

Mechanical Workshop activities in 2016-2017 and near future

A. Blanco

On behalf of the MW staff

Mechanical workshop

Three engineers and one technician.



Nuno Filipe
Silva Dias
Coimbra



Rui Alves
Coimbra



Douglas
Lima
Coimbra



Carlos Silva
Coimbra

Many services and know-how available.

- **Project and design.**
- Production

CNC and **conventional milling** and **lathing** machines.

Welding (Aluminium, inox, ...)

Other: guillotine, dumbbell, calender, chain saw, polishing machine, sanders ...

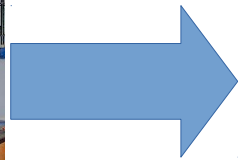


If you have a project with a mechanical component. Call us!!!

Mechanical Workshop (MW).

2016-2017 many changes on the MW

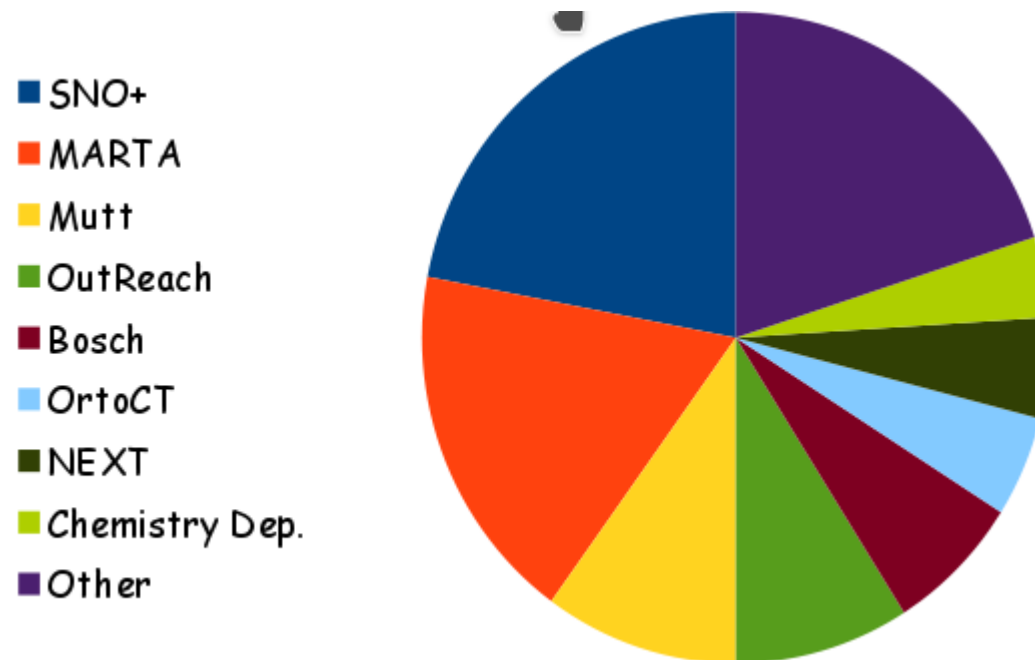
- **Reallocation of the MW facilities** to the former Physics Department MW. It took around 5% of time and it is not complete working in this conditions has been a nightmare.



- **Retirement of the technician J. Oliveira** => new Technician Douglas Lima has revealed quite efficient.
- **New coordinator** assigned to the MW. **A. Blanco**



