



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PDE

**Stability for Faber-Krahn inequalities and
the ACF formula**

By

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Abstract

The Faber-Krahn inequality states that the first Dirichlet eigenvalue of the Laplacian on a domain is greater than or equal to that of a ball of the same volume (and if equality holds, then the domain is a translate of a ball). Similar inequalities are available on other manifolds where balls minimize perimeter over sets of a given volume. I will present a new sharp stability theorem for such inequalities: if the eigenvalue of a set is close to a ball, then the first eigenfunction of that set must be close to the first eigenfunction of a ball, with the closeness quantified in an optimal way. I will also explain an application of this to the behavior of the Alt-Caffarelli-Friedman monotonicity formula, which has implications for free boundary problems with multiple phases. This is based on recent joint work with Mark Allen and Robin Neumayer.

Date : 29 October 2021 (Friday)

Time : 9:00am

Zoom Meeting : <https://hkust.zoom.us/j/93734229393> (Passcode: 936334)

All are Welcome!