

The **Department of Mathematical Sciences** presents a colloquium with

Professor Jeremy Tyson

University of Illinois at Urbana - Champaign

Thursday, April 21, 2016

4 - 5 pm

Room 273 WCharlton Hall

Distortion of dimension by Sobolev and quasiconformal mappings

The behavior of a mapping on a typical member of a parameterized family of subsets may be significantly better than its worst-case behavior. For instance, quasiconformal mappings are absolutely continuous along almost every line in a fixed direction, but can distort individual lines rather badly. I will discuss the effect of quasiconformal--- or more generally, supercritical Sobolev---mappings on the Hausdorff dimensions of generic parallel m -dimensional subspaces. Here, generic refers to an almost everywhere conclusion with respect to a suitable measure, typically also a Hausdorff measure, on the parameterizing orthogonal complement. Such results hold in general for Sobolev mappings into metric spaces, but are new already for quasiconformal mappings of the plane. Recent constructions of Bishop, Hakobyan and Williams (in dimension two), and Balogh, myself and Wildrick (in all dimensions) show that these results are sharp even in the quasiconformal category. On the other hand, there exist critical Sobolev surjections from low-dimensional cubes onto cubes of arbitrarily large dimension (Sobolev Peano cubes).

This talk is based on joint work with Zoltan Balogh, Roberto Monti, Kevin Wildrick, and Piotr Hajlasz.

Refreshments will be served 3:15 – 3:45 pm
in the Faculty & Graduate Student Lounge
Room 4118 French Hall West