

校庆 118 周年暨第 57 届科学报告讨论会

Time: Thursday, May 25th, 14:00-16:35

Venue: SCMS 102

Chair: Weixiao Shen (沈维孝)

Lecture 1 14:00-14:45 **Speaker:** Xiaolei Wu(伍晓磊)

Title: On the homology of big mapping class groups

Abstract: I will start slowly with basic notions on homology of groups. Then I will give a review on the calculations of homology of mapping class groups for finite type surfaces. After that I will discuss what is the story in the case of infinite type surfaces. In particular, I will discuss how one can calculate the homology of mapping class groups for some well-know surfaces, including disk minus Cantor set. This is based on joint works with Martin Palmer.

Lecture 2 14:45-15:30 **Speaker:** Kai Du (杜恺)

Title: Some recent results on mean-field models

Abstract: Mean-field models are commonly used in the study of statistical physics and complex networks. The key idea, called the propagation of chaos, is that in a weakly interacting particle system the particles are asymptotically independent as the system size grows. This talk introduces some recent results, which reveal that the propagation of chaos phenomenon also emerges in a range of particle systems beyond weakly



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interaction. Moreover, the mean-field model has an intimate link to the self-interacting diffusion.

Tea Break 15:30-15:50

Lecture 3 15:50-16:35 Speaker: Yang Zhou (周杨)

Title: The structure behind counting curves

Abstract: This is an expository talk on the striking structure of the answers to counting problems. In this talk we consider the classical problem of counting branched covers of a torus $S^1 \times S^1$. This is the simplest example of higher genus Gromov-Witten invariants of a Calabi-Yau manifold. We will show that the generating series are quasi-modular forms and can be computed by a summation over trivalent Feynman graphs. We will mainly follow a beautiful expository article by Dijkgraaf.