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Superfluidity in Bilayers of Dipolar Fermions

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Abstract:

Ultra-cold systems are unique platforms for testing and simulating condensed matter theories. Polar molecules and magnetic atoms with long-range dipolar interactions provide better correspondence with electronic systems. In this talk, I will discuss competition between different orders in double layer systems of dipolar fermions. I will show how superfluid pairing and/or density modulated phases can emerge in different setups of these bilayers. Finally, the instabilities toward exotic superfluid phases in density imbalanced systems of dipolar bilayers will be discussed.

References:

- 1) A. Mazloom and Saeed H. Abedinpour, "Interplay of interlayer pairing and many-body screening in a bilayer of dipolar fermions", arXiv: 1710.10448.
- 2) E. Akaturk, Saeed H. Abedinpour, and B. Tanatar "Density-wave instability and collective modes in a bilayer system of antiparallel dipoles", J. Phys. Commun. 2, 015018 (2018).
- 3) A. Mazloom and Saeed H. Abedinpour, "Superfluidity in density imbalanced bilayers of dipolar fermions", Phys. Rev. B 96, 064513 (2017).