

**VENUE:** Hume Rothery Lecture Theatre

**Refreshments will be served in the Hume Rothery Building Reception Foyer from 3:30 p.m.**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Colloquium Title and Abstract</th>
</tr>
</thead>
</table>
| 1    | Thursday, 16 October | **Dr Mark Buitelaar, UCL London Centre for Nanotechnology**  
**Radio-frequency reflectometry measurements of nanoparticles and nanotubes**  
In this talk I will focus on radio-frequency reflectometry as a tool to measure individual nanoparticles and nanotubes. In the first part of the talk I will provide some background and describe how this technique simplifies device fabrication and allows measurements of nm sized particles using standard lithography methods. During the second part of the talk I will describe our results on carbon nanotube quantum dots for which this technique is combined with microwave spectroscopy to measure charge relaxation and coherence times. |
| 3    | Thursday, 30 October | **Prof. Dr. Hans-Peter Karnthaler, University of Vienna, Physics of Nanostructured Materials**  
**Unexpected grain size reduction by heating in nanocrystalline FeAl**  
At the beginning I am giving an overview on some of the topics we are interested in like increasing the ductility of a bulk metallic glass by pre-deformation or making intermetallic alloys nanocrystalline or even amorphous by severe plastic deformation. Then I will be talking about our TEM based experimental results, showing that heating can lead to a reduction of the grain size in an already grain refined alloy. This is unexpected as the typical behaviour would be grain growth. Prior to heating the ordered intermetallic alloy FeAl was severely deformed yielding a disordered nanocrystalline structure. By heating, the structure changes to an ordered nanocrystalline one with a 10 times reduced dislocation density and what is most striking with a grain size reduction by 50%. To explain this a model is put forward based on the temperature variation of the values of the coherently scattering domain size, the chemically ordered domain size and the grain size. The nanostructure achieved by heating shows increased hardness and enhanced irradiation resistance. |
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Colloquium Title and Abstract</th>
<th>Host</th>
</tr>
</thead>
</table>
| 4    | Thursday, 6 November | **Prof Dan Hewak**, University of Southampton, Optoelectronics Research Centre  
**Chalcogenides: An advanced functional material**  
This talk will explore the family of materials known as chalcogenides, from their synthesis as bulk glass and thin films through to their wide application space encompassing infrared optics and next generation electronics | HB   |
| 8    | Thursday, 4 December | **Lars Hansen**, University of Oxford, Earth Sciences Dept  
**Deformation of geological materials: The link between olivine microstructure and plate tectonics**  
The mechanical behaviour of geological materials plays a central role in many large-scale processes such as the movement and dynamics of tectonic plates. However, our current understanding of the creep behaviour of rock forming minerals cannot explain some of the central features of plate tectonics.  
Here I describe a recent campaign of laboratory-based experiments that shed light on the manner in which microstructural evolution in olivine ([FeMg]2SiO4) can lead to small- and large-scale strain localization, an essential phenomenon for the formation of tectonic plate boundaries. The dominant deformation mechanism in Earth's upper mantle is demonstrated to be sensitive to grain size and capable of inducing mechanical anisotropy, both of which lead to the formation of shear instabilities. Applicability of the laboratory-derived model to geological conditions is assessed through comparison to naturally deformed rocks. | AJW  |