GORDON AND BETTY MOORE FOUNDATION

CIFAR

CIFAR Quantum Materials

Summer School 2018
May 28-30

Welcome

It is our pleasure to welcome you to the 2018 edition of the CIFAR Quantum Materials Summer School in Montreal. The school will consist of three days of lectures and a poster session before the CIFAR main meeting. We hope this platform offers you the opportunity to learn something new, present your work, think about possible future career paths, and to make new connections and friends.

We are grateful to our speakers and to CIFAR for making this summer school possible.

—The organizing committee

Informations

The summer school and main meeting will take place at the Delta Hotel by Marriott, 475 President-Kennedy Avenue, Montreal.

Important dates for the summer school

May 27: Arrivals (Hotel check-in begins at 4 pm)
May 28: Social Event at Blumenthal (305 Rue Ste-Catherine O). In order to access the event, you must have your name badge on. Food will be served.
May 28-29-30: All day meeting
May 30 : Reception in the Foyer with the program member

Important dates for the main meeting

May 30: Welcome reception
May 31: Group dinner
May 30 - June 2: All day meeting

Schedule

Monday, May 28

07:00—10:00	**Breakfast and registration**
10:00—11:00	Simon Verret — *A visual introduction to Green's functions, superconductivity and density waves*
11:00—11:30	**Coffee break**
11:30—12:30	Glen Evenbly - *Tensor networks and applications*
12:30—13:30	**Lunch**
13:30—14:30	Laura-Isabelle Dion-Bertrand - *Careers opportunities in Physics*
14:40—17:30	Posters
17:30—18:30	**Free Time**
18:30—20:30	**Social Activity (*Blumental*)**

Tuesday, May 29

07:00—09:00	**Breakfast**
09:00—10:00	Eun-Ah Kim - *Applications of AI for quantum condensed matter physics*
10:00—10:10	**Small break**
10:10—11:10	Eun-Ah Kim - *Part 2*
11:10—11:30	**Coffee break**
11:30—12:30	Elia Razzoli - *New approaches in Time- and Spin-resolved ARPES*
12:30—13:30	**Lunch**
13:30—14:30	Jenny Hoffman - *STM of superconductivity*
14:30—15:00	**Coffee break**
15:00—16:00	Jenny Hoffman - *STM of strongly correlated topological material (SmB_6)*
16:00—18:00	**Free Time**
18:00 —	**Self-organized dinner**

Schedule

Wednesday, May 30

Breakfast	07:00—09:00
Alannah Hallas - *Introduction to experimental aspects of frustrated magnetism*	09:00—10:00
Small Break	10:00 — 10:10
Stephen Hayden- *Measuring Magnetic Excitations with Neutrons*	10:10 — 11:10
Coffee Break	11:10 — 11:30
Liang Fu - *Electronic structure of twisted bilayer graphene*	11:30 — 12:30
Lunch	12:30 — 13:30
Cyril Proust - *Recent result on linear resistivity in cuprates*	13:30 — 14:30
Coffee Break	14:30 — 15:00
Joseph Maciejko - Interacting Topological Materials	15:00 — 16:00
Free time	16:00 — 19:00
Joint Reception for QM Program Members & Summer School Students	19:00 — 21:00

Thursday, May 31

Breakfast	07:00 — 08:15
Eun-Ah Kim - Learning quantum emergence with AI	08:30 — 09:15
Roger Melko - Machine learning the quantum wavefunction…	09:15 — 10:00
Coffee Break	10:00 — 11:00
Satoru Nakatsuji - Novel functional magnets based on multipoles …	11:00 — 11:45
Stephen Hayden - SDW order and magnetic excitations in $Sr_3Ru_2O_7$	11:45 — 12:30
Lunch	12:30 — 14:30
Leslie Schoop - Chemistry and topological semimetals	14:30 — 15:15
Andy Millis - CCQ and CIFAR-QM: how might we work together ?	15:15 — 15:30
Poster Ads, Poster session and coffee Break	15:30 — 19:00
Group Dinner	19:00 —