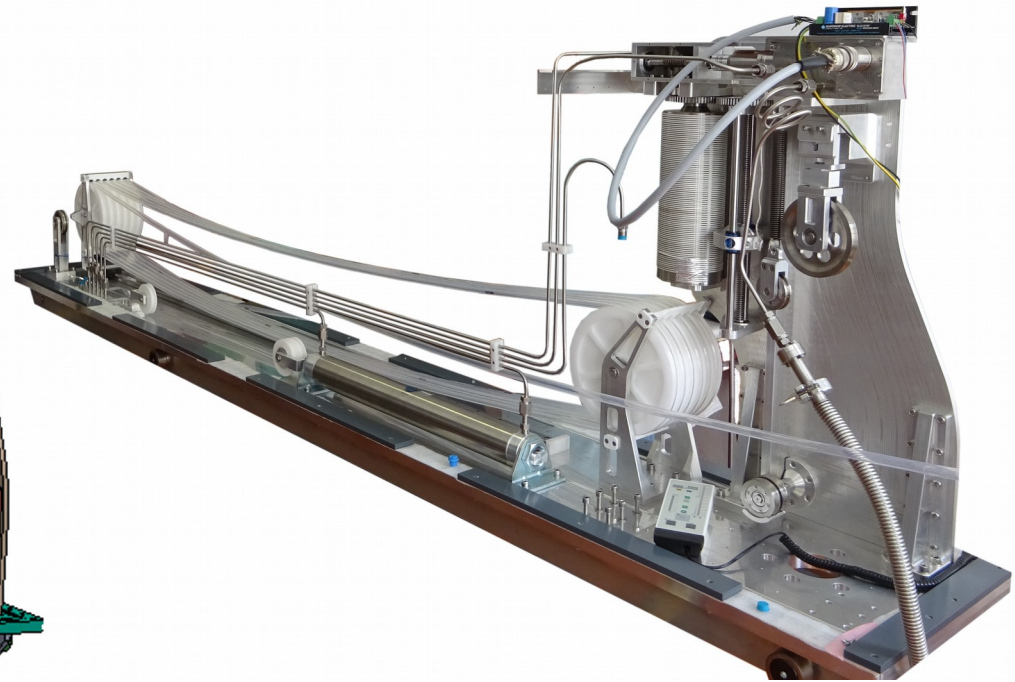
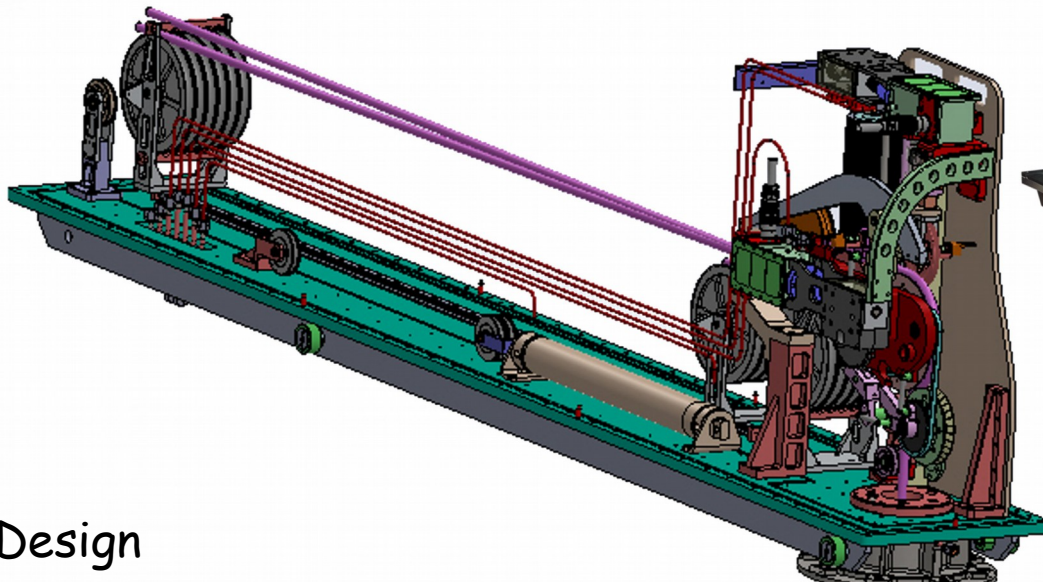
Summary of the most relevant activities in 2016-2017



Umbilical Retrieval Mechanism (URM) in the framework of SNO+ activities.

Main activity in 2016. Around 60% of the man power

Construction, assembling and test of the **Umbilical Retrieval Mechanism (URM)** (mechanics for the PMT calibration system) for the **SNO+** experiment



- Design
- Construction: milling, lathing, welding
- Assembling
- Test (together with DL).

Umbilical Retrieval Mechanism (URM) II in the framework of SNO+ activities.

2017. Around 13% of the man power. It will be finished in 2018

Construction, assembling and test of the **Umbilical Retrieval Mechanism (URM)** (mechanics for the PMT calibration system) for the **SNO+** experiment. **UNIT II.**



Status

- URM cover ready to be solder.
- Partial Vacuum test done.
- Mechanical pieces are ongoing.

Machining, annealing and vacuum tightness test of PMMA containers for radioactive sources in the framework of SNO+ activities.

