**Master thesis on superconducting cavity nanoelectromechanics in EPFL**

There is one vacancy open in Professor Kippenberg's group in École polytechnique fédérale de Lausanne (EPFL), in cooperation with Prof. Gross’ group in Walther-Meißner-Institute. For more information about the group, please refer to our group website (http://k-lab.epfl.ch/).

Cavity nanoelectromechanical systems realize parametric coupling of an electromagnetic resonance to a mechanical mode, which enables a wide range of phenomena including displacement measurements, sideband cooling or amplification of mechanical motion. Electromechanical coupling of superconducting microwave cavities and nano- or micro-mechanical oscillators (SEM image in Fig.1) provides novel, mechanically mediated functionality for the processing of microwave signals [1]-[3]. The measurement of the motion can be carried out at temperature of 30mK by measuring the phase of the transmitted microwave signal via homodyne detection.

We propose a master thesis work for a student motivated nanofabrication, low temperature physics. The aims of this thesis work are:

- To assist the sample preparations. The nanofabrication is carried out in the cleanroom (http://cmi.epfl.ch), which supports a broad range of nanoscale science and technology projects.
- To assist the setup of a dilution refrigerator and carry out low temperature measurement

Depending on the own interests and skills of the student, special emphasize can be put on the improvement of procedures to prepare samples, the commission of a dilution fridge with workshop coordination for low temperature nanomechanical measurement.

EPFL (in German Eidgenössische Technische Hochschule Lausanne) together with ETH Zürich are two Swiss federal institutes with high reputation international wide. EPFL is located directly besides the Geneva Lake, next to Alps and attractive landscapes. It is in the French speaking region of Switzerland, between Geneva and Montreux. For who likes doing interesting research and enjoying experiencing a foreign country, please do not hesitate to contact me with email tobias.kippenberg@epfl.ch or on phone +41216934428.