



INSTITUT
POLYTECHNIQUE
DE PARIS

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 in autumn 2025.

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 systems [[Yao et al., PRL 2020](#)], 2D quasicrystals [[Gautier et al., PRL 2021](#); [Zhu et al., PRL 2023](#)], and twisted moiré systems [[Johnstone et al. \(2024\)](#)]. On the other hand, we develop research on **quantum information theory applied to many-body quantum systems** and out-of-equilibrium 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](#)], 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 should include a Curriculum Vitae (with date of birth, e-mail address, complete academic and professional career), academic certificates, a complete publication list, a concise research statement, and two reference letters.

Dates

Deadline for application : January 5, 2022

Decision : end of March 2025

Expected starting date : September/October 2025 (may be adapted)