

IMIA Operator Algebra and Noncommutative Geometry Seminar
University of Wollongong

Title: KMS states on k-graph algebras

Speaker: Aidan Sims (University of Wollongong)

Time and Date: 3:30pm Thursday, 22 and 29 May 2014

Location: Room 39C.meeting room

Abstract: Enomoto, Fujii and Watatani showed in the early 1980s that the C^* -algebra of a finite strongly-connected directed graph admits a unique KMS state for its gauge action. If we think of KMS states of $C^*(E)$ as KMS states of its Toeplitz extension that factor through the quotient map, the Enomoto-Fujii-Watatani result fits the by-now familiar template whereby the KMS simplex of the Toeplitz extension is large in this instance, its extreme points are indexed by the vertices of the graph at high inverse temperatures, but collapses dramatically at a critical temperature.

In this talk I will discuss the corresponding situation for strongly-connected higher-rank graphs. I'll discuss a complete description of all the KMS states on both the k-graph C^* -algebra and its Toeplitz extension. In particular, I'll discuss how the phase-change at the critical temperature here can be very different than those seen in other graph-based examples: for many k-graphs the KMS simplex, which is always finite-dimensional at large inverse temperatures, jumps up to an infinite-dimensional simplex at the critical temperature.