THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Numerical Analysis Seminar

Conically degenerate spectral points of the periodic Schrödinger operator

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Abstract

Conical spectral points on the dispersion bands are the origin of many novel topological phenomena including various topological phases. I will first review recent mathematical theories on these points, especially Fefferman & Weinstein's results (JAMS 2012) on 2D Dirac points which paved the way for rigorous justifications of such points. Then I will focus on our recent progress in constructing 3-fold Weyl points at which two energy bands intersect conically with an extra band sandwiched in between. We give the existence of such points in the spectrum of the 3-dimensional Schrödinger operator $H = -\Delta + V(x)$ with $V(x)$ being in a large class of periodic potentials. This is the first rigorous result on the existence of 3-fold Weyl points for a broad family of 3D continuous Schrödinger equations. Our result extends Fefferman-Weinstein's pioneering work to a higher dimension and higher multiplicities. This talk is based on the joint work with H. Guo and M. Zhang at Tsinghua university.

Date:	November 2, 2022 (Wednesday)
Time:	10:00 – 11:00am
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 913 6532 3891 Password: 310656

All are welcome