

# CHROMATIC HOMOTOPY, $K$ -THEORY AND FUNCTORS

CIRM, LUMINY, 23-27.01.2023

## SHORT TALKS

Wednesday, 25.01,2023

20:30 **Sarah Petersen** (University of Colorado Boulder): *A Thom Spectrum Model for  $C_2$ -Integral Brown-Gitler Spectra.*

We make a Thom spectrum model for a  $C_2$ -equivariant analogue of integral Brown-Gitler spectra precise. Nonequivariantly, integral Brown-Gitler spectra have many computational uses, including splitting of  $bo \wedge bo$ . The  $C_2$ -equivariant spectra we construct share many analogous properties to the nonequivariant integral Brown-Gitler spectra and thus should be useful for producing similar splittings in the  $C_2$ -equivariant setting. Our main motivation is to use these  $C_2$ -equivariant Thom Spectra spectra to produce a  $C_2$ -equivariant spectrum-level splitting of the  $BP_{\mathbb{R}}\langle n \rangle$ -cooperations algebra at heights zero and one.

This is ongoing joint work with Guchuan Li and Elizabeth Tatum.

20:45 **Elizabeth Tatum** (Stockholm University):  *$BP\langle 2 \rangle$ -Cooperations and Brown-Gitler Spectra.*

In the 1980's, Lellman and Mahowald used Brown-Gitler spectra to construct spectrum-level splittings of the  $bo$  and  $BP\langle 1 \rangle$ -cooperations algebras. These splittings helped make it feasible to do computations using the  $bo$  and  $BP\langle 1 \rangle$ -Adams spectral sequences. In this talk, we will discuss an analogous splitting for the  $BP\langle 2 \rangle$ -cooperations algebra.

21:00 **Francesca Pratali** (Université Sorbonne Paris Nord): *Linear  $\infty$ -operads.*

There exist different models of the notion of  $\infty$ -operads, notably Lurie's model, developed starting from the theory of (co)cartesian fibrations of  $\infty$ -categories (meant as quasicategories), and, on the other hand, dendroidal  $\infty$ -operads. These can be defined as certain contravariant functors from a category of trees to spaces satisfying a generalization of the Segal property, as well as the completeness condition. Following Hoffbeck and Moerdijk, I am working with the extension of this definition to that of linear  $\infty$ -operads, namely operads enriched in the category of chain complexes over a ring  $R$ . The aim is to see how and to what extent they can fit the established theory of enriched  $\infty$ -operads of, for example, Haugseng and Chu.

21:15 **Victor Saunier** (Université Sorbonne Paris Nord): *The categorified Dundas-Goodwillie-McCarthy theorem.*

Building on Yonatan Harpaz's talk, we will explain how the universal properties of  $THH$  and  $K$ -theory of square-zero extensions defined on the tangent bundle of  $\text{Cat}^{\text{Ex}}$  can be compared and how to deduce from it a categorified version of the Dundas-Goodwillie-McCarthy theorem, using standard tools of Goodwillie calculus.

This is part of joint work with Yonatan Harpaz and Thomas Nikolaus.

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21:30 **Antoine Feltz** (Université de Strasbourg): *Polynomial functors over the categories  $FI_d$  of colored injections.*

There exist some generalizations of the category FI of finite sets and injections, denoted  $FI_d$ , where we add a choice of colours among  $d$  possible on the complement of the image of each injection. As the categories  $FI_d$  do not have initial object anymore for  $d > 1$ , they come out of the framework of Djament and Vespa. In this talk we will present different notions of polynomial functors over the categories  $FI_d$ , and we will illustrate how they turn out to be harder to study than on FI.

21:45 **Julia Semikina** (Universität Münster): *Cut-and-paste invariants of manifolds via  $K$ -theory.*

I will show an application of the construction of Campbell and Zakharevich that will allow us to speak about the " $K$ -theory of manifolds" spectrum. The  $K_0$  of the constructed spectrum recovers the classical  $SK$ -groups introduced by Kreck, Karras, Neumann and Ossa. I will explain how to relate the spectrum to the algebraic  $K$ -theory of integers, and how this leads to certain classical invariants of manifolds when restricted to the lower homotopy groups.

22:00 **Miguel Barrero** (Radboud University): *Title Global transfer systems.*

Global transfer systems parametrize different levels of commutativity in globally equivariant homotopy theory. I have classified them for abelian compact Lie groups, but the non-abelian case appears to be a more complicated group theory problem.

22:15 **Hugo Pourcelot** (Université Sorbonne Paris Nord): *Brane action and string topology.*

The brane action associates to any coherent infinity-operad  $P$  a kind of universal  $P$ -algebra. I will review this construction along the lines of my thesis results and explain how this yields new operations in string topology.