THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PURE MATHEMATICS

Topologically protected boundary spectra

by

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Abstract

I will provide analytic background underlying the use of modern topology to discuss phases of matter in physics (Nobel Prize 2016). A "topological" insulator paradoxically turns into a "topological metal" at its boundary, and this defining feature survives a large variety of perturbations. Mathematically, one encounters twisted Schrodinger operators, and discovers that certain spectra are "topologically-protected", via index theory. The example of quantum Hall systems (Nobel 1985), on general manifolds, will be discussed.

Biography
Prof. Thiang obtained his DPhil in Mathematics from University of Oxford in 2014. He was a Post-doctoral Research Research Associate from 2015-2017 at University of Adelaide, Australia. He was then appointed as an Australian Research Council DECRA Fellow from 2017-2020. He joined Beijing International Center for Mathematical Research in 2020 as an assistant professor. Prof. Thiang's research interests includes K-theory, operator algebras, algebraic topology, noncommutative geometry, and index theory, as applied to mathematical physics problems arising in: topological phases of matter, mathematical dualities in condensed matter physics and string theory, geometric analysis and index theory for Bulk-Boundary Correspondences. He have also worked on the mathematics of quantization and quantum field theory, quantum information theory, convex optimization techniques, and foundations of quantum mechanics.

Date : **5 January 2022 (Wednesday)**

Time : **11:30am – 12:30pm**

Venue : **Room 5508 (Lifts 25/26)**

All are Welcome!