Post-Doctoral position in Ultracold Quantum Matter Theory
Center for Theoretical Physics, Ecole Polytechnique

The *Ultracold Quantum Matter* theory group lead by Prof. Laurent Sanchez-Palencia at the Center for Theoretical Physics in Ecole Polytechnique (France, Paris region) invites applications for a **postdoctoral position on the theory of ultracold quantum matter**. The position is for two years, with possible extension, starting any time in 2027.

Research at the Ultracold Quantum Matter group

The group conducts cutting-edge theoretical research on ultracold quantum gases, quantum simulation, and quantum information theory in correlated quantum matter. In recent years, the group has made pioneering contributions on the **quantum simulation of bosonic quasicrystals**, including studies of localization and fractality [Yao *et al.*, PRL 2019], Bose-glass physics in 1D quasiperiodic [Yao *et al.*, PRL 2020] and disordered [Morpurgo *et al.*, PRL 2026] systems, 2D quasicrystals [Gautier *et al.*, PRL 2021; Zhu *et al.*, PRL 2023], and twisted moiré systems [Johnstone *et al.* PRR Letter (2024)]. On the other hand, we develop research on **quantum information theory applied to many-body quantum systems** and out-of-quilibrium dynamics of correlated quantum matter, with recent contributions to information spreading in systems with long-range interactions [Cevolani *et al.*, PRB 2018; Schneider *et al.*, PRR 2021], quantum quench spectroscopy [Villa *et al.*, PRA 2019; PRA 2020; PRA 2021, Yu *et al.*, arXiv:2608.05241], as well as entanglement entropy and modular Hamiltonians [Schneider *et al.*, PRB 2022]. Further information may be found on the group webpage.

Research profile

The hired post-doctoral researcher is expected to develop a research programme in one of these topics, co-supervise Master and/or PhD students, and participate actively to the team work. We look for candidates with up to five-year experience after PhD. Strong education in Theoretical Physics and successful research experience in the physics of correlated quantum systems and/or quantum information theory is expected. Expertise in advanced numerical techniques, such as tensor network approaches or quantum Monte Carlo, will be highly appreciated. Strong personal motivation, abilities to work in team and guide students, as well as strong communication skills are expected.

Application procedure

Applications should be sent to Prof. Laurent SANCHEZ-PALENCIA (lsp@cpht.polytechnique.fr). The application documents must include a Curriculum Vitae (with date of birth, e-mail address, complete academic and professional carrer), academic certificates, a complete publication list, a concise research statement, and two reference letters (to be sent independently by the recommenders).

Dates

Interested applicants are advised to send their application at their earliest convenience. The offer will remain open until the position is attributed.