



Next generation materials for solar energy conversion



January 27, 2021 (Wednesday) 5:00 p.m.



Zoom online lecture

<https://hku.zoom.us/j/91321297721?pwd=U1k1b0ZrR3Y5R2JUWmEvVWFvUm5mUT09>

Meeting ID: 913 2129 7721

Password: 2859



*Professor James Durrant
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Abstract:

The development of renewable, low cost energy technologies is now widely considered to be a key scientific challenge for the 21st century. My group's primary research interest is the development of new chemical approaches to solar energy conversion – harnessing solar energy either to produce electricity (photovoltaics) or molecular fuels (e.g. hydrogen). We undertake fundamental scientific studies of new materials and device concepts, aiming to elucidate design principles which enable technological development. Our research is based around using transient laser spectroscopies to undertake transient optical and optoelectronic studies of light driven electron and energy transfer reactions. Such studies are undertaken in parallel with device development and functional characterisation, employing a wide range of molecular, polymeric and inorganic materials.

In my talk, I will start by introducing some of the new materials currently under development for solar energy conversion, identifying the key opportunities and challenges. I will then go on to address the lessons for material and device design which can be learnt from transient spectroscopy studies – focusing in particular on energy and electron transfer kinetics, drawing upon examples of my group's research on organic and perovskite solar cells, as well as metal oxides, conducting polymers and carbon nitrides for photoelectrochemical and photocatalytic fuel synthesis.

Biography:

James Durrant is Professor of Photochemistry in the Department of Chemistry, Imperial College London and Sêr Cymru Solar Professor, College of Engineering University of Swansea. His research addresses the photochemistry of new materials for solar energy conversion – targeting both solar cells (photovoltaics) and solar to fuel (i.e.: artificial photosynthesis). It is based around employing transient optical and optoelectronic techniques to address materials function, and thereby elucidate design principles which can help guide technological development. His research is currently addressing the development and functional characterisation of organic and perovskite solar cells, and photoelectrodes and photocatalysts for solar driven fuel synthesis.

In addition to his core research activities, Professor Durrant leads Imperial's Centre for Plastic Electronics and the Welsh government funded Sêr Cymru Solar initiative. He also founded the UK's Solar Fuels Network, and was founding Deputy Director of Imperial's Energy Futures Laboratory.

His awards include both the Environment (2009) and Tilden (2012) Prizes of the RSC. He was elected a Fellow of the Learned Society of Wales in 2016.

Every one is welcome!