

Laboratory of Cryogenics

Physics Department



Collaboration with



Coimbra



European Space Agency



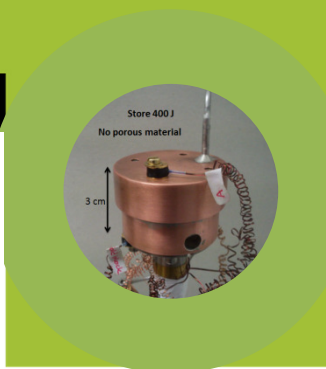
France



Inter-University Accelerator Centre

(An Autonomous Research Facility of University Grants Commission, New Delhi, India)

Índia



Members

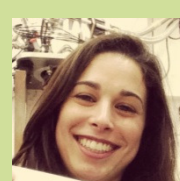
Grégoire Bonfait Ass c/agreg
Isabel Catarino Aux

Daniel Martins PhD student
Patrícia de Sousa PhD student

Gonçalo Tomás Master thesis
Jorge Barreto Master thesis

Presentation

- The Laboratory of cryogenics started in 2002 in the Physics Department by studies on orientation effects in low frequency Pulse Tube cryocooler and by building 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, one FCT project and one ESA project, both in collaboration with AST company (Coimbra) are running and two PhD thesis.



Equipment and skills

- 3 K-300 K cryocooler (1 W @ 4 K) fully equiped (Energy Storage Units, Heat Switch)
- 8 K- 300 K cryocooler, initially dedicated to adsorption measurements, presently used for heat switch and Energy Storage Unit working at 15 K.
- 10 K- 300 K rotating cryocooler initially dedicated to test 40 K Energy Storage Units versus orientation at system level for space applications. Presently used for thermal conductivity measurements
- Resistivity, temperature, pressure, (3 K- 300 K)
- Thermal conductivity, Specific heat, (3 K- 300 K)



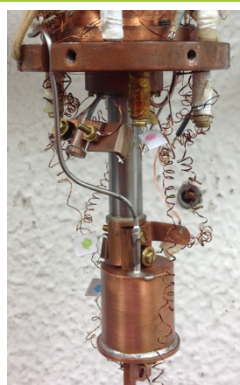
Some experimental devices built in our Lab



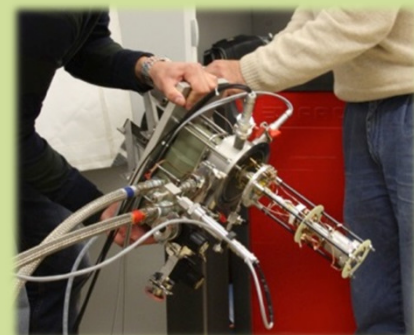
heat switch



Thermal conductivity Measurements (3 K- 100 K)



Energy Storage Unit at 15 K



Energy Storage Unit at 40 K



Funding: European Space Agency, FCT-MCES,



FCT

Fundação para a Ciência e a Tecnologia
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