Meeting: 1001, Evanston, Illinois, SS 19A, Special Session on Algebraic Representations and Deformations

1001-51-260 **K. C. Hannabuss** and **S. J. Brain*** (brain@maths.ox.ac.uk). *The Noncommutative Ward Correspondence.* Preliminary report.

We explore the problem of generalizing the Penrose-Ward transform to the framework of Noncommutative Geometry. In the commutative case, one uses the correspondence between space-time $\mathbb{C}^4$ and its twistor space $\mathbb{CP}^3$ to construct self-dual connections.

Our goal is to understand how the *Ward correspondence* between certain vector bundles over $\mathbb{CP}^3$ and self-dual connections on bundles over compactified Minkowski space $\mathbb{CS}^4$ generalizes to the noncommutative paradigm. It is shown that this correspondence, upon translation into the language of Noncommutative Geometry, equates to a Morita equivalence between the algebras $C(G/H) \rtimes K$ and $H \ltimes C(G/K)$, where twistor space and Minkowski space are realized as flag manifolds G/H, G/K respectively. One may then use standard induction of representations to transform bundles over twistor space into bundles over Minkowski space equipped with a self-dual connection, and *vice versa*.

We then show that this Morita equivalence survives the Moyal deformation of space-time, thus setting up a noncommutative version of the Ward correspondence. (Received August 28, 2004)