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# Joint Geometric Analysis Seminar

(Part of MIST program)

*Optimization of Laplace and Steklov eigenvalues  
with applications to minimal surfaces*

*Dr. Mikhail Karpukhin  
California Institute of Technology*

## Abstract

The study of optimal upper bounds for Laplace eigenvalues on closed surfaces is a classical problem of spectral geometry going back to J. Hersch, P. Li and S.-T. Yau. Its most fascinating feature is the connection to the theory of minimal surfaces in spheres. Optimization of Steklov eigenvalues is an analogous problem on surfaces with boundary. It was popularised by A. Fraser and R. Schoen, who discovered its connection to the theory of free boundary surfaces in Euclidean balls. Despite many widely-known empiric parallels, an explicit link between the two problems was discovered only in the last two years. In the present talk, we will show how Laplace eigenvalues can be recovered as certain limits of Steklov eigenvalues and discuss the applications of this construction to the geometry of minimal surfaces. The talk is based on joint works with D. Stern.

Date: 23 February 2022 (Wednesday)

Time: 10:00am – 11:00am (Hong Kong time)

ZOOM link: <https://cuhk.zoom.us/j/91805734715>*All are Welcome*