The Hong Kong University of Science and Technology

Department of Mathematics

<u>Mathematics Colloquium</u>

Spectral Optimization and Free Boundary Problems

By

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<u>Abstract</u>

A classic subject in analysis is the relationship between the spectrum of the Laplacian on a domain and that domain's geometry. One approach to understanding this relationship is to study domains which extremize some function of their spectrum under geometric constraints. I will explain how to attack these problems using tools from the calculus of variations to find solutions. A key difficulty with this method is showing that the optimizers (which are a priori very weak) are actually smooth domains, and I address this issue in some recent work with Fanghua Lin. Our results are based on relating spectral optimization problems to certain vector-valued free boundary problems of Bernoulli type.

Date: *Tuesday, 6 February 2018*

Time: *2:30 p.m. – 3:30 p.m.*

Venue: *Room 5566, Academic Building (near Lifts 27&28), HKUST*

All are welcome!

The speaker is a candidate for a faculty position