

ALGEBRAIC GEOMETRY PARALLEL SESSION 2022: ABSTRACTS

Oren Ben-Bassat, University of Haifa

Title: **Beyond Flatness**

I will start by sketching a (higher) categorical approach to different types of geometry. After that, I will explain how using this approach (derived) analytic geometry can be viewed in a precise way as a type of algebraic geometry. I will explain and use in a fundamental way Banach rings and categories of Banach modules over a Banach ring. The theories of derived analytic geometry from this perspective include both archimedean and non-archimedean analytic theories. I will give an analytic and an arithmetic example of lack of flatness. I will give examples of homotopy epimorphisms between algebras of analytic nature. I will include examples and relevance in the rigid analytic context and an arithmetic context. I will discuss descent theorems and time permitting, other topics such as blow-ups. Joint work with Kremnizer, Kelly and Hekking.

Shai Haran, Technion

Title: **Non additive geometry and Frobenius correspondences**

The usual language of algebraic geometry is not appropriate for Arithmetical geometry: addition is singular at the real prime. We developed two languages that overcome this problem: one replace rings by the collection of “vectors” or by bi-operads and another based on “matrices” or props. Once one understands the delicate commutativity condition one can proceed following Grothendieck footsteps exactly. The props, when viewed up to conjugation, give us new commutative rings with Frobenius endomorphisms.

Dmitry Kerner, BGU

Title: **Determinacy, unfoldings and stable maps in arbitrary characteristic.**

In the 40's, Whitney studied maps of C^∞ manifolds. When a map is not an immersion/submersion, one tries to deform it locally, in hope to make it ‘generic’. This approach has lead to the rich theory of stable maps, developed by Mather, Thom and many others.

The main ‘engine’ was vector field integration. This chained the whole theory to the C^∞ , or \mathbb{R}/\mathbb{C} -analytic setting.

I will present the purely algebraic approach, studying maps of germs of Noetherian schemes, in any characteristic. The relevant groups of equivalence admit ‘good’ tangent spaces. Submodules of the tangent spaces lead to submodules of the group orbits. Then goes the theory of unfoldings (triviality and versality). Time permitting I will discuss the new results on stable maps.

Zev Rosengarten, HUJI

Title: **Rigidity And Unirational Groups**

We discuss some recent results and conjectures regarding the structure of unirational algebraic groups over imperfect fields, especially in the most difficult unipotent case. A central role is played by a certain rigidity principle for maps from rational varieties into wound unipotent groups, which has very strong implications for the behavior of unirational groups.