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Nanoscale Organisation  
and Dynamics Group

## Functional Magnetic Nanoarchitecture

**Gurvinder Singh**

**School of Biomedical Engineering, The University of Sydney**

### **Abstract**

Size- and shape-controlled magnetic nanoparticles exhibit appealing magnetic properties, which have led to their potential applications in magnetic resonance imaging (MRI) contrast enhancement agents, drug delivery, magnetic actuation, and magnetic hyperthermia. However, the challenge is to optimize the design criteria (size, shape and crystal structures) of magnetic nanoparticles because the practical applications of magnetic nanoparticles depend on their magnetic properties. For example, the magnetic nanoparticles of the high magnetic moment are required for use as a contrast agent in MRI but not suitable for therapeutic applications. The quest for better performance demands to design next-generation magnetic nanomaterials from the self-assembly of either atoms or nanoparticles. In my presentation, I will discuss the critical design criteria for next-generation high performance multifunctional magnetic nanomaterials at different length scale and their potential applications to MRI contrast agent, drug delivery, and magnetic hyperthermia.

### **Profile**

Dr. Gurvinder Singh is a Research Fellow at the School of Biomedical Engineering, the University of Sydney. He obtained his bachelor's degree in Materials Engineering from Indian Institute of Technology, Roorkee, India in 2004, master's degree in Nanomaterials from Ulm University, Germany in 2006, and PhD in Nanotechnology from Aarhus University, Denmark in 2011. He worked as postdoctoral researcher and research scientist at Weizmann Institute of Science, Israel, and the Norwegian University of Science and Technology, Norway. His research focuses on investigating new synthetic scalable approaches to design functional biocompatible nanomaterials across different length scales that can respond to evolving applications such as imaging, sensing, diagnosis and medicine. He has authored more than 65 peer-reviewed articles in leading journals, including Science, Advanced Materials, ACS Nano, Advanced Functional Materials. He has obtained research funding of over 2 Million AUD as a lead CI and partner CI on several projects funded by the Norwegian Research Council and Industries, including recent equipment "Magnetic Hyperthermia" grant from NHMRC. He is recipient of AkzoNobel Nordic Research award in the field of Nanobiotechnology (2015, Sweden).

**Staff and students at all levels are welcome to attend.**

### **Venue and Time:**

This talk will be held on Tuesday 13 October at 2 pm via **ZOOM**

Meeting URL: <https://uws.zoom.us/j/98557079852?>

Meeting ID: 985 5707 9852

Password: 490438

### **Enquiries:**

Prof. William S. Price

Ext. 0404 830 398 e-mail: [w.price@westernsydney.edu.au](mailto:w.price@westernsydney.edu.au)