



## Edge magnetization in chiral graphene nanoribbons and quantum anomalous Hall effect interfaces in graphene

By André Ricardo Carvalho

GRIN Verlag Feb 2016, 2016. Taschenbuch. Condition: Neu. Neuware - Doctoral Thesis / Dissertation from the year 2015 in the subject Physics - Other, , course: Graphene, language: English, abstract: This thesis is composed of two theoretical studies related to properties of edge states in nanostructures of graphene monolayers. In the first one, we analyze the magnetic properties of chiral graphene nanoribbons. Chiral edges corresponds to a symmetry property whose mirror image cannot be superposed on to the original one, inversely of an achiral. There are only two cases of achiral nanoribbon: armchair or zigzag edges. Chiral graphene nanoribbons, as well as those with zigzag edges, have localized states that favour to edge magnetization. In our analysis we use the tight-binding (TB) model with an electron-electron Hubbard mean-field interaction term. We show that only the standard tight-binding model with nearest-neighbor hopping is not sufficient to describe the low-energy and magnetic properties of graphene nanoribbons, i.e., the inclusion of next-nearest-neighbor hopping terms is necessary for an accurate modeling. We compare the results from our model with recent data from scanning tunneling spectroscopy and propose a new interpretation for the peaks experimentally observed in the local density of states. The second subject...



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