

## Proposition d'un Projet de Recherche en Laboratoire

**Titre :** Theoretical Physics applied to Many-Body Physics and Quantum Information

**Laboratoire d'accueil :** Centre de Physique Theorique, CPHT, Ecole Polytechnique

**Résumé :** Our research is in theoretical physics related to interdisciplinary research areas with various applications in quantum physics, many-body physics and condensed-matter, quantum information.

We also address new areas at the frontiers between topological phases, light-matter interaction, transport and "quantum energy" applications through interaction effects.

See: [https://www.cpht.polytechnique.fr/cpht/lehur/Karyn\\_LeHur.html](https://www.cpht.polytechnique.fr/cpht/lehur/Karyn_LeHur.html).

On this page, you can also find 4 on-going lectures, June 2023, on quantum physics and geometry, Paris-Saclay Series Lectures at Institut d'Optique.

The particular topic research can be discussed in accordance with the student, myself and other members in the group. Interested candidates can send an e-mail, short motivation letter and CV (with grades/courses). Thanks.

The 2 previous students from Ecole Polytechnique, who did a PRL PHY513 in our team, did very well: Felicien Appas (<https://journals.aps.org/prb/abstract/10.1103/PhysRevB.97.04110>) and Joshua Benabou who is now in Berkeley as a PhD student in astrophysics. Therefore, I will be glad guiding a new student Fall 2023-2024.

**Mots clés :** Introduction to Theoretical Physics, Fundamental Questions applied to many-body systems, condensed-matter systems, quantum physics and quantum information, AMO systems and nano-electronics. Our research is also directed related to applications and experimental realizations.

**Nature :** (Expérimental, théorique, numérique) Theoretical and Numerical

**Accueil d'un binôme possible :** Oui/Non

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