

KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: Non-equilibrium Dynamics of Strongly Interacting Photons

(Oct 5-9, 2015)

Coordinators: Jacqueline Bloch, Rosario Fazio, Mohammad Hafezi, Atac Imamoglu

Monday, Oct 05, 2015

Session Chair: Jacqueline Bloch (LPN-CNRS)

8:50am	Lars Bildsten (KITP)	Welcome
9:00am	Iacopo Carusotto (Trento)	An overview of quantum fluids of light: first successes and many exciting perspectives
9:45am	Alberto Amo (LPN-CNRS)	Microcavity polaritons in lattices
10:30am		Morning Break
11:00am	Florian Marquardt (Erlangen)	Topological phases of sound and light
11:45am	Konrad Lehnert (JILA)	Noiseless mode conversion of microwave fields
12:30pm		Lunch Break

Session Chair: Mohammad Hafezi (JQI-Maryland)

2:00pm	Shanhui Fan (Stanford)	Photonic gauge field as emerged from dynamic modulations: recent advances
2:45pm	Alejandro Yacomotti (LPN/CNRS)	Spontaneous symmetry breaking in coupled photonic crystal nanolasers
3:30pm		Afternoon Break
4:00pm	Jens Koch (Northwestern U)	Validating open quantum simulators by lindblad resummation techniques
4:45pm	Oskar Painter (Caltech)	Towards single-photon strong coupling in optomechanical crystals
5:30pm		SHUTTLE TO BWSCI

Tuesday, Oct 06, 2015

Session Chair: Rosario Fazio (Scuola Normale Superiore)

- 9:00am Mikhail Lukin (Harvard) Quantum dynamics of strongly interacting atoms and photons
- 9:45am Sebastian Diehl (TU Dresden) Driven Markovian quantum criticality + Fate of the KT transition
- 10:30am **Morning Break**
- 11:00am Hakan Tureci (Princeton) Cavity QED lattices: A platform to study many-body physics with photons
- 11:45am Cristiano Ciuti (U Paris) Advances and challenges in the theory of strongly correlated photonics systems
- 12:30pm **Lunch Break**

Session Chair: : Alexey Gorshkov (JQI-NIST)

- 2:00pm Giovanna Morigi (Saarland U) Glassiness and long-range order in cavity self-organization
- 2:45pm M. Fleischhauer (Kaiserslautern) Tunable Fröhlich Polarons of slow-light polaritons in a Bose-Einstein condensate
- 3:30pm **Afternoon Break**
- 4:00pm Jon Simon (James Franck Inst) Topological photonics with twisted resonators and braided circuits

POSTER SESSION

5:30pm

RECEPTION

6:00pm

SPECIAL EVENTS DINNER

8:00pm

SHUTTLE TO BWSCI**Wednesday, Oct 07, 2015****Session Chair: Iacopo Carusotto (Universita' di Trento)**

- 9:00am Ajit Srivastava (ETH Zürich) 2D materials: A new platform for strong light-matter interactions
- 9:45am Sriram Ganeshan (U Maryland) Photonic quantum hall effect: lessons from Chern-Simons perspective
- 10:30am **Morning Break**

11:00am A. Wallraff (ETH Zurich) Interactions of photons and qubits in one-dimensional super conduction circuits

11:45am Pedram Roushan (UCSB) Strongly interacting photons in a synthetic magnetic field

12:30pm **Lunch Break**

2:00pm **FREE AFTERNOON-Shuttle Available to BWSCI**

Thursday, Oct 08, 2015

Session Chair: Sussane Yelin (U Connecticut)

9:00am Alexey Gorshkov (NIST-JQI) Few-body and many-body physics with Rydberg polaritons

9:45am Vladan Vuletic (MIT) Strongly interacting traveling optical photons

10:30am **Lunch Break**

11:00am Guido Pupillo (ISIS) Cavity enhanced transport of excitons and charge

12:30pm **Lunch Break**

Session Chair: Jacob Taylor (JQI-NIST)

2:00pm Susanne Yelin (U Connecticut) Entanglement and coherence in many-body dipolar systems

2:45pm Amo Rauschenbeutel (TU Vienna) Chiral interaction of light and matter in confined geometries

3:30pm **Afternoon Break**

4:00pm Angela Vasanelli (Paris Diderot) Collective electronic excitations for ultra-strong coupling and superradiance

4:45pm Saran Gopalakrishnan (Harvard) Prethermal floquet steady states and instabilities in driven bosonic systems

5:30pm **RECEPTION**

6:00pm **SPECIAL EVENTS DINNER**

8:00pm **SHUTTLE TO BWSCI**

Friday, Oct 09, 2015

Session Chair: Atac Imamoglu (ETHZ)

- 9:00am Monika Schleier-Smith (Stanford) Quantum engineering and quantum simulation with light-mediated interactions
- 9:45am Eugene Demler (Harvard) Hidden order in a two cavity system
- 10:30am **Morning Break**
- 11:00am Darrick Chang (ICFO) Engineering strong photonic with atoms coupled to photonic crystal
- 11:45am Gil Refael (Caltech) Topolaritons and topological excitons in solid-state systems
- 12:30pm **Lunch Break**
- 2:00pm **SHUTTLE TO BWSCI**