Schedule

Friday, June 1

07:00 — 08:15	**Breakfast**
08:30 — 09:15	Pablo Jarillo-Herrero — *Magic angle graphene superlattices : A new platform for strongly correlated physics*
09:15 — 10:00	Liang Fu — *A model for metal-insulator transition in twisted bilayer graphene and beyond*
10:00 — 11:00	**Coffee break**
11:00 — 11:30	Josh Folk— *Superconductivity in a strongly correlated quantum spin Hall insulator*
11:30 — 12:00	Cyril Proust — *Universal T-linear resistivity and Planckian limit in cuprates*
12:00 — 12:30	Johnpierre Paglione — *T-linear transport, Planckian limit, scale invariance and nematicity in a disordered pnictide*
12:30 — 14:30	**Lunch**
14:30 — 19:00	Poster session & Coffee break
15:30 — 17:00	Business meeting (Program members and Advisors only)
19:00 —	**Self Organized Dinner**

Saturday, June 2

07:00 — 08:15	**Breakfast**
08:30 — 09:15	Drew Potter — *On Floquet phases*
09:15 — 10:00	Clifford Hicks — *The nematic transition of FeSe and other correlated electron phenomena under uniaxial stress*
10:00 — 11:00	**Coffee break**
11:00 — 11:30	Seamus Davis — *Magnetic-field induced pair density wave state in cuprates*
11:30 — 12:00	Joseph Thywissen — Optical conductivity of ultracold fermions in optical lattices
12:00 — 12:30	Hae-Young Kee — *Kitaev spin liquid and nearby phases*
12:30 — 14:30	**Lunch**
14:30 —	**Free time & Departure**

Speakers

Simon Verret
Université de Sherbrooke

Introduction to experimental aspects of frustrated magnetism

Glen Evenbly
Université de Sherbrooke

Tensor networks and applications

Laura-Isabelle Dion-Bertrand
Photon Etc.

Careers opportunities in Physics

Eun-Ah Kim
Cornell University.

Applications of AI for quantum condensed matter physics

Elia Razzoli
University of British Columbia

New approaches in Time- and Spin-resolved ARPES

Speakers

Jenny Hoffman
Havard University

STM of superconductivity & STM of strongly correlated topological material (SmB_6)

Alannah Hallas
Rice University

Introduction to experimental aspects of frustrated magnetism

Stephen Hayden
University of Bristol

Measuring Magnetic Excitations with Neutrons

Liang Fu
MIT

Electronic structure of twisted bilayer graphene

Cyril Proust
LNCMI-Toulouse

Recent result on linear resistivity in cuprates

Joseph Maciejko
University of Alberta

Interacting Topological Materials

Posters

Summer School Session

- **Alexandre Arsenault**
  ^{139}La NMR Study of Charge Order in $La_{2-x}Sr_xCuO_4$ Single Crystals (10%, 11.5%, 13%)
- **Graham Baker**
  Ultra-long-lived quasiparticles in FeSe revealed by broadband microwave
- **Siham Benhabib**
  Evidence of two components order parameter of Sr_2RuO_2 by ultrasounds measurements
- **Marie-Eve Boulanger**
  Heat Transport in the Kondo iIsulator SmB_6: field-dependent magnetic scattering
- **Patrick Bourgeois-Hope**
  Origin of the upturn in resistivity in cuprates probed by thermal conductivity
- **Connor Buhariwalla**
  Long Wavelength Correlations in Ferromagnetic Titanate Pyrochlores as Revealed by Small Angle Neutron Scattering
- **Taras Chouinard**
  Probing time reversal symmetry breaking with microwaves
- **Rantong Gong**
  Detecting the spin polarization of surface state of topological materials
- **Jacob Gordon**
  Selective Phonon Damping in Topological Semimetals
- **Adrien Gourgout**
  Pressure induced suppression of the Pseudogap in the Cuprate superconductor Nd-LSCO
- **Rafael Haenel**
  Chern Insulator on a Circuit Boarddrostatic Pressure
- **Lingyun He**
  Suppression of the Anisotropic Phase of $Sr_3Ru_2O_7$ Hydrostatic Pressure
- **Gavin Hester**
  Discovery of a New Quantum Dimer Magnet in a Strongly Spin-Orbit Coupled Material
- **Sho Higashikawa**
  Floquet chiral magnetic effect

