PMQ31 "Interactions, topology and symmetry in disordered systems "

Thématiques : condensed matter physics, cold atoms, optics

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Experimental and theoretical advances in atomic physics and optics have been made for nearly two decades to get a better understanding of disordered systems and their manisfestations, originated from condensed matter physics, as the celebrated Anderson localization. Furthermore, a significative scientific effort has been recently realized to describe puzzling phenomena in the presence of disorder with an other key ingredient : interactions (Many-Body Localization with cold atoms) [1], collective effects with light [2], topology [3], symmetry breaking [4] (with artificial gauge fields).

These topics are now intensively studied in different communities (condensed matter, cold atoms, optics) at a French national scale in a very competitive international context. The general aim of this mini-colloquium is to bring together researchers from different fields of physics which study thoses various disordered systems, to explore perspectives proposed by the interplay between disorder and interactions/topology/symmetry.
This will offer the opportunity to discuss recent results, share the knowledge in this subject and possibly initiate new collaborations. Experimental, theoretical and numerical contributions from atomic physics, optics and condensed matter physics are welcome in this mini-colloquium.

Références :
[1] Many-body localization : an introduction and selected topics, F. Alet, N. Laflorencie, Comptes Rendus Physique (2018)
[2] Microscopic and Macroscopic Signatures of 3D Anderson Localization of Light, F. Cottier et al., Phys. Rev. Lett. 123, 083401 (2019)
[3] Measuring the Chern number of Hofstadter bands with ultracoldbosonic atoms, M. Aidelsburger et al,Nat. Phys. 11, 162–166 (2015)
[4] Controlling symmetry and localization with an artificial gauge field in a disordered quantum system, C. Hainaut et al., Nature Communications 9, 1382 (2018)