

**Department of Physics**

[www.kcl.ac.uk/physics](http://www.kcl.ac.uk/physics)

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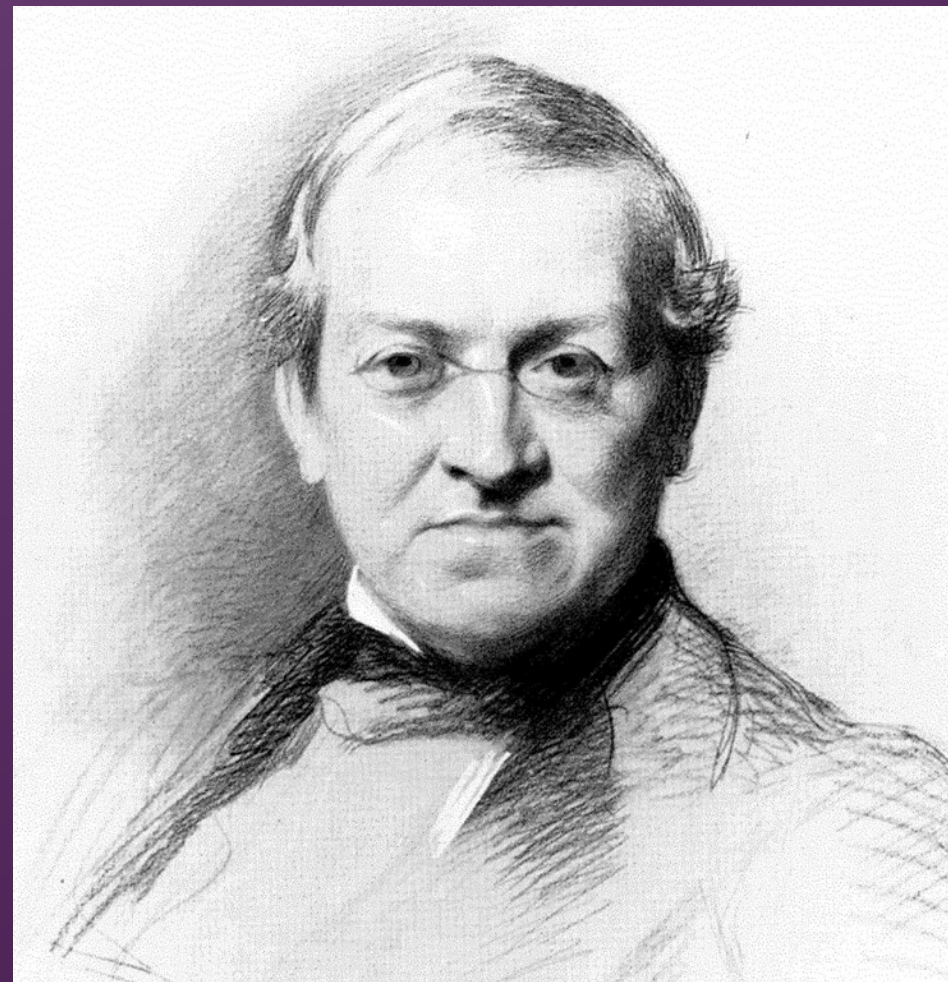
**KING'S**  
*College*  
**LONDON**

## Wheatstone Lecture

Physics has been studied and taught at King's College London since the foundation of the College in 1829 and many distinguished physicists have worked within the department in that time. The first Professor was Sir Charles Wheatstone FRS (1802–1875), who was at King's from 1834 until 1875. Wheatstone was an early pioneer in electronics and invented the first working telegraph line. He also attempted to measure the speed of electric pulses, invented the accordion, and developed stereo photographs. Other former professors include James Clerk Maxwell, who derived the unifying equations of electromagnetism while at King's, and four Nobel laureates: Charles Barkla, Sir Owen Richardson, Sir Edward Appleton and Maurice Wilkins. The X-ray crystallography work by Wilkins, Franklin and Gosling, performed in the Physics Department at King's, led to the discovery of the structure of DNA. Alumni of the Department include Peter Higgs and Michael Levitt, winners of the 2013 Nobel Prizes for Physics and Chemistry, respectively.

The Department today has a reputation as a friendly and supportive environment. The teaching is provided by academic staff with internationally leading standing in areas of current excitement in physics—understanding the physics of the early universe, nanophotonics and nanotechnology, the interface between physics and biology, and the theory and simulation of molecules and materials.

King's College London is one of the top 20 universities in the world (2014-2015 QS international world rankings) and the fourth oldest in England. A research-led university based in the heart of London, it has more than 25,000 students (including more than 10,000 postgraduates) from 140 countries and over 6,500 employees.



**Wednesday 10th February 2016**

# Wheatstone Lecture

## New materials for solar to electric energy conversion: Opportunities and challenges

Among his many achievements, Charles Wheatstone is known for his measurements of electro-motive force (emf) on different materials. The concept of emf lies at the heart of the light-to-electric energy conversion process in a solar photovoltaic device and is responsible for the driving force that enables an illuminated semiconductor do electrical work. In this lecture, we will review the principles and development of photovoltaic materials and devices, with particular attention to materials that can be processed from solution at very low cost. These include molecular semiconductors, which offer an attractive range of properties that can be tuned through design and processing, as well as the challenge of being inherently disordered materials. We will address the application of these and other new materials to solar energy conversion, and consider the factors that limit power conversion efficiency in such devices.

## PROGRAMME

16:00	Welcome from the Head of Department	Professor Peter Main
16:10	New materials for solar to electric energy conversion: Opportunities and challenges	Professor Jenny Nelson
17:00	Questions & Discussion	
17:15	Drinks & Refreshments	In the Old Committee Room

# Professor Jenny Nelson, FRS

Jenny Nelson is a Professor of Physics at Imperial College, London. She obtained her first degree in physics from the University of Cambridge and her PhD from the University of Bristol, where she studied the optical properties of fractals. In 1989, she joined Imperial College, where her research has concentrated on the use of novel varieties of material in solar energy conversion. Her current research is focused on understanding the properties of molecular and hybrid semiconductor materials and their application to solar cells. She also works with the Grantham Institute for Climate Change, also based at Imperial College, to explore the mitigation potential of renewable energy technologies and has links with the Thomas Young London Centre for the Theory and Simulation of Materials. She has published over 200 articles in peer-reviewed journals, several book chapters and has written a popular book: *The Physics of Solar Cells*. She is an ISI Highly Cited Researcher (2014) and was awarded the Institute of Physics' Joule Medal and Prize (2009) and the Royal Society's Armourers' and Brasiers' Company Prize (2012). She has held Greenpeace Research Fellowships (1989 - 1992 and 1996 - 1997), an External Senior Fellowship at the Freiburg Institute for Advanced Studies (2011 – 2012), an EPSRC, Advanced Research Fellowship (1997 - 2003) and a Royal Society Industry Fellowship (2010-2013). In 2014, she was elected as a Fellow of the Royal Society.

