Low Temperature Detectors

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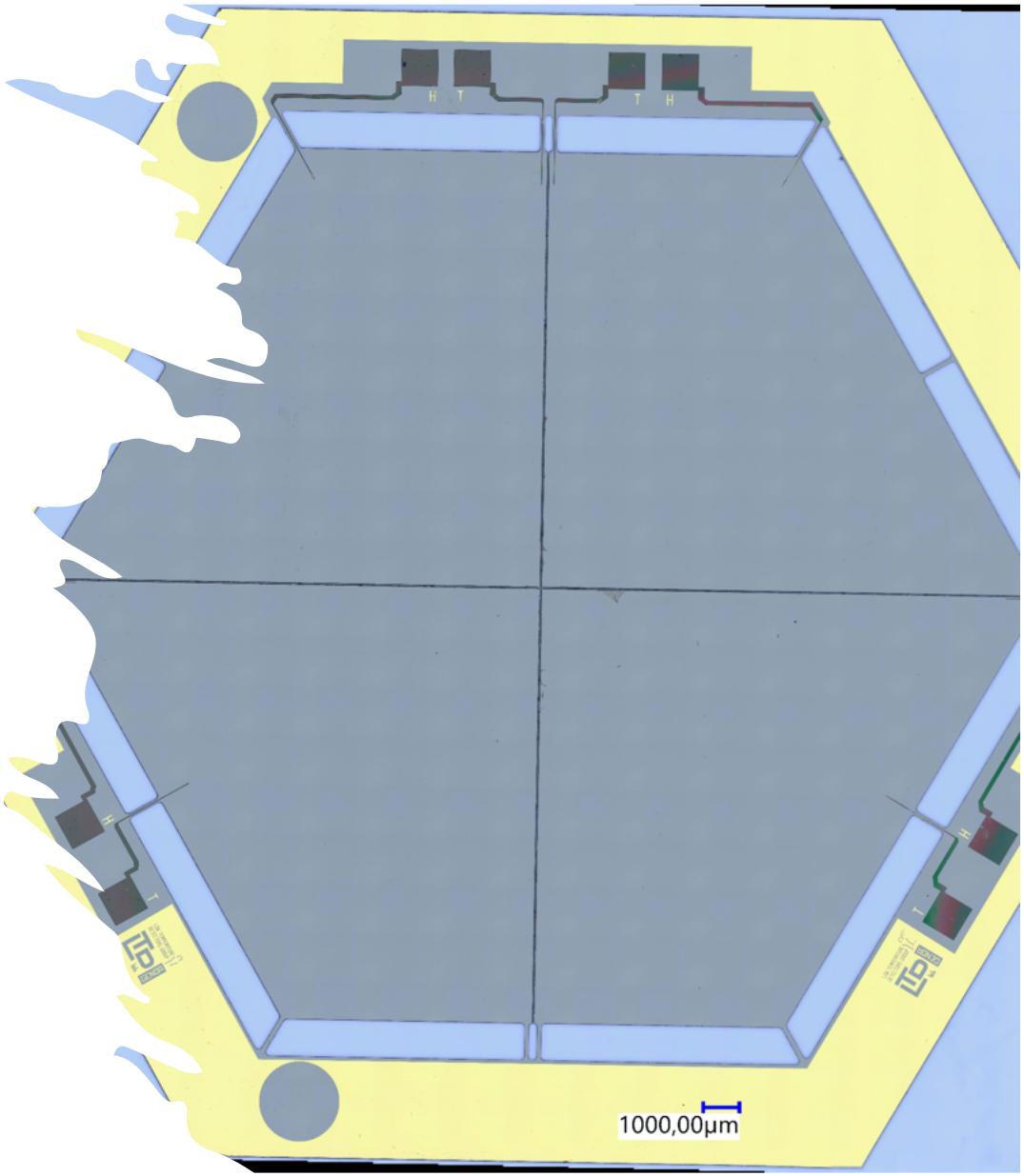
Overview

- LTDs are becoming the choice for various experiments (neutrino physics, direct dark matter search, CMB cosmology -inflaton... CSN2), and astrophysics projects from space, quantum data transmission technology projects (quantum cryptography, optical links at planetary distances
- LTDs are flexible instruments suitable for detecting particles and photons over a wide energy spectrum: GeV particles down to IR single photons
- LTDs requires knowledges in multi-disciplinary technologies: low temperatures phys. and tech., low temp electronics and superconductivity, …

