

Mini workshop on derived categories and related topics

Date : 24 February 2020 (Mon)

Venue : Nambu Hall, Graduate School of Science, Osaka University

Schedule

- 10:00 – 11:00 Shinder
- 11:30 – 12:30 Ouchi
- 14:00 – 15:00 Watanabe
- 15:30 – 16:30 Hirano

Titles and Abstracts

- **Evgeny Shinder** (The University of Sheffield)

Semiorthogonal decompositions for singular varieties

I will define the Kawamata semiorthogonal decomposition for derived categories of singular projective varieties, generalizing the concept of an exceptional collection in the smooth case. I will present known constructions of these for nodal curves (Burban), torsion-free toric surfaces (Karmazyn-Kuznetsov-Shinder) and two nodal threefolds (Kawamata). I will also explain obstructions coming from the K_{-1} group, and how it translates to maximal nonfactoriality in the nodal threefold case. This is joint work with M.Kalck and N.Pavic.

- **Genki Ouchi** (Riken)

Derived categories of K3 surfaces, abelian surfaces and symplectic resolutions

In this talk, I would like to talk about some relations between derived categories of K3 surfaces and abelian surfaces via finite group actions. We use such relations to construct symplectic resolutions of certain quotients of moduli spaces of stable objects on K3 surfaces.

- **Tomonobu Watanabe** (Tokyo Metropolitan University)

L-equivalence of complex abelian varieties

L-equivalence has been studied in recent years since it is expected to be closely related to derived equivalence and rationality problem. Efimov and Ito—Miura—Okawa—Ueda showed independently that two L-equivalent complex abelian varieties are isomorphic if one side of the endomorphism rings of those abelian varieties is isomorphic to the ring of integers. This result is a conclusion of arguments of the cancellation problem for objects of an additive category. In this talk, I will reconsider the cancellation problem and explain how this implies further results about L-equivalent abelian varieties.

- **Yuki Hirano** (Kyoto University)

Full strong exceptional collections for invertible polynomials of chain type

We first prove semi-orthogonal decompositions of the homotopy categories of maximally graded matrix factorizations of invertible polynomials of chain type. Using this semi-orthogonal decomposition, we show that the homotopy category of maximally graded matrix factorizations of an invertible polynomial of chain type admits a full strong exceptional collection. This is a joint work with Genki Ouchi.

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Organizers: Shinnosuke Okawa and Atsushi Takahashi