



Department of Mathematical Sciences welcomes

Hang Wang East China Normal University

Index Theory of Elliptic Operators on Spaces with Symmetries

ABSTRACT:

In differential geometry, the Atiyah-Singer index theorem, by means of calculating the Fredholm index of an elliptic operator on a closed manifold, creates an amazing link between analytic and topological invariants of the manifold. It unifies in various geometric settings several beautiful theorems, such as the Gauss-Bonnet theorem and the Riemann-Roch theorem.

One of the most exciting generalizations of the Atiyah-Singer index theorem is equivariant index theory of elliptic operators on a noncompact space with symmetries, due to its connection to several important subjects and problems in topology, geometry and representation theory. For example, a famous open problem in topology about homotopy invariance of higher signatures, known as the Novikov Conjecture, is formulated in this framework.

After the introduction, we will present a noncompact analogue of the Atiyah-Segal-Singer fixed point theorem for compact group actions and use it to recover Harish-Chandra's character formula for a certain class of representations of a semisimple Lie group. This work represents a fusion of index theory and representation theory in the context of operator algebras. This is joint work with Peter Hochs.

ABOUT THE SPEAKER:

Hang Wang's research focuses on index theory and non-commutative geometry, and their connections to representation theory. She received her Ph.D. from Vanderbilt University in 2011, under the supervision of Professor Gennadi Kasparov. She spent several years as a fellow of the Institute of Geometry and Applications at the University of Adelaide before joining the faculty at East China Normal University.

September 20, 2019

Hosted by:
Prof. Dan Ramras

Tea begins at 3:00
in LD 259

Research Topic
begins at 3:30
in LD 229

