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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Approximate eigenfunctions for some aperiodic crystals

By

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Abstract

The electronic structure of aperiodic crystals poses a major challenge in quantum condensed matter physics. In this talk, I will present a rigorous mathematical framework to address this problem. Under explicit and easily verified assumptions, we derive sufficient conditions for the emergence of localized approximate eigenfunctions in aperiodic systems. Moreover, we establish a direct connection between these approximate eigenfunctions and their effective Hamiltonian counterparts, and we observe some new terms never explained in physics. Finally, I will illustrate our findings with applications to the Landau–Schrödinger, Landau–Dirac, and quantum harmonic oscillator effective Hamiltonians.

*** Date : 9 December 2026 (Wednesday)**
Time : 3:00p.m.-4:00p.m.
Venue : Room 5566 (near Lift 27/28)

All are Welcome!