

John Phillips

speaks on:

**AN INDEX THEORY FOR CERTAIN GAUGE INVARIANT KMS
WEIGHTS ON C^* -ALGEBRAS**

April 5, 2008

10:30am at the
Fields Institute, Toronto

Bimonthly Canadian Noncommutative Geometry workshop.

Abstract

We present, by examples, an index theory appropriate to algebras without trace. In particular, our examples include the Cuntz algebras and a separate class of C^* -algebras that generate all injective III_λ factors for $0 < \lambda < 1$. Our main result is an index theorem (formulated in terms of spectral flow) using a twisted cyclic cocycle where the twisting comes from the modular automorphism group for the canonical gauge invariant KMS state in the case of the Cuntz algebras (in the other examples we use the modular automorphism group coming from a natural weight). We introduce a modified K_1 -group for these algebras that we can pair with this twisted cocycle. As a corollary we obtain a noncommutative geometry interpretation for Araki's notion of relative entropy in the Cuntz examples. This is joint work with Alan Carey and Adam Rennie.

The next lecture, by [Alexander Gorokhovsky](#) (U. Colorado) will be in the month of June, at the Fields Institute. A precise date will be announced later.

This **bimonthly workshop** aims to cover new developments in Noncommutative Geometry, and each workshop features a keynote address by one of the top people in the field. The general theme for the first year is index theory. Lectures take place at the [Fields Institute](#) in Toronto, Canada.

Support for [graduate students](#) is available, please enquire, negworkshop@unb.ca.

Organizers:

Masoud Khalkhali, Dan Kucerovsky, Bahram Rangipour

This workshop is associated with the Center for Noncommutative Geometry and Topology at the University of New Brunswick, www.math.unb.ca/~dan/copal/Centre_main.htm, and with the math department at UWO. We thank the Fields Institute for financial support.