

CESQ Colloquium

Tuesday March 31 @ 3 PM

Seminar Room, Centre Européen de Sciences Quantiques,
Campus de Cronenbourg

Sylvain Nascimbène

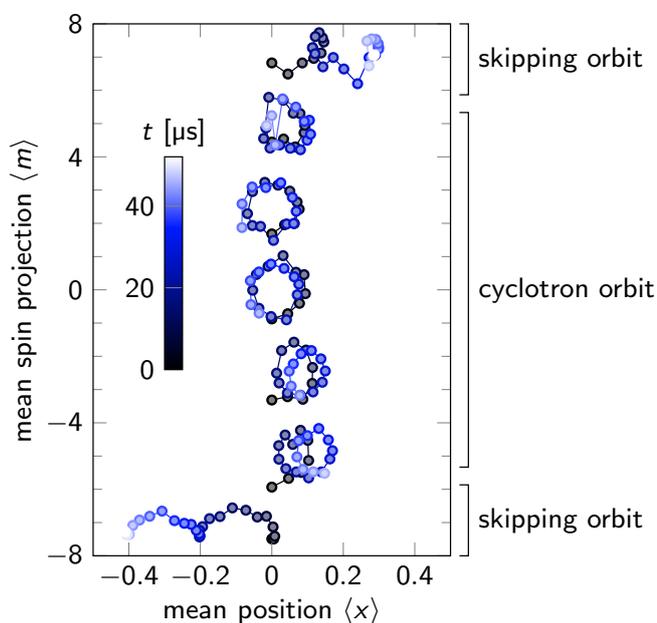
Ecole Normale Supérieure et Collège de France

Exploring quantum Hall physics with ultracold dysprosium atoms

This talk presents the realization of a synthetic quantum Hall platform based on ultracold dysprosium atoms, where one real spatial dimension is coupled to a synthetic dimension formed by the atom's internal spin states. Raman-induced

spin-orbit coupling generates a uniform artificial magnetic field and enables the emergence of Landau-level physics.

I will show different manifestations of this effective magnetic field, including chiral edge motion and a quantized Hall response. I will then discuss the study of a topological phase transition driven by competition between Raman and Bragg couplings. At the critical point, we observe robust half-quantization, and connect it to a Dirac band touching and parity anomaly.



Contact: Jérôme Dubail (j.dubail@unistra.fr), Tom Bienaimé (t.bienaimé@unistra.fr)