

Prof. Dr. John Bartlett

Executive Dean, Faculty of Science, Health, Education and Engineering

BSc (Hons) *Newcastle (NSW)*, PhD *Newcastle (NSW)*.

Teaching areas

- Nanotechnology
- Materials Chemistry
- Sol-Gel Chemistry
- Vibrational Spectroscopy
- Small angle scattering

Research areas

- sol-gel chemistry for the synthesis of nanostructured materials, particularly at temperatures compatible with polymeric and biological substrates
- atomic layer deposition, for the production of multilayered coatings with controlled nanostructures
- synthesis and sol gel chemistry of titanium (IV) oxoalkoxy nanoclusters as building blocks for the assembly of novel nanostructured materials at low temperatures
- synthesis and applications of self assembling organic/inorganic nanohybrids
- encapsulation of functioning biological species (including enzymes and bacteria) in nanostructured inorganic hosts
- encapsulation and controlled release of biologically active molecules (eg controlled drug delivery)
- synthesis of metal oxide nanoparticles (including titania, zirconia, alumina, ceria, silica, and mixtures thereof) in bulk solution and in emulsions/microemulsions
- effect of surface functional groups on the peptisation, stabilisation and crystallisation kinetics of metal oxide nanoparticles (particularly titanate based systems) in aqueous solution
- characterisation techniques such as small angle neutron and x ray scattering, light scattering, vibrational spectroscopy (infrared and Raman), etc.

Profile

Professor Bartlett joined the University of the Sunshine Coast in 2012 and has over 25 years experience in synthesis and characterisation of nanomaterials and nanoscale systems.

His interests include the development of chemical strategies for producing self assembling organic/inorganic nanohybrids based on silica and titania sol gel chemistry, where organic groups capable of forming supramolecular architectures by exploiting well defined interactions such as steric effects, H bonding, pi-pi interactions and hydrophobic/hydrophilic interactions are used to control the structural evolution of the nanohybrids.

As Executive Dean, Professor Bartlett aims to enhance the Faculty's tradition of innovative teaching and research through a platform of engagement and research excellence, depth and intensity in strategic areas.

Current research projects

- Institute de Chimie Separative de Marcoule, France, (Professor Thomas Zemb): (a) investigations of local nanostructure and interfacial segregation in mixed oxide nanoparticles/gels and thin films, using small angle x-ray and neutron scattering; (b) adaptive organic/inorganic nanohybrid coatings; (c) self repairing materials.

Ecole Nationale Supérieure de Chimie de Montpellier, (Dr Michel Wong Chi Man), (a) novel precursors for self assembly of organic inorganic nanohybrids; (b) molecular recognition; (c) immobilisation of proteins in nanostructured inorganic hosts.