

**SEMINAIRE DMONS/DSI**

**Mardi 27 février 2024 à 11h00 à  
l'auditorium de l'IPCMS**

**Maria CHATZIELEFTHERIOU**

*CPHT, École Polytechnique, Palaiseau*

**Evolution of the electronic spectral function in the  
weak-to-strong coupling regime of the Hubbard  
model**

I will discuss effects of non-local fluctuations on correlated electronic systems and in particular on the physics of the Hubbard model. In the first part of the talk I will present results of a recent work [1], where using non-perturbative many-body techniques that are able to interpolate between the spin-fluctuation-dominated Slater regime at weak coupling and the Mott insulator at strong-coupling, we disentangle the effects of antiferromagnetic fluctuations and local electronic correlations in the formation of an insulating state. This allows us to identify the Slater and Heisenberg regimes in the phase diagram, which are separated by a crossover region of competing spatial and local electronic correlations. This bridging of the two limits had been a key missing ingredient to our understanding of metal-insulator transitions in real materials. In the second part of the talk I will present a non-local description of Hubbard bands and Green's function zeros of Mott insulators. Their momentum dispersion has been found to be crucial in order to address the topological classification of strongly interacting insulators, a very intensively debated subject. Our analytical result offers a general and accurate description of the Hubbard bands and Green's function zeros, establishing a one-to-one connection between their respective momentum dispersions.

[1] M.Chatzieleftheriou, S. Biermann, E. A. Stepanov, arXiv:2312.03123 (2023)