

**KAVLI INSTITUTE FOR THEORETICAL PHYSICS**  
**www.kitp.ucsb.edu**

## KITP Conference: Quantum Thermodynamics

(Jun 25-29, 2018)

**Coordinators: Antonio Acín, Gabriele De Chiara, Sabrina Maniscalco,  
and Jukka Pekola**

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### Monday, Jun 25, 2018

**Session Chair: Jukka Pekola (Aalto U)**

8:50am Lars Bildsten (KITP)	Welcome
9:00am Irfan Siddiqi (UC Berkeley)	The Evolution of Quantum Trajectories: From Observation to Feedback
9:45am Eric Lutz (U Stuttgart)	Irreversibility and the quantum arrow of time
10:30am	<b>Morning Break</b>
11:00am Adolfo del Campo (UMass Boston)	Quantum thermodynamics of complex systems
11:45am Rui Sampaio (Aalto U)	The Impossible Quantum Work Distribution
12:15pm Javier Cerrillo (TU Berlin)	Fluctuation theorems for non-equilibrium
12:45pm	<b>Lunch Break</b>

**Session Chair: W. Zurek (Los Alamos National Lab, US)**

2:00pm Juan Pablo Paz (U de Buenos Aires)	Cooling a quantum Oscillator
2:45pm André Carvalho (Griffith U)	Quantum heat engine operating between thermal and spin reservoirs
3:15pm	<b>Afternoon Break</b>
3:45pm Kavan Modi (Monash U)	Complete framework for non-Markovian quantum processes: A path towards quantum stochastic energetics

- 4:15pm Alessandro Romito  
(Lancaster U) Energy exchange in quantum measurement processes: from heat and work tracking to a repeated-measurement heat engine
- 4:45pm Caio Lewenkopf  
(U Federal Fluminense) Landauer-Büttiker Approach to Strongly Coupled Quantum Thermodynamics: Entropy Evolution
- 5:30pm **SHUTTLE TO BWSCI**

## **Tuesday, Jun 26, 2018**

- 9:00am Benjamin L. Lev (Stanford U) Thermalization near Integrability in a Dipolar Quantum Newton's Cradle
- 9:45am Ulrich Schneider (U Cambridge) Quantum thermodynamics (and its breakdown) in optical lattices
- 10:30am **Morning Break**
- 11:00am Ivan Khaymovich  
(Max Planck Dresden) Stochastic thermodynamics in single electron circuits
- 11:45am David Jennings (U Oxford) Coherent majorization and a complete set of entropic conditions for quantum thermodynamics
- 12:15pm Philippe Faist (Caltech) Asymptotically reversible thermodynamic simulation of quantum channels
- 12:45pm **Lunch Break**
- Poster session**
- 3:15pm **Afternoon Break**
- 5:30pm **RECEPTION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

## **Wednesday, Jun 27, 2018**

**Session Chair: Robert Alicki (U Gdansk, Poland)**

9:00am	Alexia Auffèves (CNRS and U Grenoble Alpes)	Energetic footprints of quantum noise
9:45am	Dzmitry Matsukevich (NU Singapore)	Quantum absorption refrigerator with trapped ions
10:30am	<b>Morning Break</b>	
11:00am	Masahito Ueda (U Tokyo)	Atypicality of most few-body observables
11:45am	Rui Pan (Peking U)	Experimental test of the differential fluctuation theorem and a generalized Jarzynski equality for arbitrary initial states
12:15pm	Matteo Lostaglio (ICFO)	Quantum fluctuation theorems, contextuality and work quasi-probabilities
12:45pm	<b>Lunch Break</b>	
2:00pm	<b>FREE AFTERNOON-Shuttle Available to BWSCI</b>	

## Thursday, Jun 28, 2018

### **Session Chair: Janet Anders (U Exeter, UK)**

9:00am	Ferdinand Schmidt-Kaler (J. Gutenberg U.)	A single ion spin heat engine coupled to a harmonic oscillator ?ywheel
9:45am	Roberta Zambrini (IFISC)	Collective dissipation: Dynamic and thermodynamic effects
10:30am	<b>Morning Break</b>	
11:00am	Roberto M. Serra (U Federal do ABC)	Experimental implementation of a quantum heat engine and its frictionless version
11:45am	Kater Murch (Washington U)	Information gain and loss for a quantum Maxwell's demon
12:15pm	Karen Hovhannisyan (Aarhus U)	Autonomous thermal rotor in the quantum regime
12:45pm	<b>Lunch Break</b>	

### **Session Chair: Marcos Rigol (Penn State, US)**

2:00pm	Jörg Schmiedmayer (TU Wein)	One-dimensional atomic superfluids as a model system for quantum thermodynamics
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- 2:45pm Maxime Richard  
(CNRS - Institut Néel) Physics of heat transfer with a nonequilibrium quantum fluid of polaritons
- 3:15pm **Afternoon Break**
- 3:45pm Mari Carmen Bañuls  
(Max Planck Garching) Using Matrix Product Operators for non-equilibrium problems
- 4:30pm Nicole Yunger Halpern (Caltech) MBL-mobile: Many-body-localized engine
- 5:00pm Elisa Bäumer (ETH Zürich) Partial Thermalizations Allow for Optimal Thermodynamic Processes
- 5:30pm **RECEPTION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

## **Friday, Jun 29, 2018**

**Session Chair: Dzmitry Matsukevich (NU Singapore)**

- 9:00am Nikolaj Kiesel (U Vienna) Exploring the thermodynamics of small systems with levitated optomechanics
- 9:45am Tobias Donner (ETH Zürich) Driven-dissipative crystals of matter and light
- 10:30am **Morning Break**
- 11:00am Michele Campisi (U Florence) Quantum Measurement Cooling
- 11:45am Claudia Clarke  
(U College London) Dissipation production in a closed two-level quantum system as a test of the observability of the dynamics
- 12:15pm Felix Binder  
(Nanyang Technological U) Thermodynamics of causal modelling
- 12:45pm Closing remarks
- 12:50pm **Lunch Break**
- 2:00pm **CONFERENCE ENDS-SHUTTLE TO BWSCI \*Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk BEFORE FRIDAY to sign up.)**