Objective of the project

The MEMS (micro-electromechanical system) and NEMS (nano-electromechanical system) are the most promising sensing devices. They are smaller than human hair thickness are can measure very small masses, forces and detect dangerous substances. There is a question – how to fabricate that small device?? You need just to put silicon substrate to FIB (Focused Ion Beam) microscope, paint your structure and after that put it in to vessel with etching solution. Voilà! Your NEMS is ready to use.

But there is a small movement of these devices, about 1 nm. That is a distance between atoms scale. How to measure that small movement? We are going to use piezoresistive properties of NEMS devices. We are going to check how the piezoresistive signal of the NEMS device depends on the layout.

Research to be carried out

In the FabMetNEMS project we will show how to design, fabricate and measure NEMS devices fabricated without sophisticated technologies like e-beam lithography or dry plasma etching. We will investigate the piezoresistve properties of doped silicon.

Reason for the research topic

The research on NEMS devices is giving access to novel nonlinear physics and unable us to measure new scale of physical quantities. The development of method for easy NEMS prototyping and measurement of their properties is giving new possibilities for standard laboratories.