

**IMIA Operator Algebra and Noncommutative Geometry Seminar**  
University of Wollongong

Title: Representations of the Free Group: Duplicity

Speaker: Tim Steger (Universita' di Sassari)

Time and Date: 3:30pm Thursday, 26 June 2014

Location: Room 39C.meeting room

Abstract: Let  $\Gamma$  be a non-abelian free group. Fixing any set of free generators and constructing the Cayley graph of  $\Gamma$ , one obtains a tree. Let  $\Omega$  be the boundary of that tree. Let  $A$  be the reduced  $C^*$ -algebra of  $\Gamma$ , and let  $B$  be the crossed product algebra  $\Gamma \rtimes C(\Omega)$ . The map  $A \rightarrow B$  is an inclusion.

Fix some irreducible representation  $\pi$  of  $A$ . In how many different ways can  $\pi$  be embedded in an irreducible representation of  $B$ ? Equivalently, if  $\phi$  is a pure state of  $A$  corresponding to some non-zero vector for  $\pi$ , in how many different ways can  $\phi$  be extended to a pure state of  $B$ ? For many representations  $\pi$ , the answer is known to be one or two, and it is reasonable to conjecture that these are the only possible answers.