ECT*
EUROPEAN CENTRE
FOR THEORETICAL STUDIES
IN NUCLEAR PHYSICS AND RELATED AREAS

FONDAZIONE
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Online Workshop

Relativistic Fermions in Flatland: theory and application

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Abstract

Planar fermions occur frequently in layered systems and are extensively studied in condensed matter physics; for instance, electronic properties of graphene have long beenunderstood in terms of relativistic fermions centered on Dirac points in momentum space,but the influence of interactions between charge-carrying degrees of freedom is less well-understood and remains an active field of study. Other examples are furnished by cuprate superconductors and materials with symmetry-protected topological phases. Quantum fermions in 2+1d also present many theoretical challenges, and there is a parallel renaissance of interest involving among others workers in large loop-order perturbation theory, functional renormalisation group, conformal bootstrap, and lattice simulation, toolsmainly developed for particle theory, for whose practitioners such systems encapsulate essential challenges for their respective agendas.

Keynote speakers

I. Affleck, S. Andergassen, f. Assaad, P. Buividovich, S. Catterall, S. Chandrasekharan, L. Janssen, N. Karthik, D. Litim, J. Maciejko, P. Marquard, V. Mastropietro, D. Poland, B. Roy, D. Schaich, M. Scherer, S. Sorella, A. Wipf, H. Yao, O. Zanusso

Organizers

H. **Gies** (Friedrich Schiller University Jena), J. **Gracey** (University of Liverpool), S. **Hands** (Swansea University), I. **Herbut** (Simon Fraser University)

Director of the ECT*: Professor Gert Aarts

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