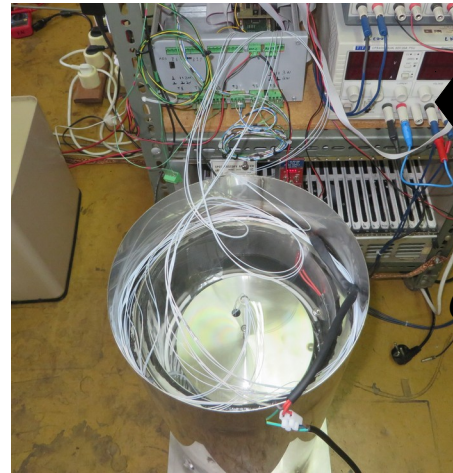
2017. Around 4% of the man power.

1



Machining
container.
(MW)

2



Home made oven with
temperature sensors
for control (MW).

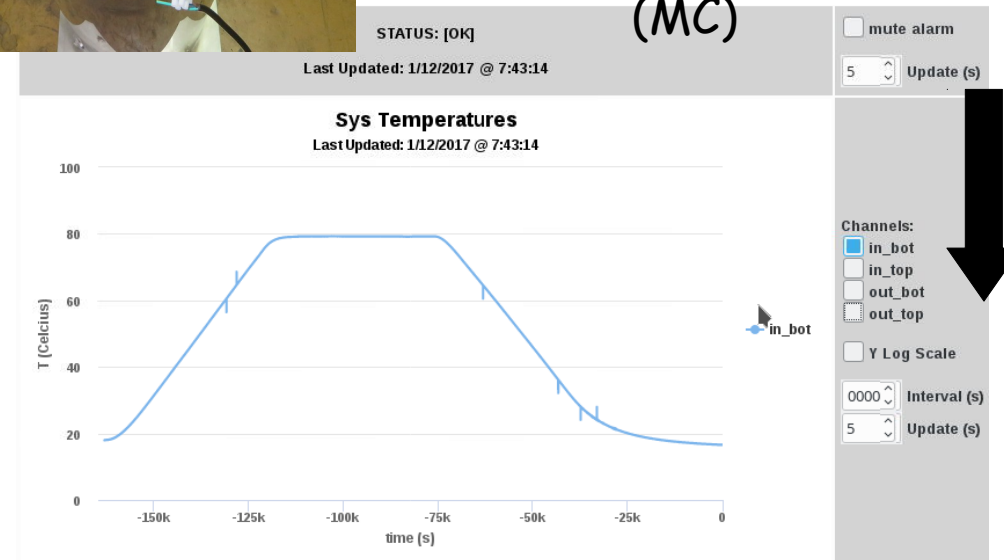
Controlled temperature profile
during the test (~48h)

(MC)

3



Vacuum
tightness test
(DL)



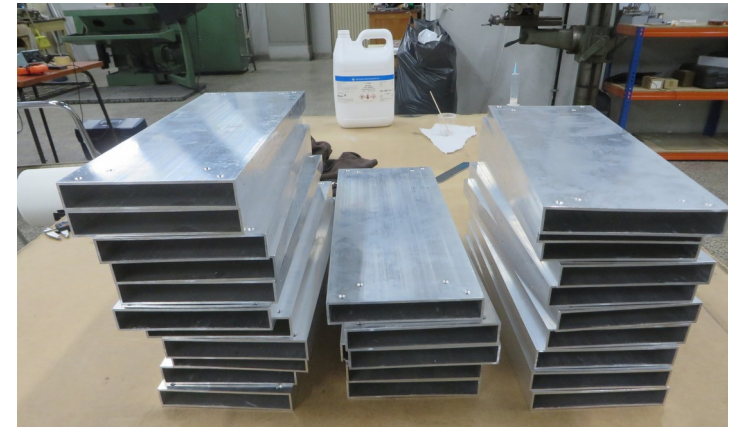
Excellent work in collaboration between two infrastructures (MW and DL) and one competence center (Monitor and Control).

