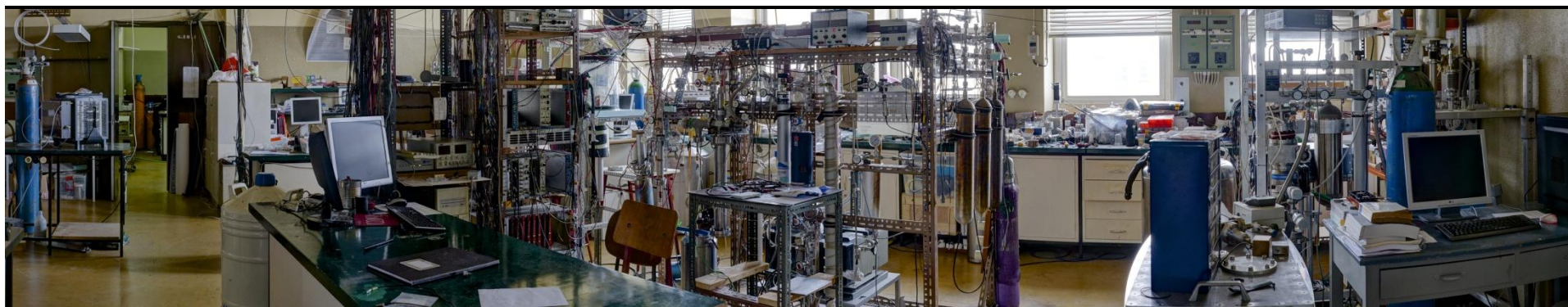


Detector Laboratory

Alberto Blanco

On behalf of the technical staff



Outlook.

- Team.
- Facilities / capabilities.
- 2015 activities.

Team.



Alberto Blanco
Physicist. Lab head.



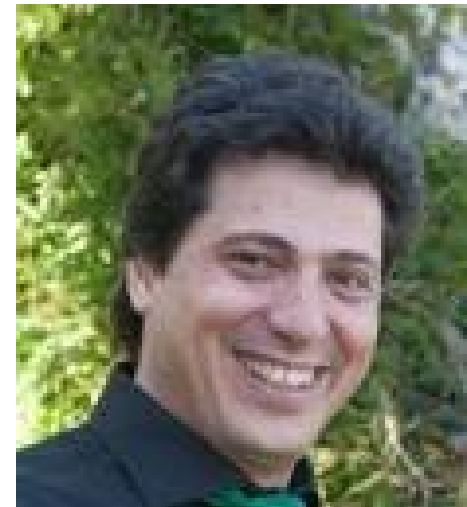
Nuno Carolino.
Electronic technician.



Orlando Cunha.
Electronic technician.

