Topology Seminar

Elden Elmanto

of Harvard University will be speaking on

On the K-theory of Universal Homeomorphisms

on October 7 at 4:30 in
MIT Room 2-131

A universal homeomorphism of schemes is a morphism of schemes (frighteningly, with no finiteness conditions) which is a homeomorphism on underlying topological spaces (!) and remains so after arbitrary pullback. In some sense, beginning with at least Grothendieck, one should view a universal homeomorphism as analogous to the topologists' notion of a "weak equivalence." In this talk, I will explain this philosophy, give examples, and explain two results about the behavior of algebraic K-theory under universal homeomorphisms. The first is an equicharacteristic result: if k is a field of exponential characteristic c, then homotopy K-theory is invariant under universal homeomorphisms of k-schemes, after inverting c; this is a consequence of joint work with Adeel Khan and implies the statement for usual K-theory in positive characteristics. The second is a mixed characteristic result for usual (but p-inverted) K-theory: over Z_p schemes, universal homeomorphisms are completely controlled by its "characteristic zero part." The formulation of the theorem, and its proof, is inspired by some results in mixed characteristic birational geometry. This is joint work in progress with Akhil Mathew and Jakub Witaszek.

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