



Physical Sciences Seminar

Quantum seminar with Piotr Tadeusz Grochowski

Piotr Tadeusz Grochowski (Center for Theoretical Physics Warsaw)

Host: Maksym Serbyn

We employ time-dependent density functional theory and atomic orbital approach to study dynamics of binary, repulsive quantum gases undergoing a phase separation [1,2]. With our methods, we reproduce recent experimental data in both Fermi-Fermi [3] and Bose-Fermi mixtures [4]. By combining classical fields description of bosons and hydrodynamic model of fermions, we provide a reliable framework which allows us to investigate a finite temperature dynamics of a BEC immersed in a polarized Fermi gas. As an additional treat, an aesthetically appealing result will be presented – the fermionic quantum carpet [5,6].

[1] Trappe et al., Phys. Rev. A 93, 023612 (2016) [2] Karpiuk et al., SciPost Phys. 8, 066 (2020) [3] Grochowski et al., Phys. Rev. Lett. 119, 215303 (2017) [4] Grochowski et al., Phys. Rev. Lett. 125, 103401 (2020) [5] Grochowski et al., Phys. Rev. Research 2, 013119 (2020) [6] ebek et al., arXiv:2011.04582

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Wednesday, March 24, 2021 03:00pm - 04:00pm

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