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

Posters

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

Posters

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

Posters

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

Thank you!

The organizing committee

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