Seminar/Talk

Anomalous condensate fluctuations in scalar active matter with a diffusivity edge

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Host: Carl Goodrich

Continuum models of scalar active matter with an effective diffusivity vanishing above a given density, i.e. a diffusivity edge, have previously been shown to undergo a condensation transition akin to that of Bose-Einstein when confined in a stable potential [1,2,3,4]. Here, we explore the effect of stochasticity on the nature of this phase transition, as well as the ensuing dynamic features of the ground state occupation. Though systematic numerical experiments, we uncover the existence of anomalously large fluctuations of the condensate density, characterised by non-trivial exponents in the condensation phase. For a particular class of scalar models satisfying an effective fluctuation-dissipation theorem, our results are validated by an exact mapping to a microscopic zero-range process.1. R. Golestanian, Phys. Rev. E 100, 010601(R) (2019)2. B. Mahault and R. Golestanian, New J. Phys. 22, 063045 (2020)3. F. Meng, D. Matsunaga, B. Mahault and R. Golestanian, Phys. Rev. Lett. 126, 078001 (2021)4. J. Berx, A. Bose, R. Golestanian and B. Mahault, Euro. Phys. Lett. 142, 67004 (2023)

Wednesday, May 14, 2025 10:30am - 12:00pm

Sunstone Bldg / Ground floor / Big Seminar Room A / 27 seats (I23.EG.102)

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