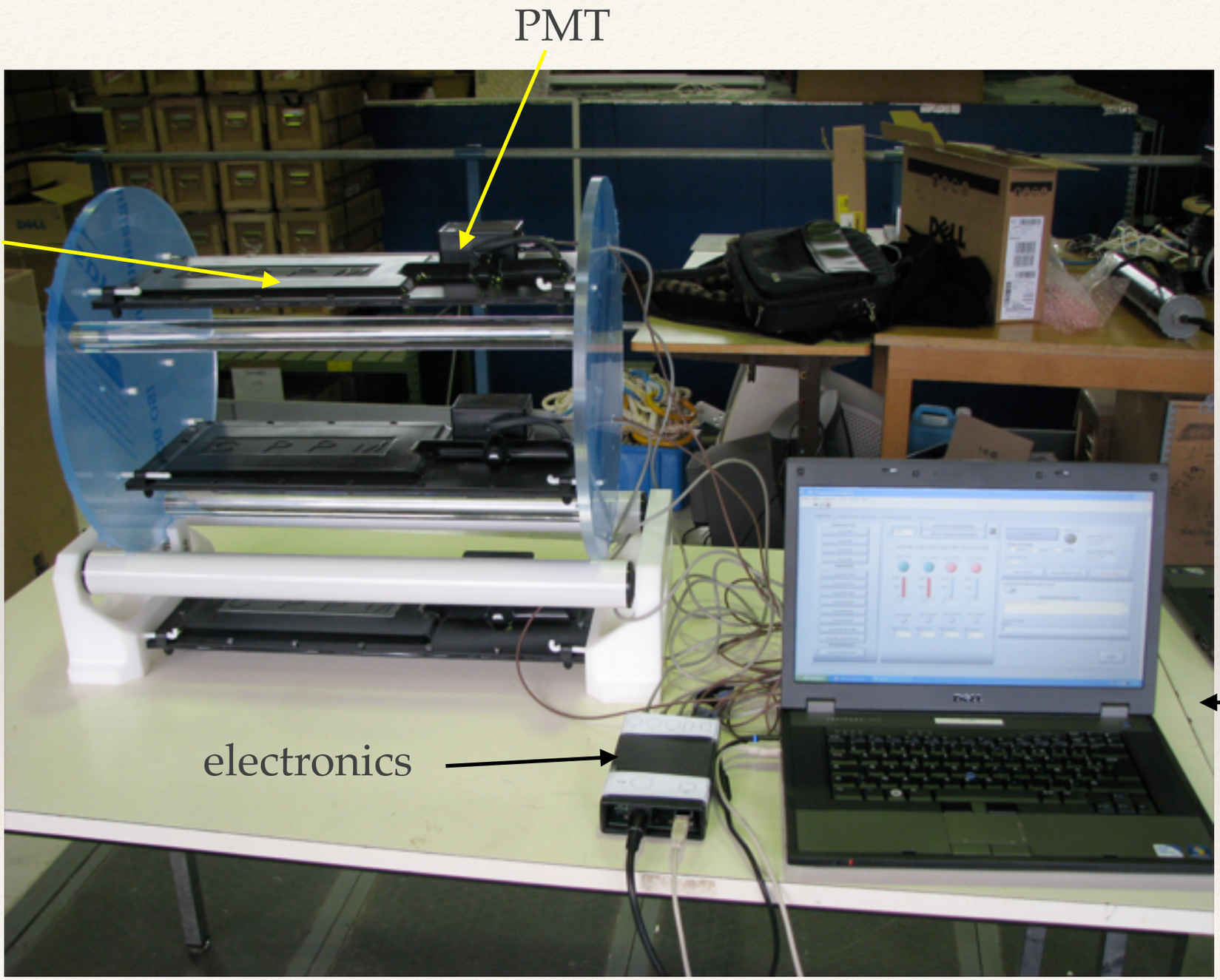
Astroparticle projects

H. Costantini
W. Gillard
V. Kulikovskiy

Goals

- get some practice with detectors and techniques for CR detection
- perform a CR measurement to study specific features of CR showers
- analyse the data and interpret the results

