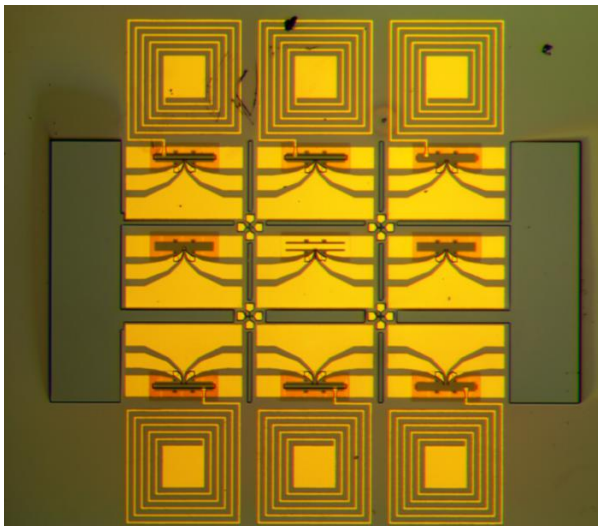


Open positions

Charge and spin dynamics in topological edge states

Positions for PhD student and a post-doc are available in the Mesoscopic Physics group at the Laboratoire de Physique de l'ENS, Paris, in which we investigate quantum transport phenomena in low dimensional nanostructures.



HgTe GHz resonators fabricated in the team

In recent years, a new class of materials called topological insulators has emerged, with spectacular properties inherited from the topological properties of their band structures. Electron transport occurs in these materials via boundary spin-polarized conducting states while the bulk remains insulating. In two-dimensions, the quantum spin Hall and quantum anomalous effects (with edge states at zero magnetic field) fall in this category. The extraordinary properties of these materials have opened prospects for novel spintronics devices without ferromagnets, and appear as a promising candidate platform for topological quantum computation.

The purpose of the project is to explore the dynamics of topological edge states, in the normal regime or in proximity with a superconductor. Our investigations will combine standard low-frequency measurements with microwave techniques, which offer a very powerful toolbox to explore topological matter.

The implementation of this project is supported

by an ERC Starting Grant, a SIRTEQ grant. A collaboration with the Molenkamp group (University of Würzburg) gives access to HgTe quantum wells, a system that has offered clear and diverse signatures of topological transport.

The Mesoscopic Physics group of LPENS has, over 20 years, developed an expertise in quantum electrical transport in nano-devices. The group has in particular focused on dynamical transport at the nano-second scale, in combination with noise and current correlation techniques.

- For a PhD student position, the candidate should have a Masters in Physics, with major in Quantum Physics or Condensed Matter Physics. Experience in cryogenic systems, transport measurements, and nano-fabrication technology are appreciated.
- For a post-doc position, the candidate should have a PhD in physics and if possible be experienced with GHz methods, cryogenic systems, transport measurements, and nano-fabrication technology.

Candidates should e-mail a letter of application to E. Bocquillon (erwann.bocquillon@ens.fr), together with a brief CV.