

# “Nonequilibrium phenomena in superfluid systems: atomic nuclei, liquid helium, ultracold gases, and neutron stars”

**12-16** MAY, 2025

**ECT\* Villa Tambosi, Villazzano**



**Organizers:** Brynmor Haskell  
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**Abstract:** The workshop aims to discuss and exchange results and ideas concerning the description of superfluid systems in nonequilibrium conditions. In particular, we would like to focus on fermionic superfluidity, treating bosonic superfluids as auxiliary systems. Thanks to advances in experimental techniques in the field of ultracold gases, we can now explore the BCS-BEC crossover and investigate nonequilibrium phenomena both in the BEC and BCS limits, pinning down differences. These phenomena involve the dynamics of vortices, dissipative flows, dynamics of solitonic excitations, stability of persistent currents or droplet collisions. We may also study the influence of inhomogeneous systems and/or supersolid phases on the behavior of the superflow or the vortex dynamics. On the other hand, superfluid dynamics is crucial for our understanding of other fermionic systems, such as atomic nuclei and neutron stars.

**ECT\* Director: Prof. Ubirajara van Kolck**

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