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**Renishaw helps with perovskite solar panel research**

Dr Tim Batten and Dr Ian Hayward represented Renishaw at the recent PSCO-2017 conference on perovskite solar cells and optoelectronics hosted by The Mathematical Institute, Oxford, UK.

Perovskites—normally in the form of hybrid organic-metal lead/tin halides—exhibit promise as solar cell materials, and offer advantages over the more common crystalline silicon. For example, you can coat substrates from solution or by deposition and produce low-cost large-area cells. You can also deposit them on other cell types to produce tandem cells that have a greater light harvesting capability. However, there are potential problems, such as poor long-term stability.

As a result, there has been much research activity, with thousands of papers and articles published in 2016 alone, and much discussion at scientific conferences. The event in Oxford was the third in the PSCO series and attracted 400 delegates with both academic and industrial backgrounds.

Raman spectroscopy is a very useful tool for studying these materials as it reveals detailed composition and microstructural information, and can identify degradation products. Despite this, researchers don’t use it as widely as other techniques, because perovskites are prone to laser damage, making measurements difficult unless the Raman system is appropriately equipped and configured.

Tim Batten presented a technical poster (co-authored with X. Song, P.B. Pillai, and M.M. De Souza of University of Sheffield, and J. Barbe and W.C. Tsoi of Swansea University) which detailed Raman spectroscopy studies of perovskites. Tim and colleagues used five different laser wavelengths, from 488 nm to 830 nm, and determined the most appropriate laser wavelength for typical perovskite measurements. Tim also reported on the maximum laser power levels they could use before sample degradation occurred.

Renishaw’s inVia Raman microscope is ideal for this work. It supports multiple laser wavelengths and you can choose the appropriate one to maximise Raman signal whilst avoiding sample damage. Renishaw’s StreamLine technology also illuminates a line, rather than a spot, on the sample, greatly reducing the power density, preventing damage to the perovskite.

The poster and presentation resulted in many discussions with researchers, with the sharing of information and discussion of possible inVia purchases.

The next PSCO conference will be held in Lausanne, Switzerland from 30 September to 2 October 2018.

**-ENDS-**

**About Renishaw**

Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare. The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery. It is also a world leader in the field of additive manufacturing (also referred to as 3D printing), where it is the only UK business that designs and makes industrial machines which ‘print' parts from metal powder.

The Renishaw Group currently has more than 70 offices in 35 countries, with over 4,500 employees, of which 3,000 people are employed within the UK. The majority of the company's R&D and manufacturing is carried out in the UK and for the year ended June 2017 Renishaw achieved sales of £536.8 million of which 95% was due to exports. The company's largest markets are China, USA, Germany and Japan.

The Company's success has been recognised with numerous international awards, including eighteen Queen's Awards recognising achievements in technology, export and innovation. Renishaw received a Queen’s Award for Enterprise 2014, in the Innovations category, for the continuous development of the inVia confocal Raman microscope. For more information visit [www.renishaw.com](http://www.renishaw.com)

### **For further information**

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