

Date: 2020.9.17. 9:00-10:00 (Beijing time).

Tencent meeting: 606 1859 8357

Zoom: 622 345 26185 (psw123456)

Speaker: Qiang Zeng (University of Macau)

Title:

Complexity of high dimensional Gaussian random fields with isotropic increments

Abstract:

The number of critical points of a random function is a basic question and is commonly called complexity. The notion of locally isotropic random fields (a.k.a. random fields with isotropic increments) was introduced by Kolmogorov in the 1940s. Gaussian random fields on  $N$ -dimensional Euclidean spaces with isotropic increments were classified as isotropic case and non-isotropic case by Yaglom in the 1950s. Such models were introduced to model a single particle in a random potential in physics of disordered system by Engel, Mezard and Parisi in early 1990s. In 2004, Fyodorov computed the large  $N$  limit (on the exponential scale) of expected number of critical points for isotropic Gaussian random fields. However, many natural models are not isotropic and only have isotropic increments, which creates new difficulty in understanding the complexity. In this talk, I will present some results on the large  $N$  behavior of complexity of non-isotropic Gaussian random fields with isotropic increments. Connection to random matrices and large deviations will be explained.

This talk is based on joint work with Antonio Auffinger (Northwestern University).