

**Workshop on**  
**Cold Atoms meet High Energy Physics**  
**ECT\* Trento (Italy) 22-25 June 2015**

Organizers : **Massimo Inguscio** (Lens Florence and INRIM Torino), **Guido Martinelli** (SISSA Trieste) and **Sandro Stringari** (Trento).

**PROGRAM**

**Monday 22 June**

8.30-9.30 Registration

9.30-9.40 **Wolfram Weise** (Director of ECT\*), *Welcome*

9.40-10.20 **Francesca Ferlaino** (Innsbruck), *Dipolar gases with ultracold atomic magnets*

10.20-11.00 **Andrea Cappelli** (Florence), *Field theory description of topological phases of matter*

11.00-11.30 Coffee-break

11.30-12.10 **Andrea Trombettoni** (SISSA Trieste), *Simulations of symmetry-locking and topological phases in ultracold fermionic mixtures*

12.10-12.35 **Shunji Tsuchiya** (Tohoku University), *Fano resonance through Higgs bound states in tunneling of Nambu-Goldstone modes*

12.35-14.30 Lunch

14.30-15.10 **Margarita García Pérez** (Madrid), *Crossing barriers: topological structures in Yang-Mills theories*

15.10-15.50 **Wilhelm Zwerger** (Munich), *Higgs-mode, asymptotic freedom and anomalies with ultracold atoms*

15.50-16.20 Coffee-break

16.20-17.00 **Gabriele Ferrari** (INO-CNR Trento), *Kibble-Zurek mechanism and spontaneous generation of quantum defects*

17.00-17.25 **Sebastiano Peotta** (Aalto), *Superfluidity in topologically nontrivial bands*

**Tuesday 23 June**

9.20-10.00 **Peter Zoller/Marcello Dalmonte** (Innsbruck), *Quantum simulations of lattice gauge theories with cold atoms in optical lattices*

10.00-10.40 **Leonardo Fallani** (Florence), *Extra dimensions, gauge fields and multicolor physics with ultracold fermions*

10.40-11.10 Coffee-break

11.10-11.50 **Luca Tagliacozzo** (ICFO Barcelona), *Classical and quantum Hamiltonian simulations of lattice gauge theories*

11.50-12.15 **Kenichi Kasamatsu** (Kinki University), *Cold atom simulation of U(1) lattice gauge-Higgs model*

12.15-12.40 **Daisuke Satow** (ECT\* Trento), *Fermionic Nambu-Goldstone mode and (quasi-) supersymmetry breaking at finite temperature in QCD and cold atoms*

12.40-14.30 Lunch

14.30-15.10 **Muneto Nitta** (Keio University), *Vortices in BEC and QCD*

15.10-15.35 **Lev Pitaevskii** (Trento), *Confinement of half vortices in quantum mixtures*

15.35-16.10 Coffee break

16.10-16.50 **Martin Zwierlein** (MIT Boston), *Strongly interacting Fermi gases of atoms and molecules*

### Wednesday 24 June

9.20-10.00 **Manuel Endres** (Harvard), *The Higgs amplitude mode at the two-dimensional superfluid/Mott insulator transition*

10.00-10.40 **Mikhail Baranov** (Innsbruck), *Majorana fermions in atomic-molecular systems at finite temperature and in the presence of noise*

10.40-11.10 Coffee-break

11.10-11.50 **Kenichi Konishi** (Pisa), *Monopole, vortex and confinement*

11.50-12.30 **Saverio Pascazio** (Bari), *Quantum simulations of QED beyond quantum link models*

12.30-14.30 Lunch

14.30 15.10 **Ettore Vicari** (Pisa), *Critical Phenomena in cold-atom systems*

15.10-15.35 **Minoru Eto** (Yamagata University), *Waltzing vortex molecules in two-component BECs*

15.35-16.10 Coffee break

16.10-16.50 **Simone Montangero** (Ulm), *Tensor networks simulations of real-time string-breaking*

16.50-17.30 **Erez Zohar** (MPI Munich), *Quantum simulations of lattice gauge theories using ultracold atoms*

### Thursday 25 June

9.20-10.00 **Christophe Salomon** (ENS Paris), *A Bose-Fermi superfluid mixture*

10.00-10.40 **Roberto Casalbuoni** (Florence), *QCD at high density and the LOFF phase*

10.40-11.10 Coffee break

11.10-11.50 **Augusto Smerzi** (Florence), *Breaking symmetries with ultracold atomic gases*

11.50-12.15 **Boris Krippa** (Nottingham), *Phase structure of imbalanced many-fermion systems*

12.15-14.15 Lunch

14.15-14.40 **Alessio Celi** (ICFO Barcelona), *Deconfining strong coupling phase in SU(2)-gauge magnets*

14.40-15.05 **Uwe Fischer** (Seoul), *Revealing single-trap condensate fragmentation*

15.05-15.30 Coffee break

15.30-16.10 **Roberto Balbinot** (Bologna), *Hawking radiation in black holes and BEC*

16.10-16.50 **Iacopo Carusotto** (INO-CNR Trento), *Analog gravity experiments in atomic BECs and fluids of light*