Low temperature laboratory

(experimental research in extreme conditions at very low temperatures)
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Heat capacity in temperature range 0.3-350 K

- in **PPMS** equipment (Quantum Design)
- He3 insert to receive temperatures down to 0.3 K
- new calorimeter – **He3 puck No. 935**
- **magnetic field 0-9 T**
- sample mass up to 10 mg
- high pressure cell HPC-33 up to **3 GPa**

Magnetization in temperature range 0.5-350 K

- in **MPMS** equipment (Quantum Design)
- new **He3 insert** to receive temp. down to 0.3 K
- **magnetic field 0-5 T**
- new high pressure **diamond anvil cell - Mcell Ultra** (EasyLab) up to **10 GPa**

Vacuum and image technique

- new combined mobile pumping set up with **turbomolecular** and oil rotary **pump** **HiCube 300 Clasic**/Duo 5M/Pfeiffer Vacuum:
  - for evacuation of vacuum spaces and distributions
  - flow rate of 260 l/s (turbo) @ 5 m^3/hour. (rotary)
  - final pressure $1x10^{-7}$ mbar
- **turbomolecular air-cooling pump** **HiPace 700 M**/Pfeiffer Vacuum:
  - for increasing of mixture circulation rate in ^{3}He-^{4}He refrigerator
  - flow rate of 600 l/s for helium
  - final pressure $1x10^{-7}$ mbar
- **optical stereomicroscope with digital camera STEMI 2000 C**/Carl Zeiss:
  - zoom 10x-80x
  - LED lighting
  - digital camera AxiCam, 5 Mpixls, USB, SD card, software

SQUID-based noise thermometer

- for temperature measurement and calibration of thermometers in new „cryogen-free“ ^{3}He-^{4}He refrigerator
- **Magnicon MFFT noise thermometer**, 16-bit digital to analog converter
- temperature range from 1mK to 1 K, typical power dissipation of about 100 pW
- LabView based TempViewer software, USB connection for SQUID electronics