London

For outstanding technical support and leadership in the development of research infrastructure in King's College London, enabling generations of researchers to reach their potential across a range of disciplines.

### **Mr Andrés Tretiakov MInstP**

St Paul's School

For a passion and commitment to science education that has inspired young people, teachers and parents through school, outreach programmes, science festivals and social media.

# Honorary Fellowships

## Honorary Fellowships

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### **Professor Alan Miller CPhys Hon.FInstP**

Heriot-Watt University

For outstanding research in photonics and leadership in introducing successful new initiatives that support early career researchers across all disciplines.

### **Professor Carole Mundell Hon.FInstP**

The European Space Agency

For outstanding contributions to astrophysics research and strategic science policy, and taking a leading role in championing diversity and women in STEM.

### **Dr Mark Richards Hon.FInstP**

Imperial College London

For inspiring contributions, advocacy and commitment to increasing equity in physics, including the development of the UK's first network of Black physicists: the Blackett Lab Family.

### **Professor Ian Shipsey FRS Hon.FInstP**

University of Oxford

For leadership in experimental particle physics, particularly the elucidation of the flavour problem and the development of novel instrumentation in many areas of physics, leading the physics community in new scientific directions.

### **Professor Sir Tejinder Singh Virdee KBE FRS CPhys Hon.FInstP**

Imperial College London

For outstanding achievements in particle physics, particularly as a founder of the CMS experiment at the Large Hadron Collider, and their support for physics in Africa.



# Phillips Awards

## Apprentice Award

The IOP Apprentice Award enables the community to recognise and celebrate the skills and experiences of science and engineering apprentices and their contribution to physics.

## Phillips Awards

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### **Dr Hugh Deighton CPhys CSci FInstP**

For taking a leading role in initiating, developing and chairing the Institute of Physics Retired Members' Network, which aims to help members remain active in the physics community in their retirement, and for important contributions to several Special Interest Groups, as well as the London and South East Branch.

### **Dr Francesca Doddato MInstP**

Lancaster University

For outstanding contributions and service to promoting equality, diversity, inclusion and accessibility within the Institute of Physics and creation of the I&D Advocates Initiative.

### **Dr June McCombie MBE CPhys FInstP**

University of Nottingham

For pioneering and sustained contributions to diversity and inclusion within the physics and broader STEM community.

## Apprentice Award

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### **Miss Saskia Burke MInstP**

National Physical Laboratory

For continued excellence in metrology: from underpinning radiopharmaceutical delivery, to winning funding to run her own research into the half-life of silicon-32 by mass spectrometry, improving climate change modelling.

# Isaac Newton Medal and Prize

This award is given for world-leading contributions to physics by an individual of any nationality.

# Max Born Medal and Prize

# The Giuseppe Occhialini Award

# qBIG Prize

## Isaac Newton Medal and Prize

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### **Professor James Binney FRS CPhys FInstP**

University of Oxford

For advancing the science of stellar dynamics and using strong physical intuition to widen and deepen our understanding of how galaxies are structured and formed.

## Max Born Medal and Prize

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### **Professor Ingrid Mertig**

Martin-Luther-University Halle-Wittenberg

For their outstanding contributions to the field of spintronics made possible by their pioneering work combining ab initio electronic structure theory with the analysis of spin- and magnetisation-dependent transport properties.

## The Giuseppe Occhialini Award

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### **Dr. Giovanni Carugno**

Istituto Nazionale Fisica Nucleare

For his contributions to fundamental physics conceiving and developing frontier experiments with novel ideas based on basic properties of matter.

## qBIG Prize

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### **Cerca Magnetics**

Istituto Nazionale Fisica Nucleare

For bringing to market the world's first wearable magnetoencephalography scanner. The device measures human brain function in health and disease, providing unprecedented accuracy and unparalleled practicality.

**Congratulations to the  
IOP award winners  
for their outstanding  
contribution to the  
advancement of physics,  
for the benefit for all.**

**IOP** Institute of Physics

37 Caledonian Road, London N1 9BU

Tel +44 (0)20 7470 4800

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