Derived Algebraic Geometry in Taipei

March 19-20, 2025 Talk Abstract

Grigory Andreychev (IAS) Invertingv₁onZ^s_pyn

In joint work in progress with Maximilian Hauck and Tasos Moulinos, we study the étale realization functor from prismatic F-gauges to Galois representations and analyze the stack for which the latter is the associated category of quasi-coherent sheaves.

Emile Bouaziz (Academia Sinica) *Elliptic Objects and DAG*

I'll discuss joint work with Adeel Khan in which we an elliptic version of the algebrogeometric space of free loops in a stack. As an illustration we produce a rather flexible theory of equivariant elliptic Hodge cohomology. Time permitting I will sketch a definition of elliptic (and quantum) vertex algebras suggested by the above picture coupled with work of Joyce. This latter is joint work in progress with Arkadij Bojko.

Chris Brav (SIMIS)

Beilinson-Parshin adeles via solid algebraic geometry

We give an introduction to solid algebraic geometry, in the sense of Clausen-Scholze, a refinement of classical algebraic geometry built on spectra of solid rings, a certain category of "topological" rings including classical adic-like topological algebras. We show that the additional locality afforded by working with a larger collection of test spectra leads to a new construction of adelic decompositions of quasi-coherent sheaves, in the form of Beilinson-Parshin, as well as a very general adelic descent result. This is joint work Grigory Konovalov.

Andy Jiang (Academia Sinica)

Grothendieck Duality and Reduction Formulae

I will try to give a somewhat modern interpretation of reduction formulae due to Avramov-Iyengar-Lipman-Nayak, following work of Neeman and Khusyairi.

Dmitry Kubrak (IHES)

Atiyah-Segal completion-type theorems in algebraic geometry

I will talk about my recent work with E.Elmanto and V.Sosnilo where we establish some algebraic geometric analogs of Atiyah-Segal completion theorems for algebraic K-theory. More precisely, for a derived algebraic space X with an action of reductive group G we show that the right Kan extension of K-theory from schemes to stacks evaluated on the quotient

stack [X/G] is given by an explicit completion of K(Perf([X/G])), provided the stabilizers are nice group schemes. If time permits I will also explain why in the singular case the nice condition on the stabilizers seems to be necessary, and share some ideas concerning characteristic p (or mixed characteristic) generalizations.

Tasos Moulinos (CNRS)

Unipotent spectra and Artin-Mazur formal groups

In this talk I will introduce the notion of a unipotent spectrum. This is a stabilized variant of Toën's theory of affine stacks. I will describe some properties inherited by this stable infinity category of "unipotent spectra" and give various examples of such objects. I will moreover describe how working in this stable setting gives rise to a construction of a "unipotent homology" for schemes. Out of this unipotent homology type, we are able to recover the formal groups originally defined by Artin and Mazur. Finally, due to the vanishing of higher ext groups, the theory simplifies further upon restricting to sites of perfect schemes and one obtains a duality in the spirit of Milne's duality for perfect unipotent groups; time permitting I will describe what happens in this setting. This is joint work with Shubhodip Mondal and Lucy Yang.