Posters

- **Joel Hutchinson**
  Low Energy Rashba Conductivity
- **Fabian Jerzembeck**
  Upper Critical Field of Sr2RuO4 under uniaxial strain
- **Mi Jiang**
  Relevance of atomic multiplet structure in models of cuprate layers
- **Étienne Lantagne-Hurtubise**
  Strain-induced Landau levels in graphene: A momentum-resolved theory
- **Nicholas Lee-Hone**
  Disorder and the overdoped cuprates - application to LSCO
- **Étienne Lefrançois**
  To be announced
- **ChengShu Li**
  Family of Sachdev-Ye-Kitaev models motivated by experimental considerations
- **Chunxiao Liu**
  Projective symmetry group classification of Z2 spin liquids in a pyrochlore lattice
- **Pengzi Liu**
  Superconductivity and Surface Defects of In-Doped SnTe Nanostructures Grown by Chemical Vapor Deposition
- **Maude Lizaire**
  Transport signatures of the pseudogap in Bi2201
- **James Maldaner**
  Self Assembled On-Chip Fabry-Perot Microcavities for Integrated Atomic Optics
- **Cole Mauws**
  Effects of Disorder on Monopole Crystallization
- **Philippa McGuinness, Elina Zhakina**
  Transport in delafossite microstructures
- **Tristan Metz**
  Non-Fermi Liquid Transport in AFe_2As_2 (A=K,Rb,Cs)
- **Hinako Murayama**
  Coexistence of localized- and itinerant-gapless excitations in spin liquid of 1T-TaS2
- **Yuya Ominato**
  Electronic polarization in topological nodal semimetal thin film

Posters

- **Megan Rutherford**
  Dy_2ScNbO_7: an unconventional spin ice candidate?
- **Ariane Soret**
  To be announced
- **Brandon Stuart**
  Scanning Tunnelling Microscopy of the Topological Dirac Semimetal ZrSiTe
- **Kyle Wamer**
  To be announced
- **Zhiqiang Wang**
  Effects of deep superconducting gap minima on impurity induced residual thermal transport in Sr_2RuO_4.
- **Tatiana Webb**
  Cuprate QPT at commensurate-incommensurate density wave transition
- **John Woods**
  Synthesis of Single-Crystalline WTe_2 Nanowires and Their Electrical Properties
- **Hennadii Yerzhakov**
  Critical Properties of Superconducting Quantum Phase Transition in Disordered Dirac Fermion Systems
- **Colin Sarkis**
  Partial Order in $Fe_3PO_4O_3$
- **Macy Stavinoha**
  Charge density wave behavior and order-disorder through doping in the magnetic and non-magnetic sublattices in $EuGa_4$
- **Sean Takahashi**
  NMR Investigation of $Yb_2Pt_2O_7$
- **Jiaming Wang**
  To be announced
- **Xin Wang**
  Spontaneous edge current in high chirality superconductors
- **Brandon Wilfong**
  Tetrahedral transition metal chalcogenides as functional inorganic materials
- **Fan Yang**
  To be announced
- **Charles Zhang**
  Effects of Epitaxial Strain and Oxygen Content on Superconductivity in Manganite/Cuprate Thin-Film Heterostructures

Posters

- **Hao Zhang**
  Superoxygenation Study of Cuprate and Iridate Thin Films
- **Mark Zic**
  Enhancement of SC through γ-irradiation

Thank you!

The organizing committee

Marie-Eve Boulanger
Maude Lizaire
Olivier Simard
Étienne Lantagne-Hurtubise