



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PhD Student Seminar

**Selberg trace formula on regular graph**

By

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**Abstract**

The Selberg trace formula relates the eigenvalue of the Laplace operator to the length of closed geodesics on a compact surface. A version of this formula for finite regular graphs is interesting since the eigenvalue of the Laplacian for a given graph can be calculated explicitly, the trace formula lets one find the numbers of closed geodesics of any length. Here the graph version is reviewed. A trace quantity is rewritten as a sum over closed paths. All the closed paths are divided into classes of homotopically equivalent paths, including a class of contractible paths and one homotopy class for each closed geodesic. The trace formula then is sum of contribution of contractible paths and the nontrivial geodesics.

**Date : 9 May 2023 (Tuesday)**

**Time : 4:00 pm**

**Venue : Room 3472 (Lifts 25/26)**

*All are Welcome!*