



Banff International Research Station

for Mathematical Innovation and Discovery

Topological Phenomena in Quantum Dynamics and Disordered Systems

Feb 3 - Feb 8, 2013

MEALS

*Breakfast (Buffet): 7:00 – 9:30 am, Sally Borden Building, Monday – Friday

*Lunch (Buffet): 11:30 am – 1:30 pm, Sally Borden Building, Monday – Friday

*Dinner (Buffet): 5:30 – 7:30 pm, Sally Borden Building, Sunday – Thursday

Coffee Breaks: As per daily schedule, in the foyer of the TransCanada Pipeline Pavilion (TCPL)

***Please remember to scan your meal card at the host/hostess station in the dining room for each meal.**

MEETING ROOMS

All lectures will be held in the lecture theater in the TransCanada Pipelines Pavilion (TCPL). LCD projector and blackboards are available for presentations.

SCHEDULE

Sunday

16:00 Check-in begins (Front Desk – Professional Development Centre - open 24 hours)

17:30-19:30 Buffet Dinner

20:00 Informal gathering in 2nd floor lounge, Corbett Hall (if desired)

Beverages and small assortment of snacks are available on a cash honor system.

Monday

7:00-8:45 Breakfast

8:45-9:00 Introduction and Welcome by BIRS Station Manager, TCPL

9:00 Session I: Topological Insulators

9:00-9:25	Gian Michele Graf	Bulk-edge duality for topological insulators
9:30 – 9:55	Ion Garate	Phonon-induced topological transitions and crossovers in Dirac materials
10:00-10:30	Coffee Break	
10:30-10:55	Shinsei Ryu	Effective field theories for topological insulators by functional bosonization
11:00 – 11:25	Andrea Damascelli	Layer-by-layer entangled spin-orbital texture of the topological surface state in Bi ₂ Se ₃

11:30-13:00 Lunch

13:00-14:00 Guided Tour of The Banff Centre; meet in the 2nd floor lounge, Corbett Hall

14:00 Group Photo; meet in foyer of TCPL (photograph will be taken outdoors so a jacket might be required).

14:30 Session II: Interacting systems

14:30 – 14:55	Assa Auerbach	p6 - Chiral Spin Liquid in the Kagome Antiferromagnet
15:00-15:30	Israel Klich	Full counting statistics and Edgeworth expansion for Matrix Product States
15:30 – 15:55	Coffee Break	
16:00-16:25	Matthew Foster	Interaction-mediated surface state instability in dirty topological superconductors
16:30 – 16:55	Andrei Bernevig	Nonabelian fractional quantum hall matrix product states
17:00-17:30	Taylor Hughes	Torsion, Viscosity, and the bulk-boundary correspondence

17:30-19:30 Dinner

19:30-20:30

Yuval Oreg:

Majoranas in wires: theory, experiments and fractionalization

Tuesday

7:00-9:00 Breakfast

9:00 Session III: Cold atomic and optical systems

9:00 – 9:25	Nigel Cooper	Designing Topological Bands for Ultracold Atomic Gases
9:30 – 9:55	Alexey Gorshkov	Realizing topological phases with dipolar spins
10:00-10:30	Coffee Break	
10:30-10:55	Sylvain Nascimbene	Realizing topological superfluids with ultracold atomic gases
11:00 – 11:25	Mikael Rechtsman	Photonic topological insulators

11:30-13:30 Lunch

15:00 Session IV: Disordered systems

15:00 – 15:25	Julia Meyer	Disordered topological metals
15:30 – 16:00	Coffee Break	
16:00-16:25	Matt Hastings	Almost Commuting Matrices and Topological Insulators"
16:30 – 16:55	Terry Loring	K-theory invariants for almost commuting matrices
17:00 - 17:25	Anton Akhmerov	Statistical topological insulators
17:30 – 17:55	Peter Armitage	How to kill a topological insulator

18:00-19:30 Dinner

19:30-20:30

Duncan Haldane:

The marriage of topology with geometry in the fractional quantum Hall effect: 'Hall viscosity' and the origin of incompressibility

Wednesday

7:00-8:30 Breakfast

8:30 Session V: Topological phases (1)

8:30 – 8:55	Matthew Fisher	A 3d Boson Topological insulator and the “Statistical Witten effect”
9:00-9:25	Victor Gurarie	Topological invariants for the fractional quantum Hall states

9:30 – 10:00 Informal discussions

10:00 – 10:30 Coffee Break

10:30 - 11:30 Informal discussions

11:30-13:30 Lunch

Free Afternoon

17:30-19:00 Dinner

19:00 Session VI: Topological phases (2)

19:00-19:25	Lukasz Fidkowski	Symmetry Enriched Topological Phases
19:30 – 19:55	Xiao-Liang Qi	Momentum polarization: an entanglement measure of topological spin and chiral central charge

20:00-20:30 Break

20:30-21:30 **Zahid Hasan:**
Topological Surface States : Recent Results

Thursday

7:00-9:00 Breakfast

9:00 **Session VII: Topological superconductivity and Majorana Fermions**

9:00 – 9:25	Kirill Shtengel	From Majorana to parafermion zero modes
9:30 – 9:55	Erez Berg	Time reversal invariant topological superconductivity and fermion parity pumping in quantum wires
10:00 – 10:25	Coffee Break	
10:30-10:55	Carlo Beenakker	Fermion-parity anomaly of the critical supercurrent in the quantum spin-Hall effect
11:00-11:25	Jens Bardarson	Quantum transport and two-parameter scaling at the surface of a weak topological insulator

11:30-13:30 Lunch

13:30 **Session VIII: Dynamical systems**

13:30 – 13:55	Mark Rudner	Anomalous edge states and the bulk-edge correspondence for periodically-driven two dimensional systems
14:00 – 14:25	Daniel Podolsky	Modulated Floquet topological insulators
14:30-14:55	Dominic Marchand	Lattice model for the surface states of a topological insulator
15:00 – 15:30	Coffee Break	
15:30 - 15:55	Joseph Avron	Topological quantum numbers in Lindblad dynamics
16:00 – 16:25	David Hsieh	Seeing and controlling the surface states of a topological insulator with ultrafast lasers
16:30 - 17:00	Babak Seradjeh	Transport signatures of Floquet Majorana fermions in a driven quantum system

17:30-19:30 Dinner

19:30-20:30

Dennis Drew

Dirac cone shift of a passivated topological Bi₂Se₃ interface state

Friday

7:00-9:00 Breakfast
9:00-10:00 Informal discussions
10:00-10:30 Coffee Break
10:30-11:30 Informal discussions
11:30-13:30 Lunch

Checkout by 12 noon.

** 5-day workshop participants are welcome to use BIRS facilities (BIRS Coffee Lounge, TCPL and Reading Room) until 3 pm on Friday, although participants are still required to checkout of the guest rooms by 12 noon. **