Swansea Physics Experimental Group Seminars 2010- 2011

Tuesday, 2nd November at 3pm, room 413, 4th floor Vivian Tower

Speaker:
Dr Ota Samek
Institute of Scientific Instruments of the AS CR, v.v.i., Academy of Sciences of the Czech Republic,

Title:
Raman spectroscopy for the characterization of microorganisms

Abstract
Recent advances in the biological sciences and medicine have led to an increasing demand for real time and minimally invasive chemical and structural information on biological materials. It has been shown in many studies that Raman spectroscopy is capable to rapidly identify/discriminate biological samples due to its unique fingerprinting capability. Raman spectroscopy has capabilities to detect and identify important molecular complexes in biological samples and may play an important role in bioengineering. This talk deals with the investigation for compositional analysis of algae and demonstrates the potential of Raman spectroscopy/Raman tweezers to indicate presence of lipids in algae species which are considered to be candidates for biofuel production.

Tuesday, 26th October at 3pm, Room 413, 4th Floor Vivian Tower

Speaker:
Prof Alastair McLean
Department of Physics, Engineering Physics and Astronomy,
Queen's University, Kingston, Ontario.

Title:
Atomic-scale Studies of Domain Boundaries and Molecular Lattices

Abstract
In their recent book*, Michely and Krug argued that "our understanding of crystal growth has always progressed through the closely intertwined development of models and ever more powerful imaging techniques." Although they discuss the interesting history of the screw dislocation in the book, I believe that they had scanning probes and statistical physics at the forefront of their minds. In this talk, I will discuss some studies of atomically ordered domain boundaries and molecular lattices that have involved 'closely intertwined' applications of tunneling microscopy and density functional theory. This will allow me to talk briefly about defect engineering in nano-systems and the role of steric interactions in guiding the formation of molecular lattices on surfaces.
*Islands, Mounds, and Atoms: Patterns and Processes in Crystal Growth Far from Equilibrium, Springer, 2003

Tuesday, 12 October at 2pm in 413

Speaker:
Dr. Chris Parkes, University of Glasgow / CERN

Title:
"It's the end of the world as we know it: The first year of the Large Hadron Collider and its dedicated heavy flavour physics experiment LHCb"

Abstract:
The Large Hadron Collider (LHC) is the new proton-proton collider at CERN. It started its first full physics operation in April 2010. The status of the commissioning, general aims of the project and first physics results will be discussed. Particular emphasis will be placed on LHCb, one of the four large experiments at the LHC. LHCb is dedicated to the study of new physics effects through matter anti-matter asymmetries and rare decays in heavy flavour physics. The silicon vertex locator (VELO) of LHCb will be discussed. This the highest precision detector at the LHC, with a best single hit precision of 4 um having been achieved, and is located only 8mm from the LHC beams.