SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Laboratory of Cryogenics

Physics Department

CEFITEC Centro de Física e Investigação Tecnológica

Collaboration with

activespace technologies
making space a global endeavour
Coimbra

cea DE LA RECHERCHE À L'INDUSTRIE GRENOBLE

requimte

esa
European Space Agency

ThalesAlenia Space

Members

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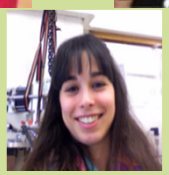
Bruno Galinhas 4º year student

Presentation

- The Laboratory of cryogenics started in 2002 by studies on orientation effects in low frequency Pulse Tube cryocooler.
- Thanks to this work, the laboratory was contracted by the CAMCAO project (FC-UL) to build a Pulse Tube cryocooler for ESO (European Southern Observatory): 30 W at 50K.
- Since 2006, our activities are focused on low temperature **heat switches**, **Cryogenics Energy Storage Units** (European Space Agency and FCT contracts) and on **adsorption studies** at low temperature (FCT contracts).
- Presently, two FCT projects (in collaboration with AST company) are running and three PhD thesis





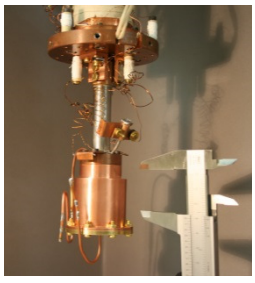


Equipment and skills

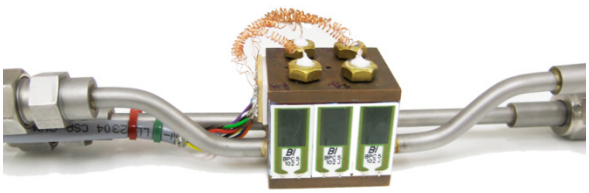
- 3 K-300 K cryocooler (1 W @ 4 K) fully equiped
- 8 K- 300 K cryocooler (2 W @ 20K) specially dedicated to adsorption measurements
- 10 K- 300 K rotating cryocooler specially dedicated to Energy Storage Units at system level for space applications (in progress).
- Resistivity, temperature, pressure, (3 K- 300 K)
- Thermal conductivity, Specific heat, (3 K- 300 K)

Some experimental devices built in our Lab

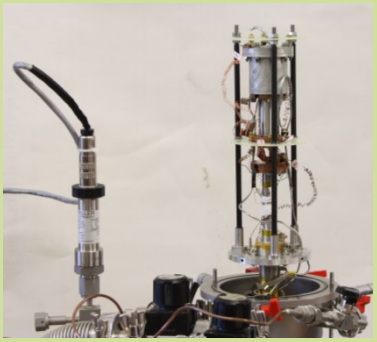
heat switch



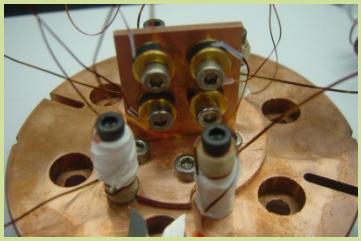
Energy Storage Unit (3 K- 6 K)



Thermal conductivity detector (Katharometer)



Energy Storage Unit at 40 K



Thermometer calibration 3K-300K

Funding: European Space Agency, FCT-MCES,

esa

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