

# Quantum simulation of gravitational problems on condensed matter analog models

**Trento, 19- 23 June 2023**

This interdisciplinary workshop gathers specialists from theoretical and experimental condensed matter physics, quantum optics, quantum information, and from theoretical cosmology, gravitation and astrophysics. It is the 4th edition of a series of key events that have fostered the transition of analog models from being a scientific curiosity towards being a useful quantum simulation tool to experimentally explore new physics. Our specific goal is to stimulate interdisciplinary studies of condensed matter analog models of gravity as a concrete experimental tool to attack outstanding problems that arise in the context of gravitation, cosmology and astrophysics. The present challenge is to keep extending the range of configurations that can be simulated, and to identify the most important questions to be addressed. As a key novelty of our event, ample space will be devoted to the use of analog models to attack those quantum information issues that arise from black hole theory.

**On Wednesday 21st, the workshop will include a special event  
in memory of Renaud Parentani (1962-2020)**

## **Organizers**

Iacopo Carusotto (INO-CNR BEC Center, Italy), Roberto Balbinot (University of Bologna, Italy), Jacqueline Bloch (C2N CNRS, Palaiseau, France), Gabriele Ferrari (University of Trento, Italy), Massimiliano Rinaldi (University of Trento, Italy), Scott Robertson (Institut Pprime, Poitiers, France)

## **Invited Speakers**

David Bermudez (CINVESTAV, Mexico), Miles Blencowe (Dartmouth College, USA), \*Robert Brandenberger (McGill Univ. Montreal, Canada), Maria Chiara Braidotti (Univ. Glasgow, Scotland), Salvatore G. Butera (Univ. Glasgow, Scotland), Sandro Fabbri (Univ. Valencia, Spain), Daniele Faccio (Univ. Glasgow, Scotland), Uwe Fischer (Seoul National University, Korea), Ivette Fuentes (Univ. Southampton, UK), Bei-Lok Hu (Univ. Maryland, USA), Ted Jacobson (Univ. Maryland, USA), Maxime Jacquet (LKB, Paris, France), Friedrich Koenig (Univ. St. Andrews, Scotland), Ulf Leonhardt (Weizmann, Israel), Stefano Liberati (SISSA, Trieste, Italy), Massimo Mannarelli (Lab. Naz. Gran Sasso, Italy), Ian Moss (Univ. Newcastle, UK), Markus Oberthaler (Univ. Heidelberg, Germany), Paolo Pani (Univ. Sapienza, Roma, Italy), Alberto Parola (Univ. Insubria, Como, Italy), Nicolas Pavloff (LPTMS Orsay, France), Scott Robertson (Institut Pprime, Poitiers, France), Joerg Schmiedmayer (TU Wien, Austria), Dmitry Solnyshkov (Clermont-Ferrand, France), Jeff Steinhauer (Technion, Haifa, Israel), William Unruh (Univ. British Columbia, Canada), Silke Weinfurter (Univ. Nottingham, UK), Chris Westbrook (Institut d'Optique, Palaiseau, France).

\*To be confirmed

**Director of ECT\*: Professor Gert Aarts**

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