Tuesday 25 May, 1-2pm

‘Challenge and Change in Science’

Prof Sheila Rowan CBE

School of Physics and Astronomy, U. Glasgow
Chief Scientific Adviser for Scotland

The last five years have seen tremendous changes in science, as well as the wider contexts that have impacted on research. Sheila will reflect on developments in research, as well as her experience of being the Scottish Government’s Chief Scientific Adviser for Scotland. She will also look ahead to her upcoming term as IoP President.

Bio

Professor Sheila Rowan was appointed Chief Scientific Adviser (CSA) for Scotland in June 2016, a part-time position within the Scottish Government where she champions the use of science to inform policy development and is also a keen advocate – across Scotland and further afield – of our world-leading science base.

Sheila also remains Director of the Institute for Gravitational Research, University of Glasgow, a position she has held since 2009. She is also Chair of Natural Philosophy at the University of Glasgow. Sheila received a CBE in 2021.

Sheila’s research is targeted at developing optical materials for use in gravitational wave detectors, and her recent work has been a crucial part of the Advanced LIGO upgrades, carried out between 2010 and 2015, that contributed to one of the most significant scientific breakthroughs of this century: the first detection of gravitational waves announced in February 2016. This resulted in a share of the 2016 Special Breakthrough Prize in Fundamental Physics for her and the members of her team in Glasgow.

Sheila was elected a Fellow of The Royal Society in 2018. She is the President-elect of the Institute of Physics.
‘Watching Chemical Reactions Happen One Molecule at a Time’

Prof Heather J. Lewandowski

JILA and Department of Physics, U. Colorado, Boulder, USA

Reactions between ions and radical molecules play an important role in the chemistry that drives dynamics in the interstellar medium and during combustion of hydrocarbons. Unfortunately, experimental measurements of these reactions are very challenging, and thus very rare. We use tools borrowed from the cold atom community to measure ion-molecule reactions in a well-controlled environment. Here, we can study reactions between atoms and molecules in single quantum states at low temperatures. Our high sensitivity allows us to study reactions where the reaction rate can be as low as one reaction per minute. I will present the capabilities of this cold ion-molecule reaction apparatus and some example reactions we have been able to study using this new system.

Bio

Heather Lewandowski received her B.S. in physics from Michigan Tech in 1997 and her Ph.D. in physics from the University of Colorado in 2002. She was then an NRC Postdoctoral fellow at the National Institute of Standards and Technology in Boulder. She is currently a professor and associate chair of physics at the University of Colorado, and a fellow of JILA. Recently, she was at the University of Leeds as a Fulbright Distinguished Chair during 2019. She leads two research programs, one in experimental molecular physics, and the other in physics education research. Her molecular physics research efforts focus on studying interactions and reactions of cold, chemically important molecules and ions. Her physics education research program studies ways to increase students’ proficiency in scientific practices such as using models and quantitative reasoning in experimental physics.
Thursday 27 May, 1-2pm

‘Applied Research in Photonics: Achieving Impact from Physics’

Prof Martin Dawson

Department of Physics, U. Strathclyde
Head of the Fraunhofer Centre for Applied Photonics

This talk will focus on the role and importance of technological innovation in physics. Using examples from the speaker’s own research and drawing on the various roles he has undertaken in academia, in industry, and in innovation organisations, we will explore the various ways in which innovation works in practise, how it can be encouraged, and the complex interplay that exists between basic and applied research. The talk will also use the example of Fraunhofer to illustrate the importance of maintaining and developing international collaborations and linkages in physics research, especially in post-Brexit Europe.

Bio

Prof Martin Dawson is Director of Research at the University of Strathclyde’s Institute of Photonics (IoP), which he helped establish 25 years ago. He is also, since 2012, the Head and Scientific Director of the Fraunhofer Centre for Applied Photonics, the UK’s first Fraunhofer centre which is co-located with the IoP. Martin is a laser and semiconductor physicist whose research interests span III-V semiconductor materials science, microfabrication and optoelectronic and photonic devices, and extend to applications in communications, sensing, displays and imaging. He is best known for his pioneering contributions to gallium nitride micro-LEDs, optically pumped semiconductor lasers and diamond photonics. Martin has been involved in the creation and development of several spin-out companies, including mLED Ltd which was acquired by Facebook/Oculus in 2016. He holds fellowships of IEEE, OSA, IOP and RSE and he has received several awards for his work including, most recently, the 2021 Nick Holonyak Jr Award from OSA.