Workshop on
Floer theory, categorical dynamics and related topics[1]

We announce the following workshop held at Nagoya University. If there are any changes, we will inform you on the web page:

http://www.math.nagoya-u.ac.jp/ja/research/calendar/

Organizer: Hiroshi Ohta, Genki Ouchi

Date: 18 July–19 July 2023

Venue: Nagoya University, Science Bldg A-358(18 July), A-428(19 July) in the map

http://www.math.nagoya-u.ac.jp/en/direction/nagoya.html

Program:

18 July

10:00 –11:30   Jongmyeong Kim (IBS Center for Geometry and Physics)

Categorical entropy, (co-)t-structures and ST-triples

13:00 –14:30   Jongmyeong Kim (IBS Center for Geometry and Physics)

Calabi-Yau structures on Rabinowitz Fukaya categories

15:00 –   discussion

19 July

10:00 –11:00   Genki Ouchi (Nagoya)

Stability conditions on K3 surfaces and mass of spherical objects

11:30 –12:30   Shunsuke Kano (Tohoku)

Categorical dynamical systems arising from pseudo-Anosov mapping classes of marked surfaces

13:45 –14:45   Kohei Kikuta (Osaka)

Acylindrically hyperbolicity for automorphism groups of K3 surfaces

15:00 –   discussion

Abstract:

(Kim 1) In this talk, we study a dynamical property of an exact endofunctor F of a triangulated category D using the notion of categorical entropy introduced by Dimitrov-Haiden-Katzarkov-Kontsevich. In particular, we consider the following question: Given full triangulated subcategories A and B of D such that F restricts to A and B, how the categorical entropies of the restricted functors are related? In this talk, we will answer this question for the case where A and B form an ST-triple in which case A has a bounded t-structure and B has a bounded co-t-structure which are, in some sense, dual to each other.

(Kim 2) In this talk, we study a variant of Lagrangian Floer cohomology called Rabinowitz Floer cohomology. In particular, we will see that Rabinowitz Floer cohomology has a Calabi-Yau structure. We will also see how this can be thought of as an analogue of the Poincaré-Lefschetz duality. This is a joint work progress with Hanwool Bae and Wonbo Jeong.

(Ouchi) Huybrechts proved that a stability condition on a K3 surface is determined by the stability of spherical objects. Motivated by the study of the Thurston compactification of spaces of stability conditions expected by Bapat, Deopurlar and Licata, I would like to show that a stability condition on a K3 surface is determined by the mass of spherical objects. This talk is based on the joint work with Kohei Kikuta and Naoki Koseki.

(Kano) We give an autoequivalence of the derived category of the Ginzburg dg algebra for a sign-stable mutation loop, which is a cluster algebraic generalization of pseudo-Anosov mapping classes. We compute the categorical entropies of their restrictions to some subcategories and conclude that they are both given by the logarithm of the cluster stretch factor. If time permits, we discuss the pseudo-Anosovness of them in the sense of Fan–Filip–Haiden–Katzarkov–Liu.

(Kikuta) Geometric group theory provided an effective way to study groups. Automorphism groups Aut(X) of K3 surfaces X have been classically studied, but there are very few geometric group theoretic study. Kurnosov-Yasinsky showed that Aut(X) is a CAT(0) group in 2019. In this talk, based on their result, we see that a more detailed alternative holds: Aut(X) is either virtually abelian or acylindrically hyperbolic.