

IAS FOCUSED PROGRAM

Young Research Leaders in
Topological Materials and Beyond' 24

June 17-21, 2024

Venue: IAS2042, 2/F, Lo Ka Chung Building, Lee Shau Kee Campus, HKUST

June 16, 2024 (Sun) |

Time	Event
18:00 – 20:00	Registration and Welcoming Reception (By Invitation)

Time	Event
Session M-01: Recent Developments in Moiré Superlattices I	
09:00 – 09:05	Opening Remarks
09:05 – 09:40	Chern Insulators and Anomalous Hall Crystals from Parent Berry Curvature <i>Trithep DEVAKUL (Stanford University)</i>
09:40 – 10:15	Molecular Pairing in Twisted Bilayer Graphene Superconductivity <i>Zhi-Da SONG (Peking University)</i>
10:15 – 10:50	Interactions, Topology and Quantum Criticality in Moiré Transition Metal Dichalcogenide Materials <i>Debanjan CHOWDHURY (Cornell University)</i>
10:50 – 11:20	Coffee Break
11:20 – 11:55	Imaging Many-Body Phases in Magic-Angle Graphene <i>Kevin NUCKOLLS (Massachusetts Institute of Technology)</i>
11:55 – 12:30	Imaging Electric Potential within Moiré Superlattices Using the Atomic SET <i>Dahlia KLEIN (Weizmann Institute of Science)</i>
12:30 – 14:00	Lunch (By Invitation)
Session M-02: New Developments in Topological Quantum Materials I	
14:00 – 14:35	Topological Quantum Chemistry and Single Particle Greens' Function for Correlated Topological Materials <i>Maia VERGNIORY (Max Planck Institute for Chemical Physics of Solids)</i>
14:35 – 15:10	Spin- and Orbital-poles in Chiral Topological Semimetals <i>Niels SCHRÖTER (Max Planck Institute of Microstructure Physics)</i>
15:10 – 15:50	Coffee Break
15:50 – 16:25	Epitaxial Square Net Intermetallics; New Structures and Enhanced Superconductivity <i>Joseph FALSON (California Institute of Technology)</i>
16:25 – 17:00	Unraveling Z₄ Invariants in Topological Materials with Spin-Resolved Topology in Insulators and Dual Charge-Resolved Topology in Superconductors <i>Benjamin WIEDER (Université Paris-Saclay)</i>

Time	Event
Session Tu-01: New Developments in Topological Quantum Materials II	
09:00 – 09:35	Bridging Topological Band Theory and Molecular Chemistry: A Novel Approach to Understanding Reaction Dynamics <i>Lukas MUECHLER (The Pennsylvania State University)</i>
09:35 – 10:10	Topological and Excitonic States in Ta₂Pd₃Te₅ <i>Zhijun WANG (Chinese Academy of Sciences)</i>
10:10 – 10:45	Topological Surface Van Hove Singularity and Charge-Density-Wave Enhanced Excitons in metallic TbNiC₂' <i>Junzhang MA (City University of Hong Kong)</i>
10:45 – 11:15	Coffee Break
11:15 – 11:50	Conjoined Charge Density Waves in Correlated Topological Quantum Materials <i>Haoxiang LI (HKUST (GZ))</i>
11:50 – 12:25	The Topology and Chirality for Phonons <i>Tiantian ZHANG (Chinese Academy of Sciences)</i>
12:30 – 14:00	Lunch (By Invitation)
Session Tu-02: Plenary Discussion - Conceptual Frontier in Topological / Correlated Quantum Materials	
14:00	Opening remarks and Chairing <i>Julia Chan (Science Advances)</i>
15:10 – 15:40	Coffee Break

Time	Event
Session W-01: Topological and Quantum Magnetism	
09:00 – 09:35	Emergent Electrodynamics in Centrosymmetric Materials and in van-der-Waals Magnets <i>Max HIRSCHBERGER (University of Tokyo)</i>
09:35 – 10:10	Using Anisotropic Strain to Probe Multipolar Order Parameters <i>Linda YE (California Institute of Technology)</i>
10:10 – 10:45	Flat Bands in Bulk Quantum Materials <i>Ming YI (Rice University)</i>
10:45 – 11:20	Coffee Break & Group Photo Taking
11:20 – 11:55	Synthesis and Search of New Topological Magnetic Textures (Beyond the classical ones) <i>Takashi KURUMAJI (California Institute of Technology)</i>
11:55 – 12:30	Ultrafast Spin Dynamics in Magnetic Topological Materials <i>Luyi YANG (Tsinghua University)</i>
12:30 – 14:00	Lunch (By Invitation)
14:00 – 17:30	Excursion (By Invitation)
18:00	Banquet (By Invitation)

Time	Event
Session Th-01: Recent Developments in Moiré Superlattices II	
09:00 – 09:35	Strong Interactions and Isospin Symmetry Breaking in a Supermoiré Lattice <i>Yonglong XIE (Rice University)</i>
09:35 – 10:10	Generalized Anomalous Hall Crystals in a Graphene Moiré Lattice <i>Matthew YANKOWITZ (University of Washington)</i>
10:10 – 10:45	Edge Transport Theory of Chiral Topological Systems <i>Biao LIAN (Princeton University)</i>
10:45 – 11:20	Coffee Break
11:20 – 11:55	Bootstrapping the Quantum Hall Problem <i>Eslam KHALAF (Harvard University)</i>
11:55 – 12:30	Composite Fermions and the Fractional Quantum Anomalous Hall Effect <i>Hart GOLDMAN (Massachusetts Institute of Technology)</i>
12:30 – 14:00	Lunch (By Invitation)
Session Th-02: Plenary Discussion - Material Trends in QM to Address the Open Physical Questions	
14:00	Opening remarks and Chairing <i>Jakub Jadwyszczak (Nature Communications)</i>
15:10–15:30	Coffee Break

Time	Event
Session Fr-01: Quantum Transport in Topological Materials	
09:00 – 09:35	Encapsulated Chemistry and Quantum Engineering of Superconductivity in 2D Topological Chalcogenides <i>Sanfeng WU (Princeton University)</i>
09:35 – 10:10	Amorphous Topological Metals <i>Adolfo GRUSHIN (Institut Néel, Grenoble)</i>
10:10 – 10:45	Integer and Fractional Quantum Anomalous Hall Effects in 2D Semiconductor Moiré Superlattices <i>Tingxin LI (Shanghai Jiaotong University)</i>
10:45 – 11:20	Coffee Break
11:00 – 11:40	Anomalous Quasiparticle Motion from Quantum Geometry <i>Tobias HOLDER (Tel Aviv University)</i>
11:40 – 12:20	Probing Moiré Quantum Materials Using THz Excitation <i>Denis BANDURIN (National University of Singapore)</i>
12:20 – 12:30	Closing Remarks
12:30 – 14:00	Lunch (By Invitation)