Contribution ID: **78** Type: **Invited talk**

Driven-dissipative spinor superfluids: a compact Kardar-Parisi-Zhang dynamics of the phase

Wednesday 4 September 2024 09:00 (40 minutes)

Driven-dissipative quantum fluids can differ substantially from their equilibrium counterparts. The long-wavelength phase dynamics of a polariton/photon condensate has been shown to obey Kardar-Parisi-Zhang (KPZ) equation. Since the phase is a compact variable, vortices in 2D and phase slips in 1D can proliferate destroying the KPZ scaling. The interplay between KPZ physics and topological defects is currently subject of great interest, especially in polariton context [1,2,3]. Here, we consider multicomponent system relevant to polariton condensate with different polarisations. The effective theory for Z2 degenerate coupled condensates with U(1)xU(1) symmetries maps onto coupled multicomponent KPZ equations. We perform dynamical renormalisation group analysis as well as exact numerical simulations to place polariton condensates in the subspace of a generally rich flow diagram.

Career stage

Relevant publications (optional)

Short bio (50 words) or link to website

References

[1] A. Ferrier, A. Zamora, G. Dagvadorj, and M.H. Szymańska Phys. Rev. B 105, 205301 (2022);
[2] A. Zamora, N. Lad, and M. H. Szymanska Phys. Rev. Lett. 125, 265701 (2020);
[3] A. Zamora, L. M. Sieberer, K. Dunnett, S. Diehl, and M. H. Szymańska Phys. Rev. X 7, 041006 (2017);
[4] H. Weinberger, P. Comaron and M. Szymanska "Multicomponent KPZ in Degenerate Coupled Condensate" in preparation.

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