



A crucial ingredient for realizing various phases of matter is the availability of interactions with different range and strength. Atoms excited to Rydberg states exhibit long-range, switchable, interactions that are many orders of magnitude stronger than the typically short-range interactions between ground-state neutral atoms. In addition, relaxation and dissipation can be introduced in this system in a controlled way. Such systems are thus uniquely suited to simulate and study coherent and dissipative quantum dynamics of strongly-interacting many-body systems. The aim of this Workshop is to bring together renown experts, senior and junior researchers, for a productive and inspiring discussion on the recent progress and future directions of research on open many-body quantum systems using Rydberg atoms and photons.

Topics of the workshop:

- Nonlinear quantum optics with Rydberg EIT and related effects
- Interfacing and hybridizing Rydberg atoms with other systems
- Resonant and non-resonant excitation of strongly interacting Rydberg lattice gases
- Dissipative preparation of correlated photonic and atomic states
- Molecules of Rydberg atoms

Invited Speakers:

Charles Adams (Durham University)
 József Fortágh (University of Tübingen)*
 Christian Gross (MPQ Garching)
 Thierry Lahaye (Institut d'Optique, CNRS)*
 Igor Lesanovsky (University of Nottingham)
 Mikhail Lukin (Harvard University)*
 Klaus Mølmer (Aarhus University)
 Herwig Ott (University of Kaiserslautern)*
 Tilman Pfau (Stuttgart University)
 Thomas Pohl (Aarhus University)
 Guido Pupillo (University of Strasbourg)
 Matthias Weidemüller (Heidelberg University)

Organizers: Michael Fleischhauer & David Petrosyan
<http://www.iesl.forth.gr/conferences/Rydberg/>

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