

Speaker: Michael Mandell (University of Indiana)

Title: Trace methods for the algebraic K-theory of the sphere spectrum

Abstract:

The Goodwillie-McCarthy-Dundas theorem shows that TC has a lot to say about the algebraic K-theory of connective ring spectra. The K-theory of the sphere spectrum, also known as Waldhausen's K-theory of a point, encapsulates information about the differential topology of high dimensional highly connective manifolds. Rognes studied this spectrum at regular primes. More recent joint work with Blumberg gives information at all odd primes. I will talk about these results with emphasis on the role played by TC.

Speaker: Nick Rozenblyum (University of Chicago)

Title: Noncommutative stratifications and equivariant homotopy theory

Abstract:

In this talk, I will describe a noncommutative analogue of stratifications. I will explain how the equivariant stable homotopy category admits a natural stratification which gives a particularly simple presentation of this category. Using this stratification, we give a new description of the category of cyclotomic spectra (generalizing work of Nikolaus-Scholze) which is a natural recipient for THH and the cyclotomic trace map, as will be explained in David Ayala's talk. This is joint work with David Ayala and Aaron Mazel-Gee.

Speaker: David Ayala (Montana State University)

Title: Geometry of the cyclotomic trace

Abstract:

This talk will begin with an outline of the Denis trace map, from the algebraic K-theory of a stable ∞ -category to its topological Hochschild homology, THH. We will give an explicit description of this trace map in the case of Perf_X , for X a derived scheme. We will then consider increasing symmetries on THH, in concert with observing that the Denis trace map is invariant with respect to it. The discussion will culminate as the cyclotomic trace map from algebraic K-theory to topological cyclotomic homology, TC. This will be described explicitly in the case of Perf_X . These symmetries, and this invariance of the trace map, will be swiftly accommodated using an albro-geometric description of genuine equivariant spectra of Nick Rozenblyum's earlier talk. Premised on that, I'll offer an albro-geometric description of cyclotomic spectra, as well as of TC.

This is a report on joint work with Aaron Mazel-Gee and Nick Rozenblyum, which builds on work, in particular, by Blumberg-Mandell, Barwick-Glasman, and Nikolaus-Scholze.

Speaker: Dmitry Kaledin (Steklov Mathematical Institute)

Title: Bokstedt periodicity and Bott periodicity

Abstract:

One of the miracles of Topological Hochschild Homology is that THH of the prime field \mathbb{F}_p is extremely simple (a polynomial algebra in one variable of degree 2). The fact has been known since the work of Bokstedt in the 80-ies (and for Mac Lane Homology, that of Breen in the 70-ies), and there are several beautiful proofs in the literature, but none are easy. I am going to present yet another and somewhat simpler proof based on K-theory methods, and discuss what a dream proof would be.

Speaker: Akhil Mathew (University of Chicago)

Title: $K(1)$ -local K-theory

Abstract:

Let R be a ring. We consider the algebraic K-theory $K(R)$ of R , and then localize at $K(1)$ (mod p topological K-theory) at the prime p ; explicitly this corresponds to inverting a Bott type element, and was first considered by Thomason for $\mathbb{Z}[1/p]$ -algebras. We show that the $K(1)$ -localization of $K(R)$ agrees with that of $K(R[1/p])$. Our method relies on the cyclotomic trace and the connection between TC and p -adic cohomology developed by Bhatt, Morrow, and Scholze. This is joint work with Bhargav Bhatt and Dustin Clausen.

Speaker: Aaron Mazel-Gee (University of Southern California, LA)

Title: The secondary cyclotomic trace

Abstract:

Secondary algebraic K-theory is a categorified analog of algebraic K-theory, which studies a scheme not through its quasicohherent sheaves of vector spaces but through its quasicohherent sheaves of categories. It is a highly nontrivial invariant, with connections to Azumaya algebras, Brauer groups, and motivic measures (and conjecturally to elliptic cohomology and to Fukaya categories). In this talk, I'll explain joint work with Reuben Stern that provides a universal characterization of secondary K-theory, analogous to the universal characterization of K-theory due to Blumberg–Gepner–Tabuada. I'll also describe the “secondary cyclotomic trace” that results from this, as well as its interpretation in terms of derived algebraic geometry. Its target is a 2-dimensional analog of TC, which is premised on a “2-cyclotomic structure” on iterated THH. This builds on joint work with (and earlier talks of) David Ayala and Nick Rozenblyum.

Speaker: Benjamin Antieau (University of Illinois at Chicago)

Title: The Beilinson t-structure and TC.

Abstract:

I will discuss the Beilinson t-structure on filtered spectra and how to use it and the cyclotomic t-structure to recover the Bhatt–Morrow–Scholze filtration on TC. This is joint work with T. Nikolaus.