Construction of pieces for the RPC detectors for the LIP-Augur group in the frame work of the project "A new generation of RPC muon detectors for high-precision high-energy cosmic-shower". MARTA

2017. Around 18% of the man power. It will be finished in 2018



More than 10k units of tiny and precise PMMA pieces



More than 50 HV PS boxes



> 150 units



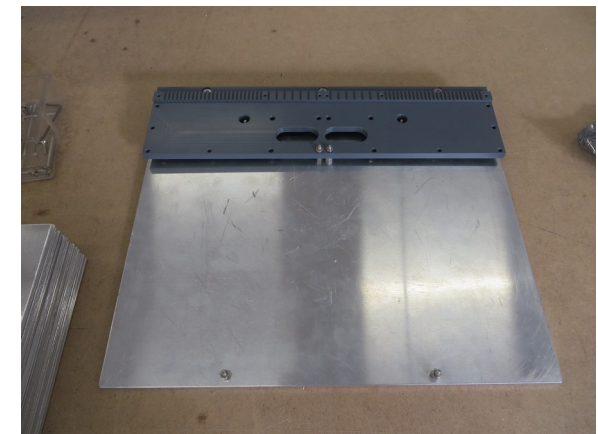
> 300 units



> 300 units



More than 100 gas connectors



More than 50 DAQ supports

50 complex acrylic bubblers,
With small pieces and 5 axis milling

Aluminium boxes and ancillary mechanics for Mutt. "A muon telescope based on RPCs for muon scatter tomography"

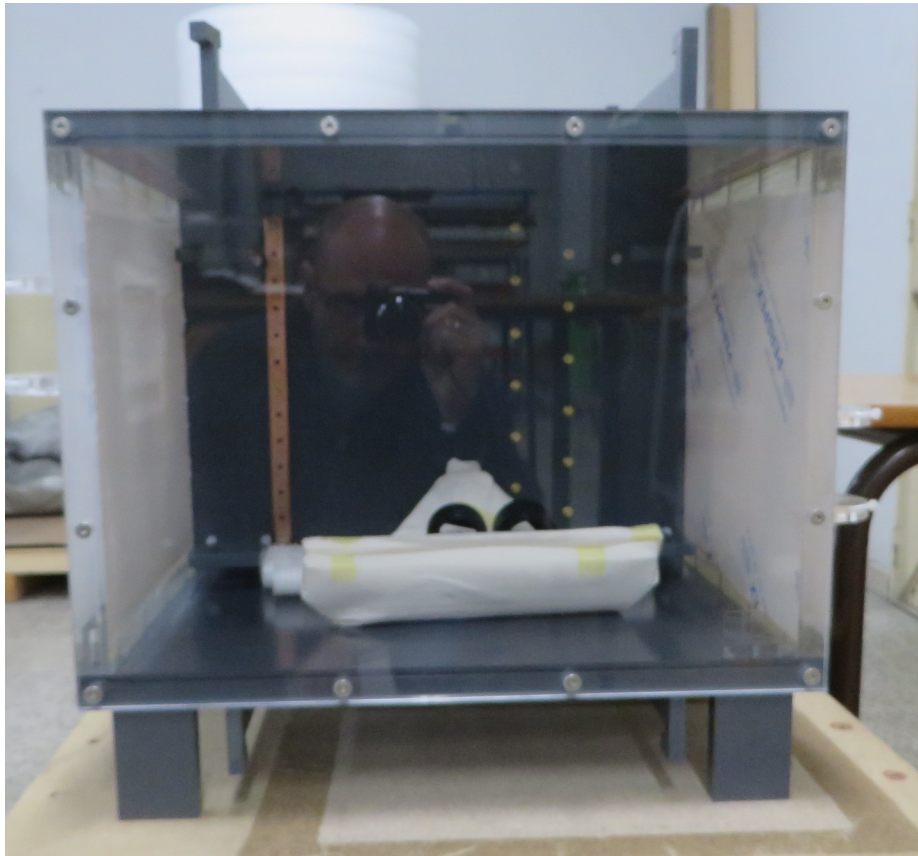
Started in 2016. In 2017 around 10% of the man power.

Construction of aluminium boxes for the project "A muon telescope based on RPCs for muon scatter tomography", (**MuTT**), for the **hydronav company**.

