

**Institute for Mathematics and its Applications**  
**2012 Seminar Series**  
University of Wollongong

**Title:** Analysis on infinite-dimensional spaces: from qualitative stability to quantitative

**Speaker:** Sergey Ajiev (University of New South Wales)

**Time and Date:** 3:30pm, Monday 7 May 2012

**Location:** Room 8-G25

**Abstract:** Approximation theory is a classical part of the analysis of functions defined on an Euclidean space or its subset and the foundation of its applications, while the problems related to high or infinite dimensions create known challenges even in the setting of Hilbert spaces. The stability (uniform continuity) of a mapping is one of the traditional properties investigated in various branches of pure and applied mathematics and further applications in engineering. Examples include analysis of linear and non-linear PDEs, (short term) prediction problems, decision-making and data evolution. We describe the uniform approximation properties of the uniformly continuous mappings between the pairs of Banach and, occasionally, metric spaces from various wide parameterised and non-parameterised classes of spaces with or without the local unconditional structure in a quantitative manner. The striking difference with the finite-dimensional setting is represented by the presence of Tsar'kov's phenomenon. Many tools in use are developed under the scope of our quasi- Euclidean approach. Its idea seems to be relatively natural in light of the compressed sensing and distortion phenomena.