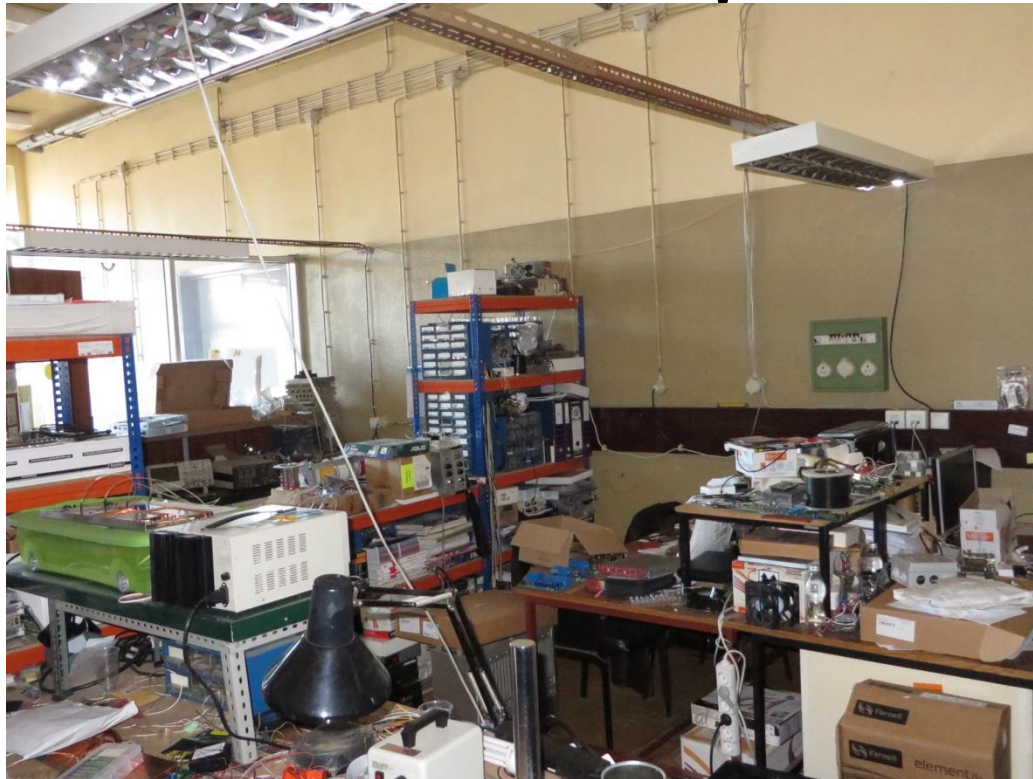


Luis Lopes.
Physicist.



Américo Pereira.
Electro-mechanical
technician.

Electronic workshop.



- Soldering stations with fume extractor.
- PCB design and simulation tools (Altium designer)
- Oscilloscopes, logic analyzers, LV & HV power supplies, pulse generators, NIM & CAMAC electronics, DAQs ...

Know-how => **Monitoring and control** (1-wire, I²C, CAN, step motors, ...) , **instrument interfaces** (RS-232, GPIB, USB, LAN, ...), **software** (μ -Controllers and GUIs), **PCB manufacturing** (layout rotting, PCB construction and loading), **electronic equipment design and reparation.**

Facilities / capabilities.

Vacuum and gas workshop.



- **Vacuum pumps.**
- **Vacuum leak checkers.**
- Variety of gas systems and accessories.
- **Thin film deposit system** (LIP is not owner).
- Variety of research gases.

Know-how => **Design, construction and test** of aluminum and steel **vacuum and ultra high-vacuum (10^{-9} mBars) systems.** Electronic feed-throughs, system motorization, **metallic thin film deposits** and **gas systems.** Adaptation of current systems to vacuum or instrumentation of vacuum systems. **Cryogenic systems.**

Facilities / capabilities.

Pseudo cleaning room. For detector assembling.



- Pressurized.
- Air quality checker.
- Convection oven.
- **Vertical laminar flow workstation.**
- **Compressed air distribution.**
- Microscope.

Facilities / capabilities.

Three experimental areas in 4th floor



- Gas / oxygen sensors + inflammable gases cabinet

Facilities / capabilities.

Three experimental areas in 4th floor



Facilities / capabilities.

Three experimental areas in 4th floor. (HADES RPC-TOF wall was assembled here!!)

