



**PURDUE UNIVERSITY**

**Department of Mathematics Colloquium**

Speaker: Professor Jacek Brodski, University of Southampton, UK  
Title: "Why Can't Metric Spaces be More Like Groups"  
Date: Tuesday, October 6, 2009  
Time: 4:30 P.M.  
Place: MATH 175

**Abstract**

A discrete group can be regarded as a geometric object, indeed, it can be equipped with an invariant metric in a variety of ways. The resulting geometry has of course a high degree of symmetry which, when applying ideas from coarse geometry, can be captured analytically. A useful object in the study of the interplay between the geometry and representation theory of a group is the reduced  $C^*$ -algebra. Metric spaces have a priori no such symmetry available and so the amount of analytic information that can be obtained about a given discrete metric space is quite limited. This talk will explore recent ideas that allow, to a certain extent, to blur the boundary between discrete groups and discrete metric spaces, and in particular lead to a natural construction of a  $C^*$ -algebra of a metric space with a sufficient amount of partially defined symmetries that can be detected analytically. We will give explicit examples of how such algebras arise for subspaces of trees, and show how our construction unifies some very well known classical results. We will then consider a more general cases of subspaces of groups and present a scheme for computing the K-theory for  $C^*$ -algebras associated with such spaces.

Refreshments will be served in the Math Library Lounge at 4:00 p.m.