



EMMI Workshop on Long-range interactions in the ultracold (September 06th-09th 2022)

EXTENDED PROGRAM

Tuesday 06th September

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| 17:00 – 17:30 | Registration (Claudiana palace, Herzog-Friedrich-Straße 3, 6020 Innsbruck) |
| 17:30 – 17:50 | Opening – Welcome speech |
| 17:50 – 18:10 | Carlo Ewerz – EMMI presentation |
| 18:15 – 19:00 | Buffet |

All workshop talks will be held in HS A at the University Innsbruck Campus Technik at the NATWI building (Technikerstraße 25, 6020 Innsbruck).

Wednesday 07th September

Light-induced

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| 08:15 – 08:45 | Registration <i>Foyer in front of HS A</i> |
| 08:45 – 09:00 | Welcome |
| 09:00 – 09:45 | J. Thompson [KEYNOTE SPEAKER]: <i>Infinite Range Interactions for Many-body Physics and Quantum Sensing</i> |
| 09:45 – 10:15 | P. Schneeweiss: <i>Superradiant burst of light from macroscopically separated emitters</i> |
| 10:15 – 10:45 | J-B. Beguin [HOT TOPIC]: <i>The integration of photonic crystal waveguides with 2D atom arrays</i> |
| 10:45 – 11:15 | Coffee break |

Rydberg

- 11:15 – 11:45 H. Bernien: *A dual-species atom array processor*
- 11:45 – 12:15 A. Young: *Programmable quantum sensors with alkaline earth atom array*
- 12:15 – 13:45 Lunch break**

Molecules

- 13:45 – 14:30 S. Ospelkaus [KEYNOTE SPEAKER]: *Quantum gases of ultracold polar molecules*
- 14:30 – 15:00 S. Cornish: *Ultracold RbCs Molecules: Robust Storage Qubits and Rotationally Magic Traps*
- 15:30 – 16:00 Coffee break**
- 16:00 – 16:30 J.-R. Li: *Dipole-mediated itinerant spin dynamics with polar molecules*
- 16:30 – 17:00 X.-Y. Luo [HOT TOPIC]: *From a strongly interacting Bose-Fermi mixture to a dipolar quantum gas of molecules*
- 17:00 – 19:00 Poster session, **Brezel & Bier**

Thursday 08th September

Magnetic Atom

- 09:00 – 09:45 S. Nascimbène [KEYNOTE SPEAKER]: *Realization of an atomic quantum Hall system in four dimensions*
- 09:45 – 10:15 C. Politi: *Many-body quantum phases of dipolar gases*
- 10:15 – 10:45 T. Langen: *Dipolar supersolids: from magnetic atoms to molecules*
- 10:45 – 11:15 Coffee break**
- 11:15 – 11:45 M. Šindik [HOT TOPIC]: *Creation and robustness of quantized vortices in a dipolar supersolid when crossing the superfluid-to-supersolid transition*
- 11:45 – 12:15 Z. Ye [HOT TOPIC]: *Interaction tuning in fermionic mixtures of Dy and K*
- 12:15 – 13:45 Lunch break**

Rydberg

13:45 – 14:30	M. Weidemüller [KEYNOTE SPEAKER]: <i>Does an isolated quantum spin system thermalize?</i>
14:30 – 15:00	J. Ahn: <i>Rydberg atom arrays for NP-complete problems</i>
15:30 – 16:00	Coffee break
16:00 – 16:30	T. Zache: <i>Qudit-based quantum simulation with Rydberg atoms - from large-spin Heisenberg models to gauge theories</i>
16:30 – 17:00	C. Sayrin [HOT TOPIC]: <i>Circular Rydberg atoms trapped in an array of optical tweezers</i>
18:00 – 19:00	Hike (optional) meeting point: in front of HS A at 17:05 or at Bergisel 2, 6020 Innsbruck at 18:15
19:00	Conference Dinner (1809, Bergisel 2, 6020 Innsbruck)

Friday 09th August

Ion

09:00 – 09:45	G. Pagano [KEYNOTE SPEAKER]: <i>Out-of-Equilibrium Phenomena in Long-range Interacting Spin Systems</i>
09:45 – 10:15	C. Roos: <i>Learning entanglement in a trapped-ion quantum simulator</i>
10:15 – 10:45	P. Haslinger [HOT TOPIC]: <i>Observation of Light-Induced Dipole-Dipole Forces in Ultracold Atomic Gases</i>
10:45 – 11:15	Coffee break

Light-Induced

11:15 – 11:45	H. Ritsch: <i>Nonlinear nano-optical devices based on coupled quantum emitter arrays</i>
11:45 – 12:15	I. Ferrier-Barbut: <i>Superradiant phase transition in free-space atomic clouds</i>
12:15 – 13:45	Lunch break

Rydberg

13:45 – 14:00	Talk of poster winner
14:00 – 14:30	C. Chen: <i>Continuous Symmetry Breaking in a Two-dimensional Rydberg Array</i>

- 14:30 – 15:00 M. Berngruber: *Observation of dynamic ion-Rydberg interactions by a high-resolution ion microscope*
- 15:30 – 16:30 Coffee break and departure**
- 16:30 – 18:00 Lab Tours (optional) meeting point: 16:30 in front of lecture Hall A