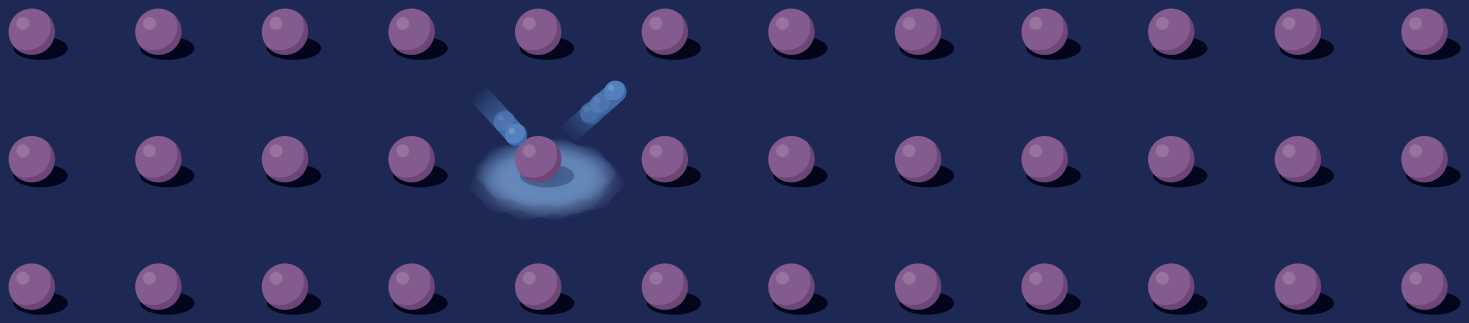

ONLINE SEMINAR SERIES

DMFT-QE Online Symposium

Monday, November 3, 2025
9:30 a.m. – 11:00 a.m. ET

Zoom Meeting
(not to be shared publicly)
ID: 952 8011 6170
Password: 365088

Contact: Paula Lukats
plukats@flatironinstitute.org

FLATIRON INSTITUTE

Talk 1 : Analogies between classical and electronic fluids: Widom and Frenkel lines with applications to the Hubbard model

André-Marie Treblay, University of Sherbrooke

Many concepts of statistical physics have surprisingly wide applicability, from simple fluids to QCD. In this talk, I will discuss crossovers that appear above first-order transitions that end at a critical endpoint. In classical fluids, the first-order transition I consider is the liquid-gas transition and the crossovers are defined by the Widom line for thermodynamic quantities and by the Frenkel line for dynamical ones. I will present results for the electronic fluid obtained from cluster extensions of dynamical mean-field theory for the Hubbard model. The first-order transitions are the Mott transition at half-filling and the Sordi transition at finite doping. I will discuss the relevance of these concepts to cuprates and layered organics.

Talk 2 : Correlation Enhanced Electron-Phonon Coupling in FeSe/SrTiO3 at a Magic Anglen

Subhasish Mandal, West Virginia University

Electron–phonon coupling (EPC) is a fundamental quantity in many-body physics, governing diverse material properties and phenomena. Its intricate interplay with strongly correlated electrons remains a central topic of investigation in Fe-based superconductors, where a predictive theory for unconventional superconductivity is still lacking. Building on this understanding, controlling the superconducting transition temperature (Tc) through atomic-scale structural engineering and its connection to strong electronic correlations offers a promising pathway toward high-Tc materials. Here, by combining first-principles embedded dynamical mean-field theory calculations with epitaxial growth of single-layer FeX (X = Se, S, Te) on a $SrTiO_3$ (001) substrate, which enables controlled distortion of the FeX_4 tetrahedron, we uncover a distinct superconducting dome where the superconducting gap reaches its maximum at a 'magic' angle of the FeX_4 tetrahedron and the EPC for the A1g phonon mode is maximized for the FeSe film. Our findings reveal a significant role of electronic correlations in strengthening Cooper pairing in unconventional superconductors by enhancing EPC.