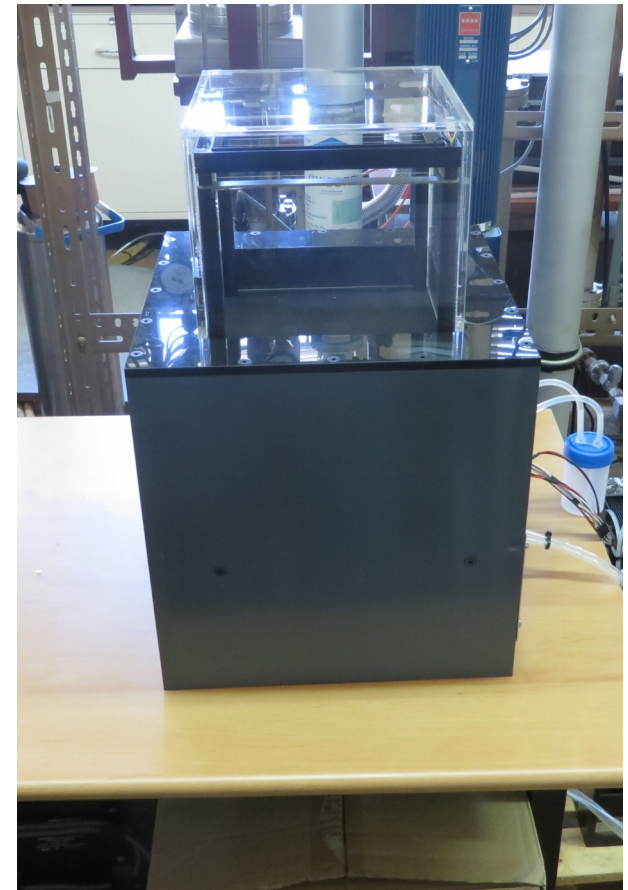


Construction of a prototype of cloud chamber and two spark chambers for the outreach project.

Started in 2016. In 2017 around 9 % of the man power.



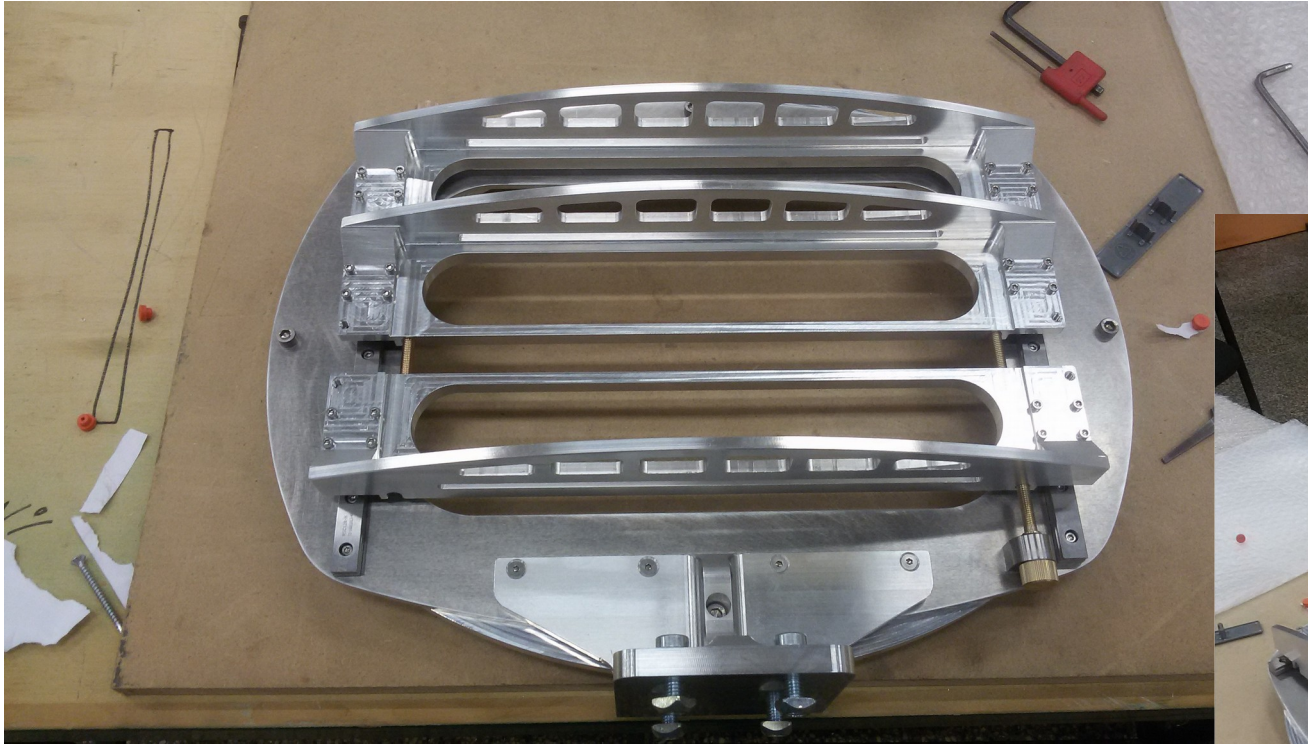
Two units produced



First prototype. More to come

Prototype of camera supports for BOSCH company

2017. Around 7 % of the manpower



Two units produced

Mechanical pieces of a test setup for the project "Orthogonal Ray Imaging for Radiotherapy Improvement, Orto-CT"

