



KITP Conference: Theories, Experiments and Numerics on Gapless Quantum Many-body Systems

(May 13-16, 2024)

Coordinators: Ribhu Kaul, Zhu-Xi Luo, Aavishkar Patel and Alex Thomson

Monday, May 13, 2024

Deconfined quantum criticality, Chair: Ribhu Kaul (Penn State)

8:50am Mark Bowick (KITP)
9:20am Yunchen He (Perimeter Inst.)
9:45am Shai Chester (Imperial College)
10:30am

Welcome[Video]
Deconfined phase transition under the fuzzy sphere microscope[Video][CC]
Monopoles, Duality, and Deconfined Quantum Tricriticality[Slides][Video][CC]
Morning Break

11:00am Jonathan D'Emidio (DIPC)
11:45am Anders Sandvik (BU)
12:30pm

Entanglement entropy at deconfined and Gross-Neveu quantum critical points[Video][CC]
SO(5) multicriticality in two-dimensional J-Q models[Slides][Video][CC]
Lunch Break

Spin liquids, Chair: Lucile Savary (ENS Lyon)

2:00pm Leon Balents (KITP)
2:45pm Donna Sheng (CSUN)
3:30pm

Hunting spin liquids: checking out the terrain and identifying the tracks[Video][CC]
Quantum spin liquid, and spin-liquid physics in doped t-J model[Slides][Video][CC]
Afternoon Break

4:00pm Han Ma (Perimeter Inst.)
5:30pm

Conformality in non-Hermitian Potts model[Video]
SHUTTLE TO BWSCI

Tuesday, May 14, 2024

non-Fermi liquids + generalized syms, Chair: Andrey Chubukov (Minnesota)

9:00am Subir Sachdev (Harvard)

Universal theory for quantum phase transitions in two-dimensional metals with Harris disorder[Slides][Video][CC]

9:45am Chao Ming Jian (Cornell)
10:30am

The conjugate composite Fermi liquid and descendants[Video][CC]
Morning Break

11:00am Dominic Else (Perimeter Inst.)
11:45am Zhen Bi (Penn State)
12:30pm

Holographic models of metals[Slides][Video][CC]
Fermionic models with spontaneous dipolar symmetry breaking[Video][CC]
Lunch Break

Generalized symmetries, Chair: Zhu-Xi Luo (Harvard)

2:00pm Xiao-Gang Wen (MIT)
2:45pm Wenjie Ji (Caltech)
3:30pm

A 10-year journey: from non-invertible gravitational anomaly to generalized symmetry, and to a general theory of strongly correlated gapless states[Slides][Video][CC]
Excitations and defects in invertible phases[Slides][Video][CC]
Afternoon Break

4:00pm Carolyn Zhang (Harvard)
4:45pm Yizhi You (Northeastern)
5:30pm

Protected gaplessness in a deformed Ising model[Video][CC]
Spontaneous Strong-to-Weak Symmetry Breaking[Video][CC]
RECEPTION

6:00pm

SPECIAL EVENTS DINNER

7:30pm

SHUTTLE TO BWSCI

Wednesday, May 15, 2024

FQAH, Chair: Alex Thomson (UC Davis)

9:00am Ashvin Vishwanath (Harvard)

Anomalous Hall Crystal: The quintessential quantum crystal and its potential relevance to rhombohedral graphene[Video][CC]

9:45am Long Ju (MIT)
10:30am

Integer and Fractional Quantum Anomalous Hall Effects in Graphene[Slides][Video][CC]
Morning Break

11:00am Jiaqi Cai (University of Washington)
11:45am Hart Goldman (U. Chicago)
12:30pm

Ferromagnetism and Topology of Higher Flat Band in twisted MoTe₂[Embargoed]
Composite fermions and the fractional quantum anomalous Hall effect[Video][CC]
Lunch Break

2d quantum materials, Chair: Yi Ting Hsu (Notre Dame)

1:30pm Stephen Wilson (UCSB)
2:15pm Andrea Young (UCSB)
3:00pm Chenhao Jin (UCSB)
3:30pm

Unconventional dynamics in the quantum disordered antiferromagnet NaRuO₂[Video][CC]
Anyons in van der Waals heterostructures[Video][CC]
Long lived isospin modes in gapless moire graphene[Video][CC]
Afternoon Break

4:00pm Xueyang Song (MIT)

Dirac spin liquid unnecessary quantum critical point on square lattice[Video][CC]

4:45pm Stevan Nadj Perge (Caltech)

Orbit Proximitized Bernal Bilayer Graphene[Video][CC]

5:30pm

RECEPTION

6:00pm

SPECIAL EVENTS DINNER

7:30pm

SHUTTLE TO BWSCI

Thursday, May 16, 2024

Boundary Criticality & Symmetric mass generation, Chair: Cenke Xu (UCSB)

9:00am Max Metlitski (MIT)

Boundaries and defects in the 3d O(N) mode[Video][CC]

9:45am Francesco Parisen Toldin (RWTH Aachen)

Numerical studies of critical behavior in the presence of boundaries and defects[Video][CC]

10:30am

Morning Break

11:00am Yi Zhuang You (UCSD)

Fermi surface anomaly and symmetric mass generation[Video]

11:45am Pavel Volkov (UConn)

Non-linear transport of strange metals[Video]

12:30pm

Lunch Break

Non-Fermi liquids II, Chair: Aavishkar Patel (Flatiron)

2:00pm Zhengyan Darius Shi (MIT)

Excitonic quantum criticality[Slides][Video][CC]

2:45pm Yi-Hsien Du (U. Chicago)

Nonlinear bosonization of (Non-)Fermi Liquids[Video][CC]

3:30pm Natalia Chepiga (TU Delft)

Tunable quantum criticality in multi-component Rydberg atoms[Slides][Video][CC]

4:15pm

CONFERENCE END SHUTTLE TO BWSCI *Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk BEFORE THURSDAY to sign up)