

Abstract Submitted
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Graphene two-leg ladder. A system with conducting, insulating and superconductive properties GEORGE KARAKONSTANTAKIS, STEVEN KIVELSON, Stanford University — We use DMRG to study the ground-state phases of the Hubbard model defined on a one dimensional ladder of edge-sharing hexagons - a model which may be relevant to the electronic structure of polyacenes or graphene strips. At half filling we find a robust insulating phase with a large spin-gap, even at small U/t which, as a function of the strength of the third-neighbor hopping, exhibits a non-trivial cross-over from a band -insulator to a Mott insulator. The doped system exhibits a variety of conducting phases. Possible relevance of our results to the recently discovered high temperature superconductivity in K doped dibenzpentacene will be discussed, as well.

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