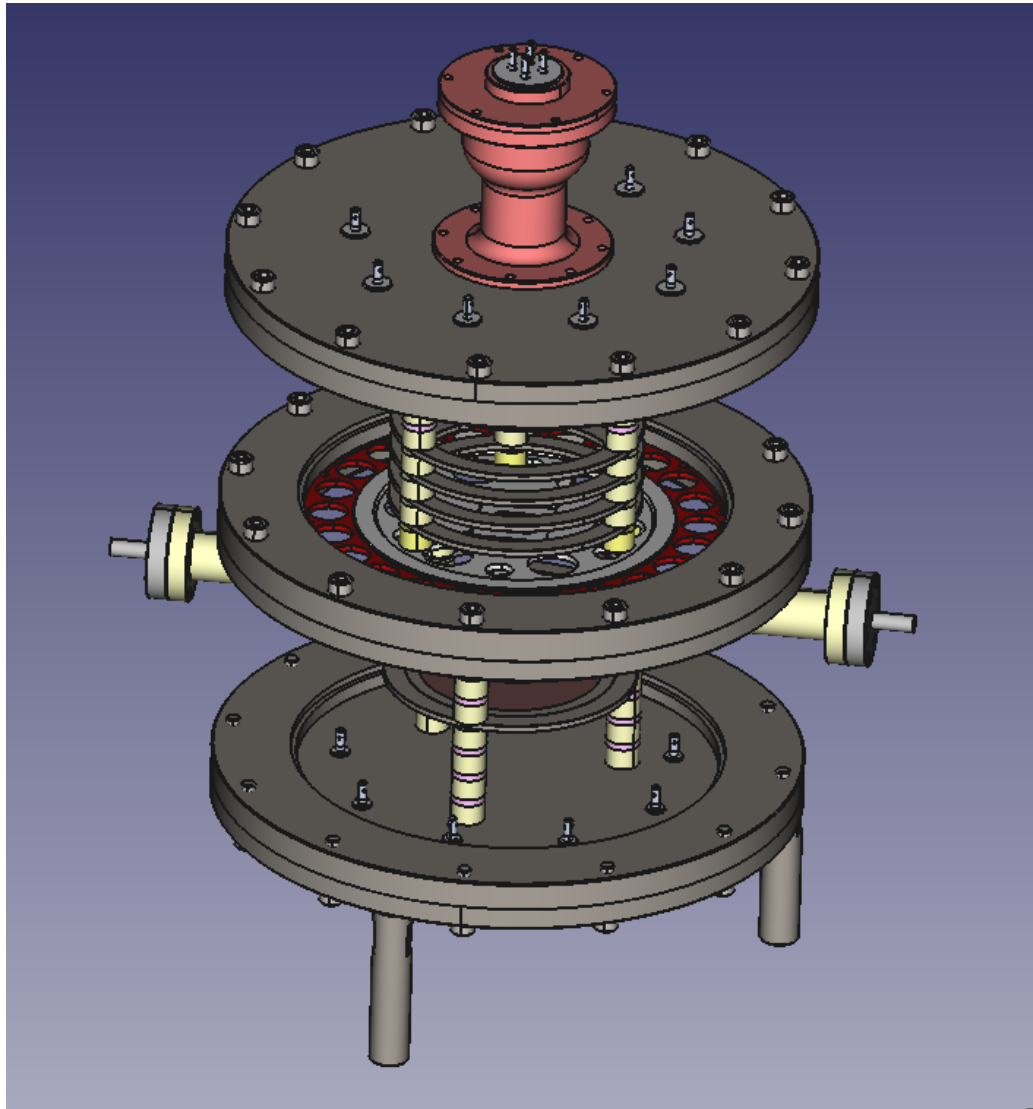
Started in 2016. In 2017 around 5 % of the manpower

PMT + scintillator + light guide mechanics



Stainless steel vessel for detector testing in the frame work of the RD51 and NEXT collaboration.

