

IMIA Operator Algebra Seminar
University of Wollongong

Title: The fundamental theorems of invariant theory and the Brauer category

Speaker: Gus Lehrer (University of Sydney)

Time and Dates: 3:30pm Thursday, 15 November 2012

Location: Room 6.210

Abstract: The fundamental theorems of invariant theory describe generators and relations for algebras of invariants, or equivalently, algebras of endomorphisms of tensor space, with respect to the action of an algebraic or quantum group. In 1937, Brauer showed that for classical groups, these endomorphism algebras are quotients of the ‘Brauer algebras’, which he described in terms of Brauer diagrams, but which are generically not semisimple. However he was unable to determine the kernel of the Brauer algebra action. In recent work, Ruibin Zhang and I have shown that the kernel is generated by a single idempotent, which we describe explicitly. The most efficient way of proving the result is through the Brauer category, which I shall describe in terms of pictures. Our results are all valid for quantum group actions on tensor space, in which case the Brauer algebras are replaced by the BMW algebras of oriented link theory. The connection between the quantum and classical cases is made through the theory of cellular algebras.