“Fiber Fabry-Pérot microcavities and their applications” by Prof. Jakob Reichel, Sorbonne University, Laboratory Kastler Brossel, ENS

Atom-Photon interaction is at the heart of quantum science, but also enables technologies ranging from lasers to trace gas detectors. With the advent of quantum technologies, the last few years have brought an explosion of interest in optical microcavities which enhance this interaction, enabling previously inaccessible applications to be explored. Fiber Fabry-Perot cavities (FFPs) with laser-machined, ultralow roughness micromirrors are one rather successful microcavity type. Since their first demonstration in our group a decade ago, they have found a wide and increasing range of applications in quantum technologies and beyond. They have been adopted by dozens of research laboratories, combined with quantum emitters ranging from ultracold atoms to diamond NV centers and carbon nanotubes, and used to realize single-photon sources, miniature Raman spectrometers, and even a new form of scanning probe microscopy. I will give an overview of this cavity technology and its latest developments, and highlight some of its applications, including a quantum enhancement technique for compact atomic clocks.