
Cold atoms in optical lattices and the physics of strong quantum correlations

Antoine Georges*¹

¹Collège de France (CDF) – Collège de France – 11 place Marcelin Berthelot F-75231 Paris Cedex 05, France

Résumé

”Artificial crystals” made of ultra-cold atoms trapped by laser beams can be engineered with a remarkable level of controllability, and allow for the study of quantum physics in previously unexplored regimes, hence opening up new frontiers between condensed matter physics and quantum optics. I will review various aspects of this field, including the trapping, cooling and probing of fermionic atoms into the Mott and Néel states. I will also address recent theoretical and experimental studies of transport in such systems.

*Intervenant