## Graduate Talk

### Analytical and combinatorial aspects of subfactors

Vaughan Jones initiated in the early 80's the theory of subfactors, a theory which deals with certain highly non-commutative, infinite dimensional probability spaces. These subfactors turn out to display surprising rigidity phenomena which ultimately led Jones to the discovery of his famous knot invariant, the Jones polynomial. In this talk, I will explain the basic concepts and ideas in the theory of subfactors and show some of the beautiful discrete structures which arise naturally.

## Colloquium I

### Subfactors and planar algebras

A subfactor can be viewed as a group-like object which encodes what one might call the *generalized symmetries* of the mathematical or physical situation from which it was constructed. A new algebraic-combinatorial structure, the so-called *planar algebras*, leads to a powerful tool with which one can manipulate the symmetry operators associated to a subfactor using a diagrammatic calculus. In this talk, I will explain this calculus and show how familiar algebras, such as the Temperley-Lieb algebras, can be viewed as planar algebras.

## Colloquium II

### Subfactors via generator and relations

The Fuss-Catalan algebras, discovered by Jones and myself, are the fundamental symmetries associated to a subfactor whenever an intermediate subfactor is present. These algebras arise as "planar algebra free products" of Temperley-Lieb algebras and can be viewed as being generated by a single operator (as a planar algebra). I will try to explain how planar algebras are natural tools in the classification of subfactors and how our notion of planar algebra free product fits nicely with Voiculesu's free probability theory (joint work with Jones).