



The Abdus Salam  
**International Centre  
for Theoretical Physics**



## Advanced Workshop on Non-equilibrium Bosons: From Driven Condensates to Non-Linear Optics

Cosponsor(s): U.S. National Science Foundation & International Institute for Complex Adaptive Matter  
Organizer(s): B.L. Altshuler (USA), S. Flach (New Zealand), A. Imamoglu (Switzerland), A. Kavokin (UK), V. Yudson (Russia). ICTP Local Organizer: M. Kiselev  
Trieste - Italy, 19 - 23 August 2013

**Venue: Adriatico Guest House Kastler Lecture Hall**

### Programme

**Monday, 19 August 2013** (Room:Adriatico Guest House Kastler Lecture Hall)

- 08:30 - 09:30** (Room: Adriatico Guest House - Kastler Lecture Hall Area (Lower Level 1))  
--- Registration and Administrative formalities ---
- 09:30 - 09:45** **Opening**
- 09:45 - 10:30** **M. Segev**  
**Light, Disorder, and Photonic Topological Insulators**
- 10:30 - 11:00** --- Coffee break ---
- 11:00 - 11:45** **D. Stone**  
**A Scattering Approach to Complex Laser Systems and Coherent Perfect Absorption**
- 11:45 - 12:30** **B. Deveaud**  
**Disorder stabilized topological defects in polariton condensates**
- 12:30 - 14:00** --- Lunch ---
- 14:00 - 14:45** **E. Ostrovskaya**  
**Driven dissipative Bose-Einstein condensates in periodic potentials**

- 14:45 - 15:00**     **R. Frank**  
**Contributed talk: Photonics transport theory: Nonlinear response and random lasing in disordered complex media**
- 15:00 - 15:30**     --- Coffee break ---
- 15:30 - 16:15**     **M. Wouters**  
**Nonequilibrium polariton quantum fluids**
- 16:15 - 17:00**     **N. Fabbri & M. Inguscio**  
**Ultra-cold bosons in one dimension**
- 17:00 - 19:30**     --- Free time/Discussions ---
- 19:30 - 21:30**     (Room: Adriatico Guest House (Terrace))  
 --- Welcome Reception ---

**Tuesday, 20 August 2013 (Room:Adriatico Guest House Kastler Lecture Hall)**

- 09:00 - 09:45**     **C. Ciuti**  
**Quantum fluids of light and strongly correlated photons**
- 09:45 - 10:30**     **M. Fraser & Y. Yamamoto**  
**Modified excitation spectrum and superfluidity in open-dissipative polariton condensates**
- 10:30 - 11:00**     --- Coffee break ---
- 11:00 - 11:45**     **Y. Rubo**  
**Dissipative coupling and symmetry breaking in exciton-polariton condensates**
- 11:45 - 12:30**     **A. Amo**  
**Dynamics of coupled polariton condensates**
- 12:30 - 14:00**     --- Lunch ---
- 14:00 - 14:30**     **K. Rayanov**  
**Contributed talk: Amplification of evanescent waves - novel dynamical regimes with exciton-polariton condensates and optical couplers**
- 14:30 - 15:00**     **M. Kulkarni**  
**Contributed talk: Cavity-mediated near-critical dissipative dynamics of a driven condensate**
- 15:00 - 15:30**     --- Coffee break ---
- 15:30 - 16:15**     **D. Krizhanovskii**  
**Polariton solitons in semiconductor microcavities and waveguides in the strong coupling regime**
- 16:15 - 16:30**     **P. Kirton**  
**Contributed talk: A non-equilibrium model of photon condensation**
- 17:30 - 19:00**     (Room: Leonardo da Vinci Building Main Lecture Hall)  
**A. Aspect**  
**Colloquium: "From Einstein's intuition to quantum bits: a new quantum age?"**

**Wednesday, 21 August 2013 (Room:Adriatico Guest House Kastler Lecture Hall)**

- 09:00 - 09:45**     **J. Baumberg**  
**Quantum tornadoes: manipulating macroscopic quantum states in real time**
- 09:45 - 10:30**     **S. Hoefling**  
**Exciton-polariton lasers in a magnetic field**
- 10:30 - 11:00**     --- Coffee break ---
- 11:00 - 11:45**     **N. Berloff**  
**Magnon condensate in Yttrium Iron Garnet films**
- 11:45 - 12:30**     **L.V. Butov**  
**Spontaneous coherence and spin currents in a gas of indirect excitons**
- 12:30 - 14:00**     --- Lunch ---
- 14:00 - 14:45**     **A. Aspect**  
**Anderson localization of ultra-cold atoms**
- 14:45 - 15:00**     **X. Yu**  
**Contributed talk: Localization of disordered bosons and magnets in random fields**
- 15:00 - 15:30**     --- Coffee break ---
- 15:30 - 16:00**     **M. Hafezi**  
**Contributed talk: Non-equilibrium quantum Hall physics with photons**
- 16:00 - 16:15**     **W. Nitsche**  
**Contributed talk: Quasi-long-range spatial coherence in an exciton-polariton condensate**
- 16:15 - 17:00**     **S. Fishman**  
**The nonlinear Schroedinger equation with a random potential: results and puzzles**

**Thursday, 22 August 2013 (Room:Adriatico Guest House Kastler Lecture Hall)**

- 09:00 - 09:45**     **A. Pikovsky**  
**First and second sound in strongly nonlinear lattices**
- 09:45 - 10:30**     **M. Ivanchenko**  
**Extended two-particle boson states in quasiperiodic chains**
- 10:30 - 11:00**     --- Coffee break ---
- 11:00 - 11:30**     **D. Basko**  
**Contributed talk: Theory of non-linear diffusion in a weakly disordered anharmonic chain in the regime of strong chaos**
- 11:30 - 12:15**     **I.V. Lerner**  
**The role of duality in one-dimensional transport of interacting particles through a constriction**
- 12:15 - 12:30**     **S. Rodriguez**  
**Contributed talk: Thermalization and cooling of photonic/excitonic/plasmonic quasi-particles in a metallic nano-particle array: towards quantum condensation**

- 12:30 - 13:45** --- Lunch ---
- 14:00 - 14:30** **A.L. Chudnovskiy**  
**Contributed talk: Doublon relaxation in the Bose-Hubbard model**
- 14:30 - 15:00** **A. Mitra**  
**Contributed talk: Quench dynamics of the one-dimensional bosons in commensurate periodic potential: Prethermalization and thermalization**
- 15:00 - 15:30** --- Coffee break ---
- 15:30 - 16:00** **M. Vavilov**  
**Contributed talk: Full-counting statistics of photons emitted by double quantum dot strongly coupled to high-Q resonator**
- 16:00 - 16:30** **M. Ortuño**  
**Contributed talk: Numerical simulation of many-body localization**
- 16:30 - 19:30** **Poster session/Free time/Discussions**

**Friday, 23 August 2013** (Room:Adriatico Guest House Kastler Lecture Hall)

- 09:00 - 09:45** **P. Littlewood**  
**Polariton condensation and dynamics**
- 09:45 - 10:30** **J. Bloch**  
**Polariton condensates in photonic circuits**
- 10:30 - 11:00** --- Coffee break ---
- 11:00 - 11:45** **L. Ioffe**  
**TBA**
- 11:45 - 12:30** **G. Shlyapnikov**  
**Finite temperature one-dimensional bosons in disorder**
- 12:30 - 12:45** **Closing**