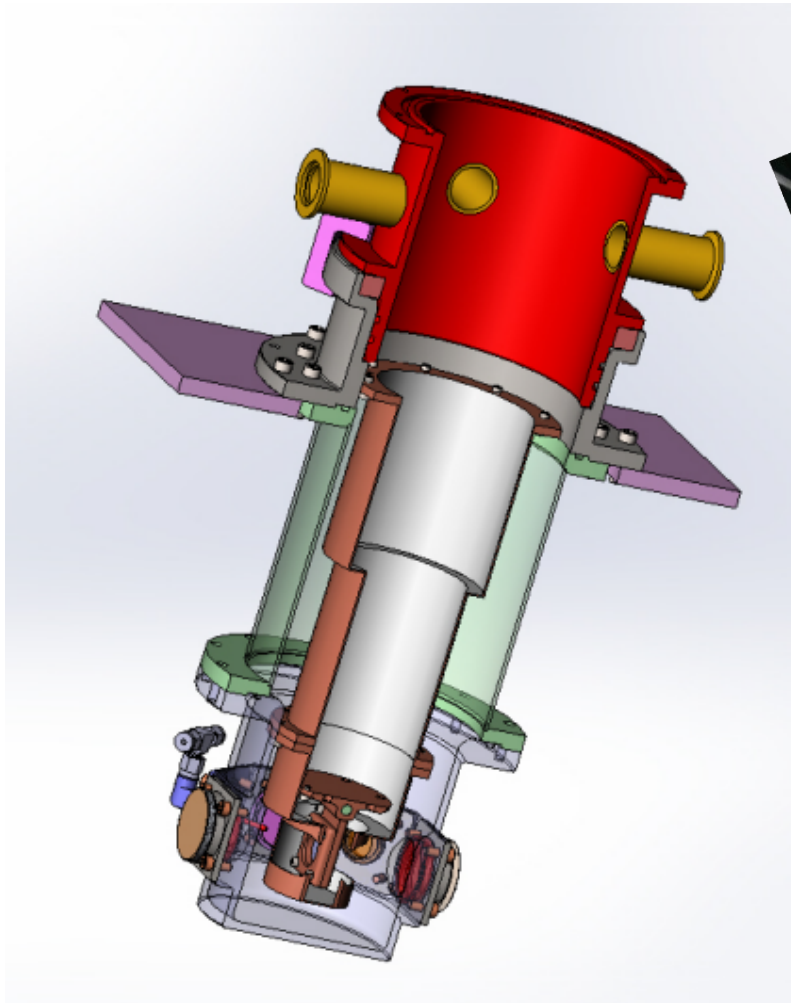
2017. Around 5 % of the manpower



Cryostat for the Chemistry Department.

Started in 2016. In 2017 around 4 % of the manpower

Construction of a cryostat for the **Chemistry Department. Criostat Laser Lab**



Other small but important activities

In 2017 around 15 % of the manpower

Many small projects

- Construction of **mechanical pieces** for **LIP-LUX/LZ** activities in the Detector Lab.
- Construction of a **wheel system** to transport and hold the **HADES-RPC** sectors.
- Preparation of **scintillators** for the Radiation, **health and environment project**.
- Final works related to the construction of high **pressure chambers** for detector testing in the framework of the **RAD4Life** project.
- Construction of **mechanical pieces** for elements of the exposition commemorative of the **30th anniversary of LIP**.
- Some other small works for the **Coimbra Physics department**.
- Construction of **new mechanics for PET v2**.
- Construction of **mechanical pieces** for new **HADES FD**.
- Construction of **mechanical pieces** and **chamber for SINE 2020** project.
- Construction of **mechanical pieces** for **AIDA 2020**.

And more

Mechanical Workshop (MW).

Near future

- **Finalize the reallocation of the MW facilities** to the former Physics Department MW.
- **One more person** to work on the MW is foreseeing. Process has been started.
- **Large area CNC milling machine** to be installed in the MW.
- **Many work is already schedule.**
 - Finalize MARTA.
 - Second unit URM II.
 - LZ mechanics.
 - Couple of test chambers for Physics department.
 - Mechanics for Physics Olympics.
 - More Spark Chambers and Cloud chambers.
 - New mechanics for RPC-PET.
 - Construction of the HADES FD chambers and mechanics.
 - RADEM mechanics.