Topology, Algebraic Geometry, & Dynamics Seminar

Hilbert Schemes and the Motivic Sphere Spectrum.

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The first iteration, due to Quillen, of higher algebraic K-theory of a ring R is defined as applying group completion to the topological monoid $\coprod_n BGL_n(R)$. While easy to define, it is not robust enough to prove most basic theorems in algebraic K-theory which necessitates the more sophisticated second (Quillen's Q-construction) and third (Waldhausen's $S_\bullet$) iterations of the theory. However, the first iteration is still of great computational value as it is an explicit model for algebraic K-theory; the only known way to compute the algebraic K-theory of finite fields require this model.

Algebraic K-theory is but one animal in a zoo of invariants that one can attach to schemes. A more "initial" object, at least over regular rings, is the "motivic sphere spectrum," which starts out from a sophisticated definition as the unit of a certain symmetric monoidal (∞)-category. We prove that the motivic sphere spectrum is the group completion of a certain monoid built out of Hilbert schemes, hence giving a model which we hope to be computationally tractable. Time permitting, we will also discuss models for algebraic cobordism.

This is joint work with Hoyois, Khan, Sosnilo, Yakerson and is part of arXiv:1711.05248.

Date: **Friday, March 2, 2018**
Time: **2:30-3:20 pm**
Place: **4106 Exploratory Hall**

For special accommodations, please contact Sean Lawton via email at `slawton3@gmu.edu`.