WATERLOO | ENGINEERING
MECHANICAL AND MECHATRONICS ENGINEERING

seminar series

Anodic alumina templates for nanostructured solar cells

Dr. Kevin Musselman

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This lecture will begin by addressing the following question: For many next-generation photovoltaics (solar cells), why is it important to be able to control the dimensions of the semiconductor materials on the nanoscale? We will then discuss one technique for producing 'ideal' nanostructures: electrochemical deposition of semiconducting nanorods into anodic alumina templates. This electrochemical technique uses an aluminium film to produce a self-assembling nanoporous template. The pores are then filled with chemical precursors and an electrochemical reaction induces the formation of nanorods within the nanoscale pores.

Kevin Musselman completed his PhD in Materials Science & Metallurgy at the University of Cambridge under the supervision of Prof. Judith MacManus-Driscoll. He developed new techniques for producing arrays of semiconducting nanorods on transparent conducting substrates, which are suitable for photovoltaic and light-emitting devices. He studied the role of these nanostructures and the interfaces that they form in photovoltaics based on Cu_2O. This work highlighted key device limitations, contributing to the recent efficiency improvements in copper oxide solar cells. In 2010 he was appointed a Junior Research Fellow in the Department of Physics at the University of Cambridge, working in the Optoelectronics Group of Prof. Sir Richard Friend. There he lead a collaborative research program with King Abdulaziz City for Science & Technology in Riyadh, developing novel metal oxide semiconductors for low-cost optoelectronic devices, including colloidal quantum dot solar cells, hybrid organic-inorganic solar cells, and polymer LEDs

DATE: **Friday, September 5, 2014**

TIME: **2:15 – 3:00**

ROOM: **E5 2004**