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Title: Flat-band superconductivity

Recent research on quantum matter shows the possibility of engineering the electronic dispersion. One of the interesting directions is the attempt to create flat electronic bands, because the large density of states in such systems promotes electronic correlated states such as magnetism or superconductivity. I will focus in my lecture on the quest to increase the critical temperature of superconductors with such flat bands and show how the conventional theory of superconductivity has to be altered when pairing extends across entire bands. Using graphene-based systems as examples, I will discuss different forms of such flat-band superconductivity produced by topology, position dependent strain or twisted multilayers. If time allows, I will also discuss the role of the valley degree of freedom in the superconducting pairing and how it may assist creating spin triplet superconducting phases.