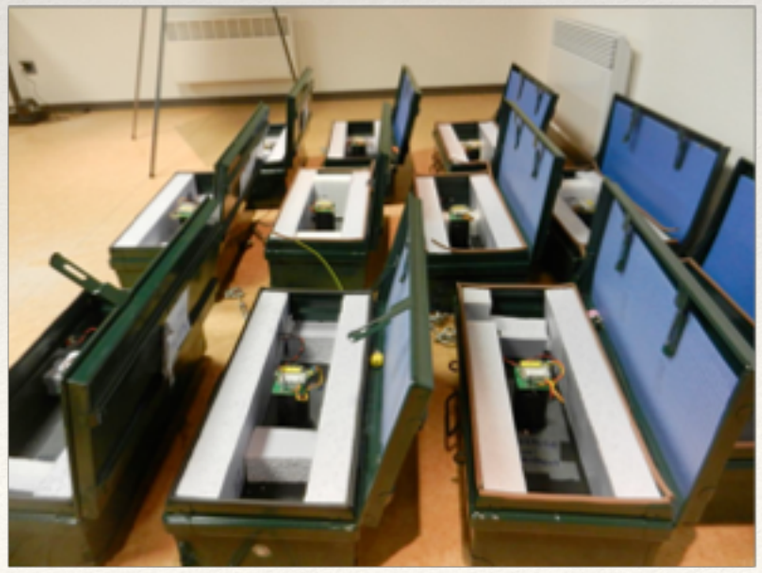
The Cosmo Detector



E-Péron Data

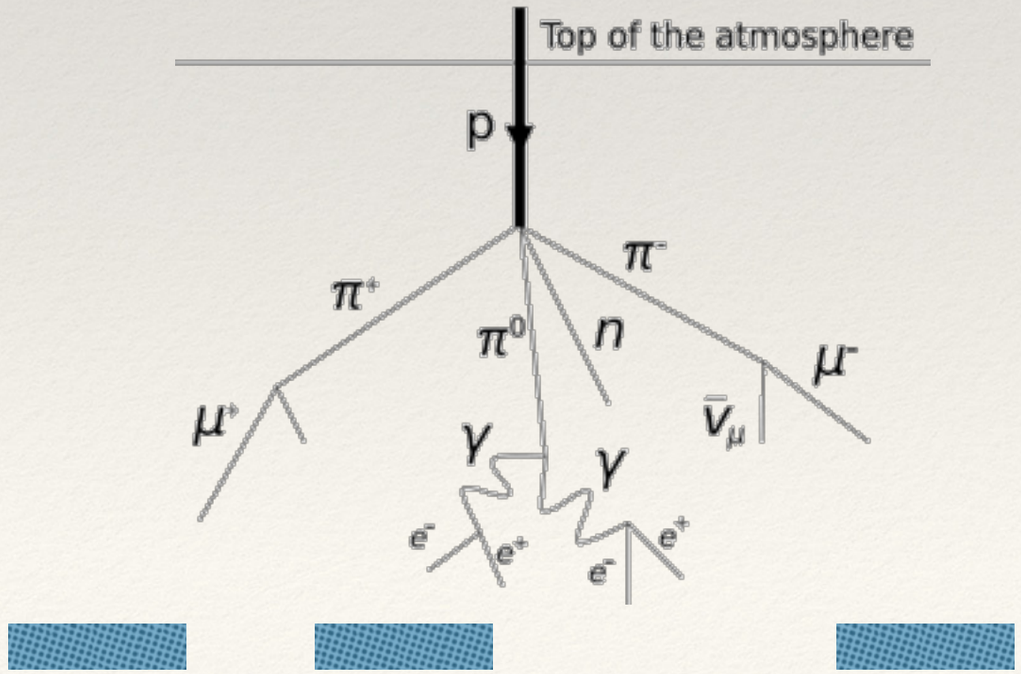
- Educational platform at the Observatory of Pic du Midi installed by researchers of CPPM with different experiments related to CR.

- We will use different types of data (matrix of scintillators installed on the roof of the Observatory, scintillator container to study muon life time)



(1) Auger Experiment

- **GOAL**: study the lateral distribution of the cosmic ray showers
- **METHOD**:
  - measure the CR rate as a function of distance between detectors using the cosmodetector
  - extend the analysis to larger distances using e-Péron data
  - compare experimental result with prediction



(2) Cosmic ray Flux and absorption

- **GOAL**: Measure the cosmic ray muon flux and the absorption of muons in buildings
- **METHOD**:
  - Measure the efficiency of the cosmodetector scintillators
  - Measure the absolute CR muon flux using two superposed scintillators and compare with expected result
- Measure the absorption at different floors at CPPM

(3a) CR Angular distribution

- **GOAL**: Study the effect of the absorption of CR in the atmosphere
- **METHOD**:
  - Measure absorption of the CR as a function of the zenith angle
  - Fit the data with an appropriate function and discuss the result

(3b) Muon lifetime

- **GOAL**: Measure the muon lifetime
- **METHOD**:
  - Understand the experimental setup of the e-Péron platform
  - determine the procedure to determine muon-lifetime
  - analyse e-Péron data and obtain the muon-lifetime