



Training Day at IMRE

(part of NanoFormulation2011)

Friday, 1 July 2011 • 11.00am – 4.30pm • IMRE, Seminar Room 1



International Year of
CHEMISTRY
2011

Organised by



Introduction

[NanoFormulation2011](#) is the second of three international events organised under an EU-funded programme called InForm (Integrating Nanomaterials in Formulations). InForm, which comprises 17 world-leading research institutions, SME's (small & medium enterprises) and major companies, aims to bring together the scientific knowledge on the formulation of nanomaterials and create an appropriate platform for the dissemination of this first-hand knowledge all over the world. [NanoFormulation2011](#) is an independent event integrated within the ICMAT (International Conference on Materials for Advanced Technologies) framework and is an official event of the International Year of Chemistry.

<http://www.nanoformulation2011.com/>

The Formulation Science and Technology Group (FSTG):

The FSTG is an interest group of the Royal Society of Chemistry, UK. The FSTG is the leading scientific organisation dedicated to all aspects of product formulation, from initial product concept to manufacture. The FSTG fosters the advancement of formulation science across multi-disciplines scientific sectors including: biology, chemical engineering, physics, and across its many industrial applications: cosmetics, pharmaceuticals, foods, detergents, fuels and paints. The FSTG works for the benefit of its members and actively promotes technology exchange through conferences, training days and networking events.

<http://www.formulation.org.uk>

NanoTechnology in Singapore:

Nanotechnology is recognised as a key enabler to sustain future development of the Singapore economy and Singapore agencies have put more and more emphasis on it since the late 1990s in response to growing awareness of nanotechnology worldwide. The Singapore government spent about US\$300 million between 2003 and 2007 in nanotechnology-related research and development (R&D) and manpower development. Today, Singapore is home to one of the largest nanotech community in the region. Currently the nanotechnology community in Singapore includes more than 50 companies and research organisations with over 1,000 researchers, scientists and engineers challenging the frontiers of size.

Research in nanotechnology mainly takes place in the two technological universities in Singapore namely, National University of Singapore (NUS) and Nanyang Technological University (NTU) and Agency for Science, Technology and Research (A*STAR) Research Institutes (RIs).

A*STAR Research Institutes:

Among the 14 A*STAR Research Institutes, nanotechnology related research is concentrated in the Institute of Bioengineering and Nanotechnology (IBN), Institute of Materials Research and Engineering (IMRE), Singapore Institute of Manufacturing Technology (SIMTech), Institute of Chemical and Engineering Sciences (ICES), Institute of Microelectronics (IME), and Data Storage Institute (DSI). The Science and Engineering Research Council (SERC) in A*STAR has setup the SERC nano Fabrication, Processing and Characterisation (SnFPC) facility in IMRE making available its fabrication and characterisation facilities to the nano-tech community in Singapore.

Training Day at Institute of Materials Research and Engineering (IMRE):

The Institute of Materials Research and Engineering (IMRE), is a research institute of the Science and Engineering Research Council (SERC), Agency for Science, Technology and Research (A*STAR). Established in September 1997, IMRE have built strong capabilities in materials analysis, characterisation, materials growth, patterning, fabrication, synthesis and integration. IMRE is an institute of talented researchers equipped with state-of-the-art facilities such as the SERC Nanofabrication and Characterisation Facility to conduct world-class materials science research. Leveraging on these capabilities, IMRE's R&D programmes include research on organic solar cells, nanocomposites, flexible organic light-emitting diodes (OLEDs), solid-state lighting, nanoimprinting, microfluidics and next generation atomic scale interconnect technology. IMRE Training Day is integrated within the *NanoFormulation2011* programme and will be focused on nanomaterial characterisation. The program will be held at, and jointly with, the Institute of Materials Research and Engineering (IMRE).

<http://www.imre.a-star.edu.sg/>

Objective

The aim of this Training Day is to showcase excellent nanoscience research within Singapore and offer delegates from both academia and industry, across all world regions, the chance to observe laboratory demonstrations for the characterisation techniques utilised for studying nanostructures.

The Training Day will:

- Allow the researcher an insight into one of Singapore's world-leading research institute.
- Offer the opportunity to experience how nano-research is carried out using current advances in nanotechnology for formulated products.
- Facilitate exchange of ideas and knowledge.
- Gather together scientists from various fields and expertise.
- Create avenues for possible future collaborations.

Programme

11.00am	Group Arrival at IMRE
11.05am	Introduction to the Training Day <i>by Dr Richard Greenwood, EngD Programme Manager, University of Birmingham, UK</i>
11.15am	Welcome and Introduction to IMRE <i>by Dr Jasbir Singh, Director, Industry & Enterprise, IMRE A*STAR, Singapore</i>
11.30am	Plenary Talk: Nano-Object Characterisation and Standardisation <i>by Dr Charles Clifford, Senior Research Scientist: Nanoanalysis Group, National Physical Laboratory, UK</i>
12.00pm	Talk 1: Application of STEM, EELS and Tomography to Characterisation on Nanoparticles <i>by Dr Lin Ming, Scientist I, IMRE A*STAR, Singapore</i>
12.20pm	Talk 2: Surface and Interface Property Characterisation and Their Characterisation in Nanoparticle Systems <i>by Dr Pan Jisheng, Senior Scientist I, IMRE A*STAR, Singapore</i>
12.40pm	Talk 3: New Techniques for Nanoparticle Characterisation in Liquids <i>by Dr Victoria Coleman, Research Scientist: Nanometrology Section, National Measurement Institute, Australia.</i>
1.00pm	Talk 4: Characterisation of Nanoparticle for In-Vivo Drug Delivery <i>by Dr Christine Vauthier, Director of Research, CNRS and Université de Paris Sud-11, France</i>
1.30pm	Lunch
2.30pm	IMRE Laboratories Tour*: <ol style="list-style-type: none"> 1) Electron Microscopy Laboratories: Demo on measurement of nanoparticles to show the application of TEM in various modes: TEM, STEM, EELS, EDS; 2) XPS and ToFSIMS Laboratories: Demo on characterisation of nanoparticles and highlight the relative advantages of the two techniques; 3) NMR (solid/liquid) Laboratories: Explanation on the use of NMR on nanoparticle and formation characterisation; 4) AFM/SPM Laboratories: Demo on morphological characterisation of polymer coating. <i>by IMRE Researchers, IMRE A*STAR, Singapore</i>
4.30pm	End of IMRE Training Day and NanoFormulation2011 Closing Remarks <i>by Dr David Higgins, FSTG Chairman</i>

* Consists of tours to 4 laboratories with various characterisation tools. Split into 4 groups of people with 10 – 12 pax each. Duration at each laboratory will be capped at 30 minutes.