John Barrett (University of Nottingham)

Title: “Non-commutativity and the Dirac operator”

Abstract: In the first part of the talk I will describe how the fields and action of the standard model of particle physics respect the structure of a non-commutative geometry. The framework is Connes' version of non-commutative geometry, based around the mathematical structure of the Dirac operator. In the second part of the talk I will discuss - more speculatively - how I hope to use a similar mathematical structure to describe space-time with a finite Planck scale. Along the way I will try to discuss what it takes to invent a new physical theory and how this differs from calculating the consequences of an existing one.