During this talk, I will present several results we got over the past few years on graphene. Focus has mainly been aimed at how to functionalize this 2D material. This functionalization allows us to tailor the properties to be suitable for each application particular needs. In one of the works, we looked at the interaction of hydrogen with the material to check if we could predict specific magnetoresistive transport signals indicating coupling between magnetic moments. Nowadays, many chemists are looking into this specific functionalization, as it could be very interesting to use graphene for hydrogen storage in batteries. From this point of view, it is important to well understand the more fundamental properties of the interaction between hydrogen and graphene. Our research also looks into the alteration of pristine graphene's transport properties due to other kinds of disorder, such as oxygen atoms. Both the zero field limit as well as finite magnetic fields are included in the calculations. The primary tool to do so has been the Kubo Greenwood formalism in real space implementation. The tight-binding approach based on ab initio material parameters allows us to probe mesoscopic samples of experimental size.
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Short CV:

Mr. Leconte graduated from the Ecole Polytechnique de Louvain (EPL) and Universite Catholique de Louvain (UCL), Belgium with a Master in Applied Physics Engineering. He was on an internship at Fudan University in Prof. Xin Gao Gong’s group and is now Teaching Assistant and PhD candidate at UCL.