THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Wave propagation near geometric singularities

By

Prof. Sanghyeon Yu
Korea University

Abstract

Concentrating light at the nanoscale is one of the greatest challenge in optics. If conventional optical devices are used, one cannot focus light into a spot smaller than a few hundred of nanometers due to the diffraction limit. Nano-optics overcomes this fundamental difficulty using various optical nanostructures having `geometrical singularities' on their surfaces. Light can be strongly localized near the geometric singularity point and it is of high importance to understand this singular phenomenon quantitatively for nano-optics applications. Its mathematical analysis requires to solve the PDE spectral problem for an elliptic operator where two key assumptions break down: uniform ellipticity and boundary smoothness, resulting in the singular behavior of solutions. It In this talk, we discuss how to characterize the singularity of solutions to the spectral PDE towards a mathematical theory of nano-optics.

Date   : **15 September 2025 (Monday)**
Time   : **3:00p.m.-4:00p.m.**
Venue : **Room 1103 (Lift 19)**

All are Welcome!