

北京师范大学 随机数学研究中心

学术报告-系列短课

报告人: 顾陈琳 (清华大学)

题目: **Random Walks and Homogenization Theory**

时间: 2023 年 11 月 6 日, 13 日, 20 日, 27 日, 周一下午 2: 00-5: 00

地点: 后主楼 1124

摘要: The central-limit type results are universal in many random walk models: they are known as Donsker's theorem for the classical Z^d random walk, and also hold for some random walks in random environment, even when the environment is degenerate like percolation. In their proofs, the homogenization theory, which comes from PDE, plays an important role. This mini-course will cover the following contents:

- Lecture 1: Introduction
- Lecture 2: Invariance principle of random conductance model
- Lecture 3: Periodic homogenization
- Lecture 4: Stochastic homogenization

Prerequisite: Basic probability and PDE

References:

1. Armstrong, S., Kuusi, T. and Mourrat, J.C., 2019. Quantitative stochastic homogenization and large-scale regularity (Vol. 352). Springer.
2. Biskup, M., 2011. Recent progress on the random conductance model. Probability Surveys, 8, pp.294-373.
3. Dario, P. and Gu, C., 2021. Quantitative homogenization of the parabolic and elliptic Green's functions on percolation clusters. The Annals of Probability, 49(2), pp.556-636.
4. Jikov, V.V., Kozlov, S.M. and Oleinik, O.A., 2012. Homogenization of differential operators and integral functionals. Springer Science & Business Media.
5. Lawler, G.F. and Limic, V., 2010. Random walk: a modern introduction (Vol. 123). Cambridge University Press.