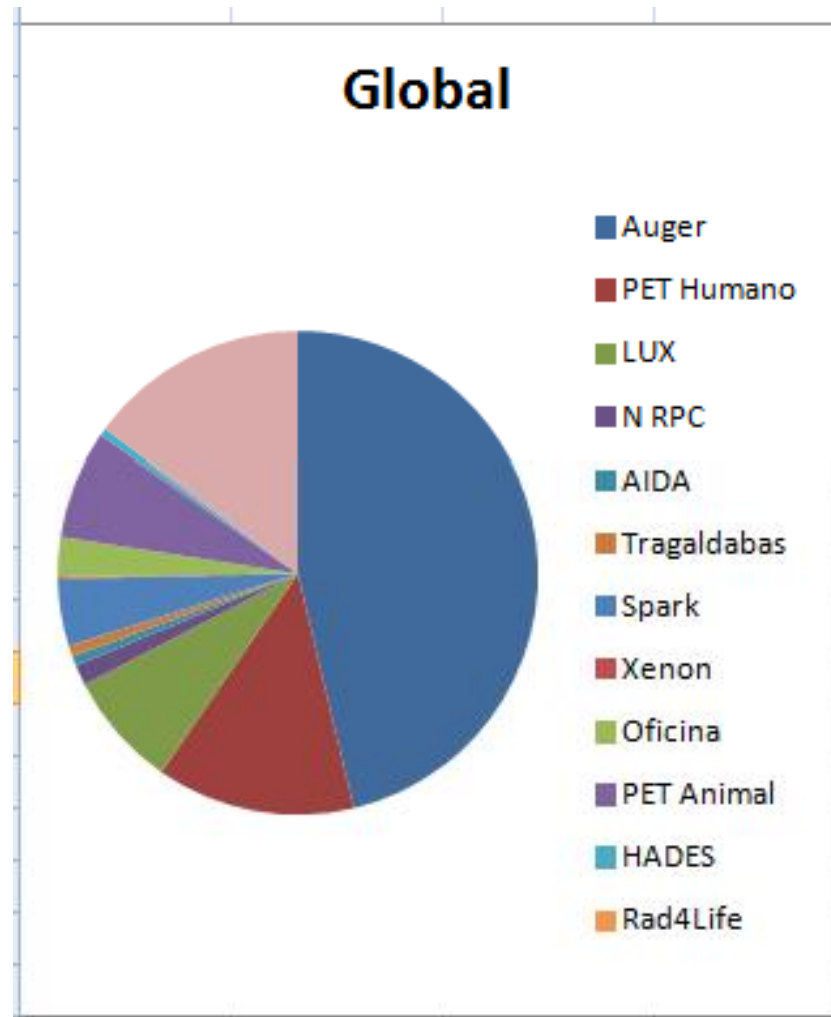


Facilities / capabilities.

One room (borrowed) for detector assembling in the Mechanical Workshop



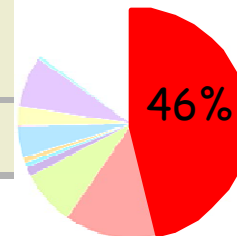
2015 activities. Occupation.



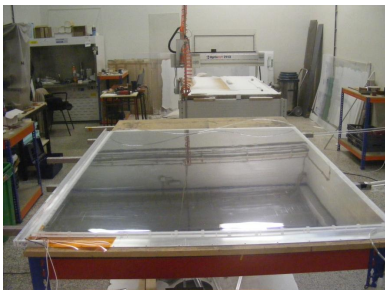
Main users

- Auger 46%
- Human PET 13%
- LUX-LZ related activities 7%
- Preclinical PET 7%
- Spark Chamber 4%
- Others 23%

2015 activities. Auger (M. Pimenta).



Auger RPC sensitive volume



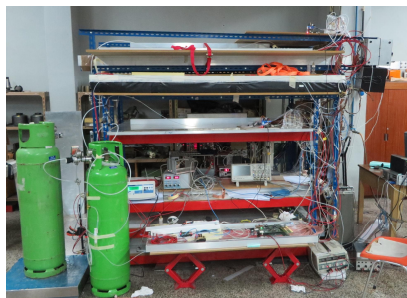
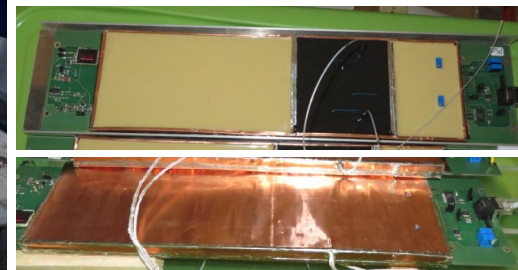
Auger RPC readout pads



