

KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: Aspects and applications of many-body localization

(Nov 16-20, 2015)

Coordinators: Matthew Foster, Vadim Oganesyan, David Pekker
Scientific Advisor: Boris Altshuler

Monday, Nov 16, 2015

Session Chair: Boris Altshuler (Columbia U)

8: 50am	John Berlinsky (KITP)	Welcome
9: 00am	Igor Aleiner (Columbia U)	Basic theory of MBL -- weakly interacting fermions
10: 00am	Antonello Scardicchio (ICTP)	Local integrals of motion in the MBL phase
10: 30am		Morning Break
11: 00am	Joel Moore (Berkeley)	Overview of numerical approaches to MBL
12: 00pm	Maxim Vavilov (U.Wisconsin)	Detecting mobility edges via quench
12: 30pm		Lunch Break

Session Chair: Leticia Cugliandolo (LPTHE)

2: 00pm	David Huse (Princeton)	Overview of entanglement, thermalization, and MBL
3: 00pm	Tarun Grover (KITP)	Universal aspects of MBL transition and Eigenstate Thermalization
3: 30pm		Afternoon Break
4: 00pm	Anushya Chandran (Perimeter)	Two general constraints on the MBL-ETH transition
4: 30pm	Bela Bauer (Microsoft)	Interaction effects in a system with localized and delocalized single-electron states
5: 00pm	Norman Yao (Berkeley)	Quantum control in the many-body localized phase
5: 30pm		SHUTTLE AVAILABLE TO BWSCI

Tuesday, Nov 17, 2015**Session Chair: John Chalker (Oxford)**

- 9:00am Dmitry Abanin (Geneva) A criterion for many-body localization-delocalization transition
- 9:30am Wojciech de Roeck (Brussels) Absence of many-body mobility edges
- 10:00am Richard Berkovits (Bar-Ilan) Signature of MBL in low-lying excitation: entanglement spectrum and entropy
- 10:30am **Morning Break**
- 11:00am Donna Sheng (CSUN) Many-body localization and mobility edge in disordered Heisenberg spin chains and ladders by DMRG
- 11:30am Vedika Khemani (Princeton) Dynamical Response of Many Body Localized Systems
- 12:00pm Bryan Clark (UIUC) A tensor network approach to many-body localization
- 12:30pm **Lunch Break**

Session Chair: Victor Gurarie (Boulder)

- 2:00pm Steven Kivelson (Stanford) Overview of $T=0$ localization phenomena with interactions
- 2:30pm S. Gopalakrishnan (Caltech) Rare regions and low-frequency response in many-body localized states
- 3:00pm Leticia Cugliandolo (LPTHE) Fluctuation-dissipation relations in classical and quantum out of equilibrium systems: efficient tools to test equilibration
- 3:30pm **Afternoon Break**
- 4:00pm Rahul Nandkishore (Boulder) Localized systems coupled to baths
- 4:30pm Yevgeny Bar Lev (Columbia) Nonequilibrium dynamics in many-body localization
- 5:30pm **RECEPTION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

Wednesday, Nov 18, 2015

Cold atoms and real-space RG theory

- 9:00am Ulrich Schneider (Cambridge) Observation and characterization of many-body localization of interacting fermions in a quasi-random optical lattice
- 9:45am Brian DeMarco (UIUC) Many-Body Localization and Relaxation in Optical Lattices
- 10:30am **Morning Break**
- 11:00am Andrew Potter (Berkeley) Universal scaling properties of many-body (de)localization transitions
- 11:30am Ivar Martin (ANL) Dynamics of random Heisenberg model from real space RG
- 12:00pm Ehud Altman (Weizmann) A renormalization group approach for critical thermalization and entanglement at the MBL transition
- 12:30pm **Lunch Break**
- 2:00pm **FREE AFTERNOON -- SHUTTLE AVAILABLE TO BWSCI**

Thursday, Nov 19, 2015**Session Chair: David Huse (Princeton)**

- 9:00am Vladimir Kravtsov (ICTP) Overview of multi-fractality
- 10:00am Lara Faoro (LPTHE) Flux Noise in Superconducting Circuits: The Old Problem and the New Developments
- 10:30am **Morning Break**
- 11:00am Lev Ioffe (Rutgers) Non-ergodic metallic and insulating phases of Josephson junction chains
- 11:30am Victor Gurarie (Boulder) Unconventional localization transition in high dimensions
- 12:00pm Deepak Iyer (Bucknell) Link cluster expansions
- 12:30pm **Lunch Break**

Session Chair: Ivar Martin (ANL)

- 2:00pm Gora Shlyapnikov (ORSAY) Many-body physics with cold particles
- 3:00pm Sergej Flach (IBS, Korea) Classical nonlinear lattices - any MBL ?
- 3:30pm **Afternoon Break**

- 4:00pm Gabriel Aeppli (ETH) TBA
- 4:45pm Mikhail Lukin (Harvard) Quantum thermalization in dipolar spin systems
- 5:30pm **RECEPTION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

Friday, Nov 20, 2015

Session Chair: Donna Sheng (CSUN)

- 9:00am Frank Pollmann (MIP-PKS) Efficient numerical simulations of many-body localized systems
- 9:30am F. Heidrich-Meisner (Munich) Many-body localization characterized from a one-particle perspective
- 10:00am Miguel Ortuno (Murcia, Spain) Numerical Simulations of Many-Body Localization
- 10:30am **Morning Break**
- 11:00am Rajiv Singh (UC Davis) Early Breakdown of area-law entanglement at the many-body delocalization transition
- 11:30am Chris Monroe (UMD) Observation of MBL states in trapped ion spin chains
- 12:30pm **Lunch Break**

Free form discussions

- 5:30pm **SHUTTLE AVAILABLE TO BWSCI *Also available to SB Airport and SB airbus Goleta location* (see registration desk BEFORE FRIDAY to sign up)**