Activity of the Group

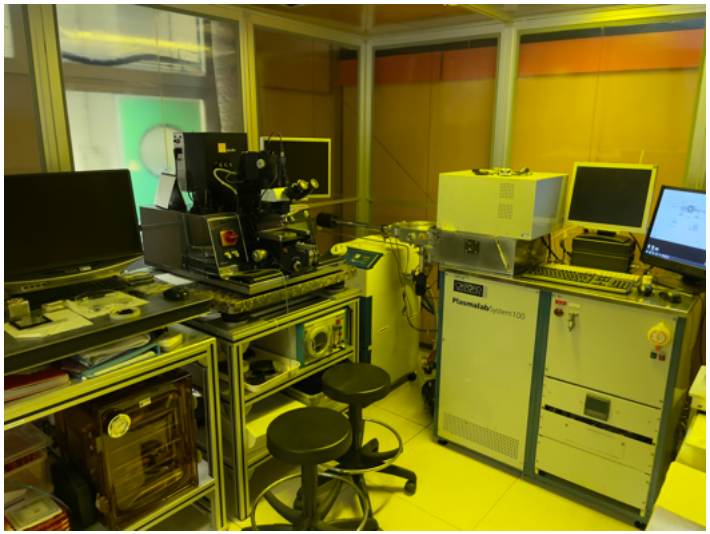
- HOLMES neutrino mass – Implantation of TES microcalorimeter
- LSPE CMB for inflaction (PI)- TES Bolometers
- ATHENA Xray Observatory – CryoAC for GeV protons in space
- AHEAD2020 (Horizon 2020) – 5-7 eV FWHM X-ray spectroscopy detector for PIXE at LABEC
- ASI_TES premiale MUR ASI-INFN (PI): Antenna coupled TES Bolometer

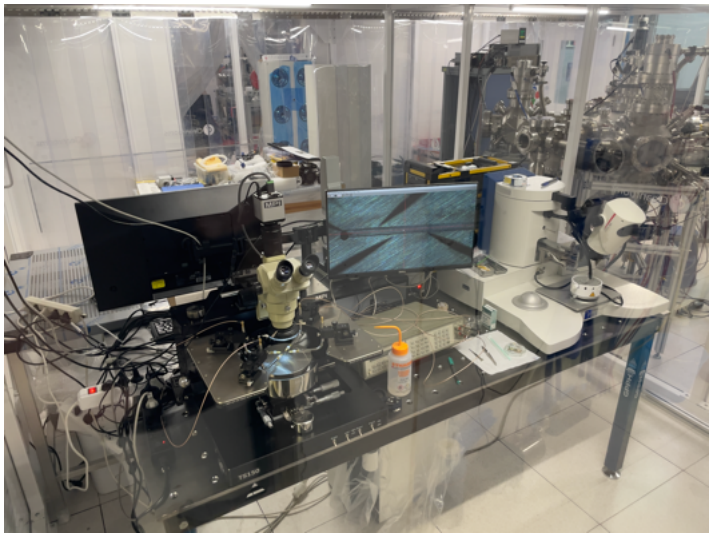
Organizer of conference LTD-10 (2003) and proposed organizer of LTD-22 (2027) and member of IAC.

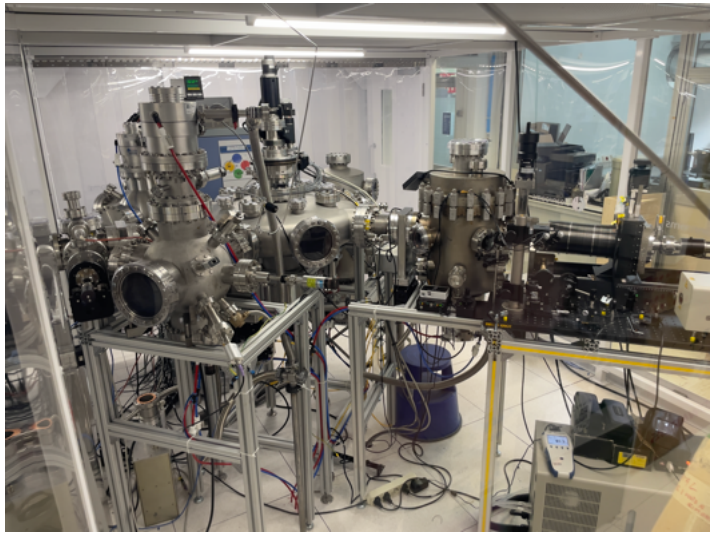


Focus on lecture and labo

- Lecture/demonstration: physics overview of LTDs – Application desing and fabrication of LTDs (single lecture and visit to fab facility)







Focus on lecture and labo

- Labo: operation of TES based detector with SQUID electronics at 0.1 K
  - SQUID Amplifier set-up
  - IV characteristics for selection of opertaion point of detector
  - Pulse data taking and spectroscopica analysis