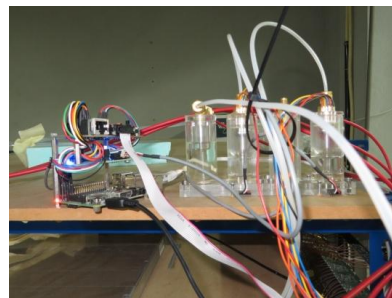
Auger RPC cabling & sensors



Auger HV PS



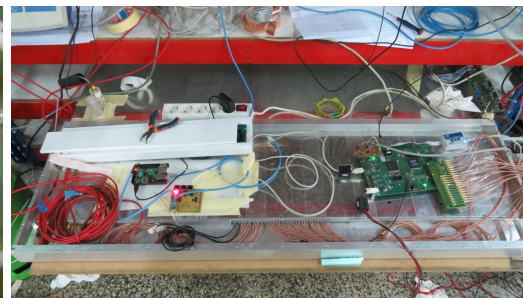
Test facility



New gas system

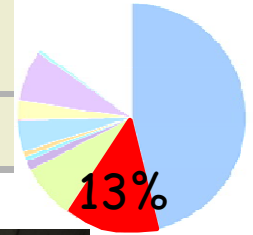


I²C multiplexer



MAROC integration

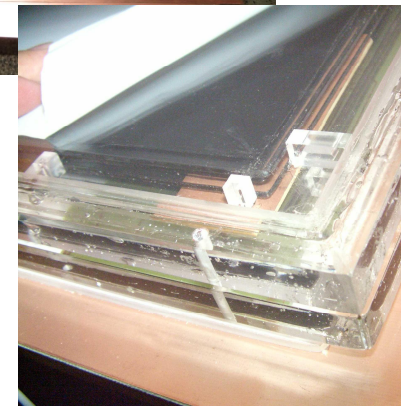
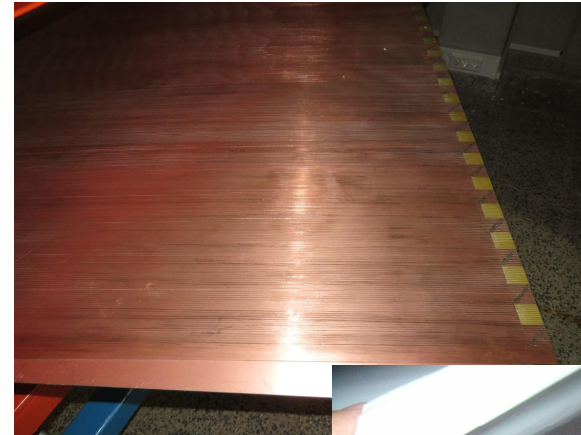
- **Construction** (14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25) and **test** (14, 15, 16, 17, 18, 22, 23) of **Auger like RPC units**.
- **Support** to development of new **Gas system**.
- Support to the integration of MAROC DAQ on electronic box.
- **Support** to the development of a **low-power HV power supply**.
- I²C multiplexer development.



Three layers RPC telescope

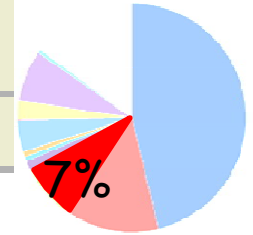


Readout electrode

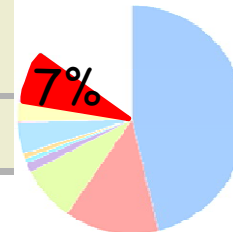


Sensitive volume

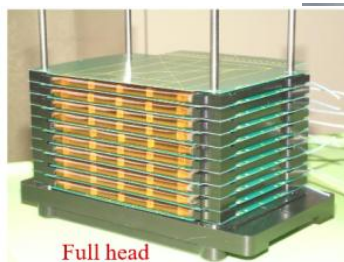
- **Construction , assembling and test** of 3 RPC layers equipped with a prototype of **Human-PET readout**.
- At the same time is a **high performance Muon telescope**.



