Fall 2025

Geometry and Topology Seminar

Title

Asymptotics of shortest filling closed geodesics

Speaker:	Yue Gao, Anhui Normal University
Date:	October 28, 2025
Time:	10:30AM (China Standard Time)
Tencent Meeting (VooV):	382 868 2051, Password: 202510

Abstract: We investigate the asymptotics of shortest filling closed multi-geodesics of closed hyperbolic surfaces as systole $\to 0$ or as genus $\to \infty$. We first show that for a closed hyperbolic surface X_g of genus g, the length of a shortest filling closed multi-geodesic of X_g is uniformly comparable to

$$\left(g + \sum_{\text{closed geodesic } \gamma \subset X_g, \ \ell(\gamma) < 1} \log\left(\frac{1}{\ell(\gamma)}\right) \right).$$

As an application, we show that as $g \to \infty$, a Weil-Petersson random hyperbolic surface has a shortest closed multi-geodesic of length uniformly comparable to g. We also show that this is true for a random hyperbolic surface in the Brooks-Makover model. This is a joint work with Yunhui Wu and Zhongzi Wang.