**Summary**

The objective of the course is to expose PhD students to experimental measurement techniques and principles applied in front end research of condensed matter and nanophysics. Besides providing a solid background, it will focus on the crucial details which will make cutting edge experiments work.

**Content**

- Introduction
- Solids at the nanoscale
- Nanostructure fabrication: physical and chemical methods
- Matter at low temperatures, ultrahigh vacuum, low signal amplification
- Actuators and transducers as experimental tools
- Electronic transport
- Microscopy with atomic resolution: from electron microscopy to scanning probes
- Optics at the nanoscale
- Excitation spectroscopy: from electron spectroscopy to synchrotron based approaches