

BI-CO MATHEMATICS COLLOQUIUM

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“The Simplicity Conjecture”

Monday, February 24, 2020

Talk at 4:00 – Park 338

Tea at 3:30 – Park 361, Math Lounge

Abstract:

In 1980, Fathi showed that the group of compactly supported area-preserving homeomorphisms of the n -ball is a simple group when $n \geq 3$, and asked whether or not this group is simple in the $n = 2$ case. My talk will be about recent joint work showing that in the $n = 2$ case, this group is in fact not simple. This answers what is known as the “simplicity conjecture” in the affirmative.

The talk will be aimed for a wide audience, and no particular background will be assumed. In particular, in the first part of the talk, I will explain the relevant terminology --- what is meant by a compactly supported area-preserving homeomorphism, and a simple group --- and I will say a bit about the history of the problem. Then, I will explain the crux of the issue: trying to recover the “Calabi homomorphism”, which has a definition involving derivatives, in terms of quantities that make sense even for functions that are not differentiable. These quantities, which are called “spectral invariants”, are defined using Floer homology, and I will give a brief non-technical sense of how this works.

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