USNA Operator Algebra Seminar

Groupoid actions on fractafolds

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Date: Friday, 15 November 2013

Time: 3:45-4:45pm

Location: Chauvenet 320

Abstract: Strichartz defined a fractafold to be the equivalent of a manifold when the underlying space is a fractal instead of an Euclidean space. A particular class of fractafolds are the so called fractafold blowups. For example, one can view the real line as a fractadold blowup of the unit interval. In this talk that is based on joint work with Alex Kumjian, I present our attempt to find and analyze symmetries of fractals associated to iterated function systems and to study the associated C^*-algebras that might arise from the dynamics. Our starting point is Strichartz's construction of a family of fractafold blowups of the invariant set of an iterated function system which is parameterized by a Cantor set. He observed that two such blowups are naturally homeomorphic if the parameterizing words are eventually the same. We endow these fractafold blowups with the inductive limit topology and assemble them into a fractafold bundle. In general there do not appear to be any natural nontrivial symmetries of a generic blowup but Stichartz's observation suggests that we look for symmetries of the bundle instead. Indeed we show that the homeomorphisms between fibers observed by Strichartz give rise to a natural groupoid action on the fractafold bundle. This groupoid action and the associated action groupoid constitute the main objects of this presentation