

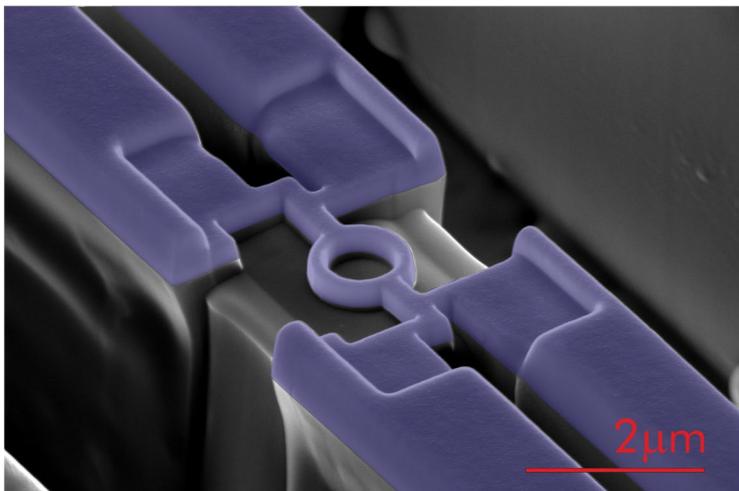
## Join our team – open PhD positions

Quantum mechanics lives from both the intrinsic dynamics as well as the boundary conditions. We explore how strongly correlated and/or topological electronic states appearing in a single crystal are altered if the size and shape of that crystal is controlled on the micron scale. Another key aspect is to build prototype devices on silicon chips to explore the novel electronic applications.

**Projects:** Strong electronic correlations can lead to a variety of collective ground states, such as superconductivity, charge-density-waves, orbital-selective ordering, and many more. To understand these ground states and their possibly interplay better, the PhD student will fabricate microstructures from single crystals and characterize their quantum state by thermal transport or tune the symmetry by the application of precise strain fields. A focus will be on high-temperature (cuprates, pnictides) and unconventional low-temperature superconductors ( $\text{Sr}_2\text{RuO}_4$ , heavy fermions). The projects will involve worldwide collaborations and joint experiments at high magnetic field facilities.

**Who we are:** Our group investigates how the electronic properties of quantum materials behave on sub-micron length scales. By Focused Ion Beam (FIB) machining we fabricate microstructures of highest crystalline quality on the  $>10\mu\text{m}$ -100nm scale. Here at EPFL, we have access to state-of-the-art nanofabrication including laser and electron beam lithography, as well as Focused Ion Beam machining. Access to extreme pulsed magnetic fields at a variety of high field laboratories (USA, Germany, Netherlands, France, China), provides the opportunity to build an international research network and gain broad experience in the field.

**Student Profile:** Candidates should have a strong background in condensed matter physics, a broad interest for new materials. The ability to work and structure a research project independently is important, in particular during the high field experiments. The candidate should bring the ambition and motivation to work in an energetic young research group. Skills in Labview, Matlab and CAD drawings are important.



We are looking forward to your application!

*This single crystal microstructure was machined from a macroscopic sample of the heavy-fermion superconductor  $\text{CeCoIn}_5$ .*

For more information about our group, please visit us at [www.epfl.ch/labs/qmat/](http://www.epfl.ch/labs/qmat/).