- Support to LUX / LZ activities



Full Head

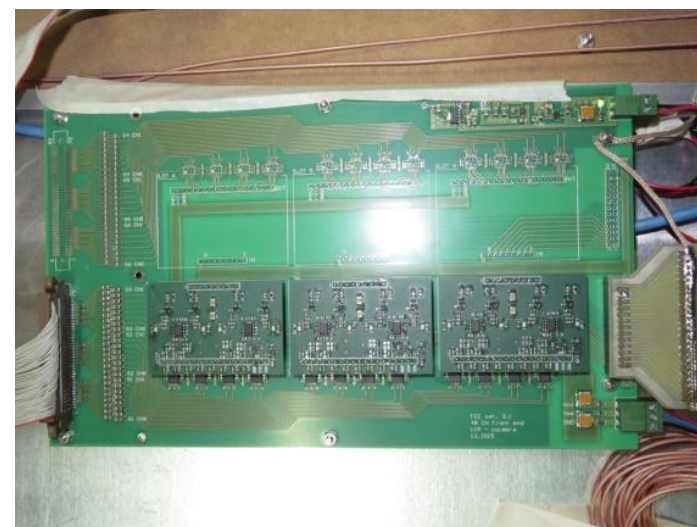


4 Heads assembled on the mechanical structure

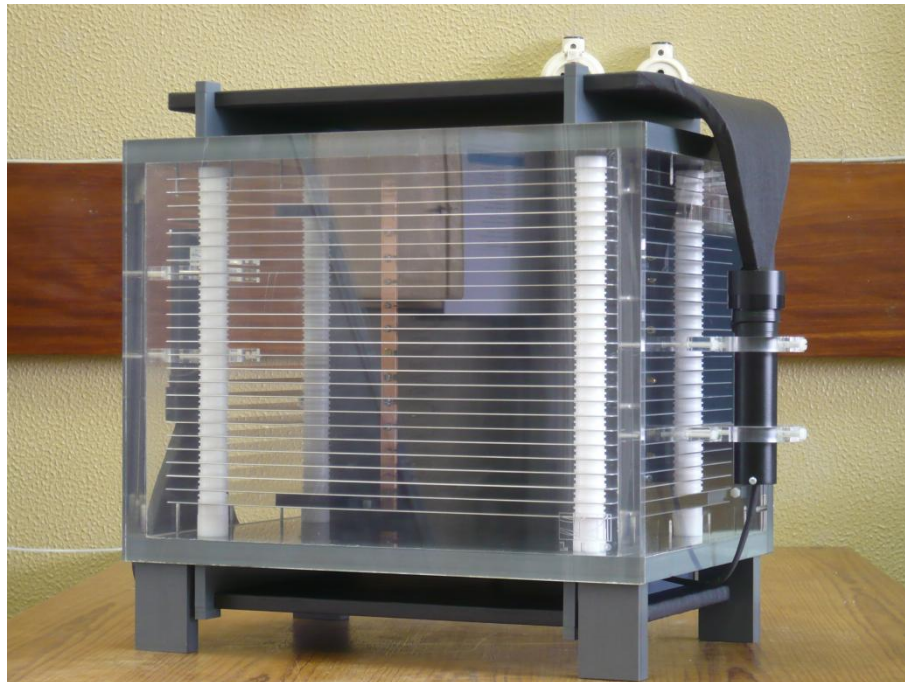
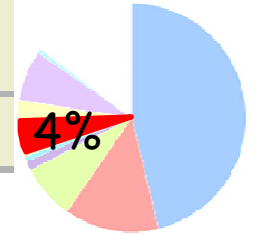


Preclinical PET @ ICNAS

- **PCB** construction (rooting) of **new FEE** design.
- **Upgrade of RPC modules.**
- **Monitoring upgrades.**
- **Maintenance.**
- RPC-PET V2 preparation.



New FEE board

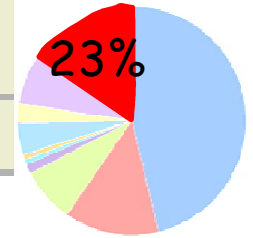


- **Construction** of a Spark Chamber for CBPF, Brazil
- **Maintenance and reparation.**
- **Support of outreach activities.**



Spark gap modified by user => chamber destroyed

2015 activities. OTHERS



- Epithermal Neutron-RPC detectors (L. Margato)
- Mechanical Workshop (N. Dias)
- AIDA2020. High rate RPCs (L. Lopes)
- TRAGALDABAS (A. Blanco)
- HADES (A. Blanco)
- RAD4Life