SRS
SwissMAP Research
Station in Les Diablerets

June 20 - June 25, 2021

Emergent theories for wave turbulence and particle dynamics

Organisers: Marcello Porta (SISSA, Trieste) & Chiara Saffirio (UNIBAS)

In the last years, there has been important progress in the mathematical understanding of effective theories for interacting quantum gases and classical fluids. Notable examples are Gross-Pitaevskii theory for Bose-Einstein condensates, and the Boltzmann equation for rarefied gases. With respect to the fundamental microscopic laws of motion, effective theories involve a much smaller number of degrees of freedom and are usually nonlinear, due to an averaging mechanism taking place at a mesoscopic/macroscopic scale. From the point of view of physics, the emergent nonlinearity is often responsible for interesting collective phenomena, turbulence in fluids being one of the most striking. The workshop will focus on the analysis of effective evolution equations for many particle systems, with a particular emphasis on the emergence of turbulence from nonlinear dynamics, and on the rigorous derivation of effective theories starting from the fundamental laws of microscopic motion.

Confirmed Speakers

Laurent Desvillettes (Université Paris Diderot)
Christian Hainzl (LMU Munich)
Zaher Hani (University of Michigan)
Mathieu Lewin (Université Paris Dauphine)
Jani Lukkarinen (University of Helsinki)
Alberto Maspero (SISSA, Trieste)
Riccardo Montalto (Università degli Studi di Milano)
Andrea Nahmod (University of Massachusetts Amherst)
Natasa Pavlovic (University of Texas Austin)
Benjamin Schlein (University of Zurich)
Robert Seiringer (IST Austria)
Sergio Simonella (ENS Lyon)
Herbert Spohn (TU Munich)
Gigliola Staffilani (MIT)

For registration see https://indi.to/waveturbulence or scan

More information on the SwissMAP Research Station at swissmaprs.ch

European Research Council
Established by the European Commission

Swiss National Science Foundation

SwissMAP
The Mathematics of Physics
National Centre of Competence in Research