



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

M. E. Taylor Analysis and PDE Seminar

Wednesday, August 28th
3:30 - 4:30 p.m.
Phillips Hall 385

On the quest for superconductivity in TBG

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Abstract. Conventional superconductivity emerges for weakly interacting Fermi gases, and its emergence has been studied in mathematical physics. Such conventional superconductors, however, have a very low critical temperature, making them very expensive in applications. Unconventional superconductors, such as cuprates, on the other hand exhibit a very high critical temperature, but we have very little understanding of the comprising mechanism. Surprisingly, a relatively simple material, namely twisted bilayer graphene (TBG) at a relative twist of 1.1° , the magic angle, has been shown to exhibit superconductivity at a very high temperature, compared with the electron density. Understanding superconductivity in TBG could provide us with insights into more general unconventional superconductors. One element that makes conventional superconductivity possible is the modification of the electron-electron interaction to become attractive due to the inclusion of scattering with an ionic background. In my talk, we will study how to rigorously access this scattering. In particular, we develop a mathematical framework that allows us to study phonons in incommensurate 2D materials.