

2nd Cycle Integrated Project
Master in Engineering Physics

Energy Spectrum Reconstruction of Air-Shower Components with a Multi-Hybrid Detector Station

Presenter:

Guilherme NEVES
ist1102548

Supervisors:

Prof. Ruben CONCEIÇÃO
Prof. Pedro ASSIS



TÉCNICO
UNIVERSIDADE
DE LISBOA

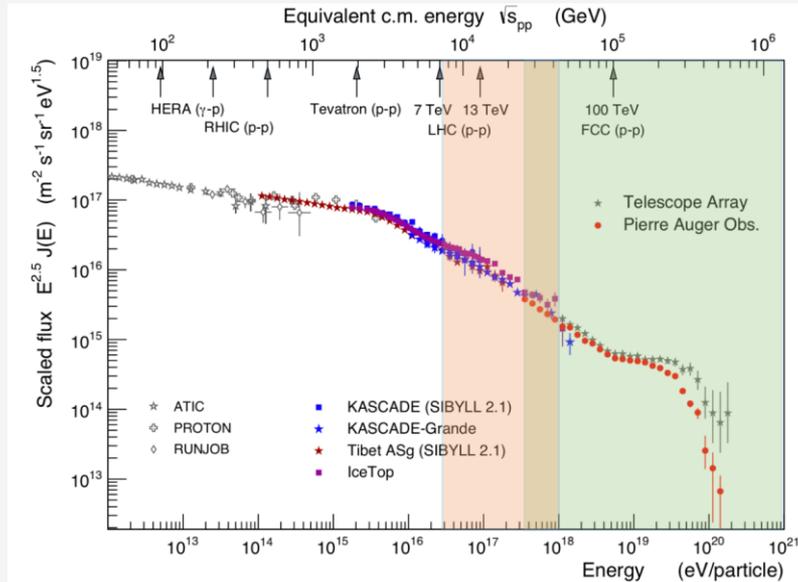


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Ultra-High Energy Cosmic Rays

Why study them?

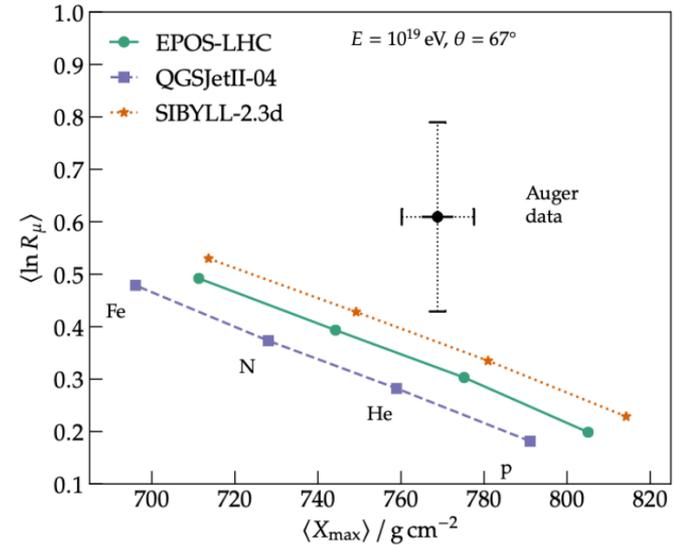
Pierre Auger coll., Phys. Rev. Lett. 117 (Oct. 2016)



UHECRs are **extremely energetic** phenomena

Pierre Auger Observatory

Low energy Extension

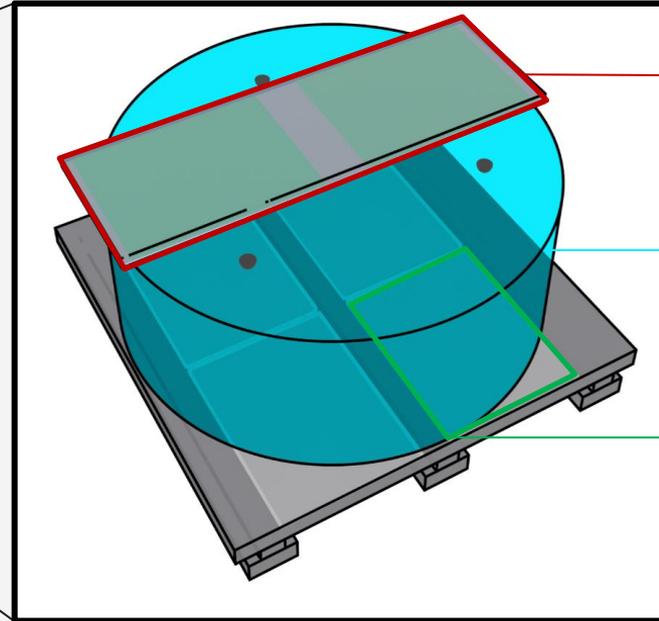
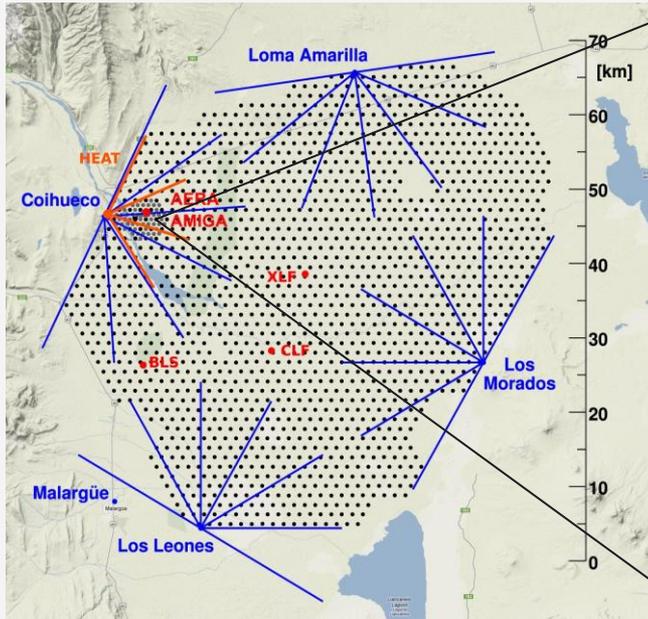


An **excess of muons** is observed relative to model predictions

Extensive Air-Showers

How to study them?

P. Assis et al., JCAP 2025.10 (Oct. 2025)



Surface
Scintillator
Detector

Water
Cherenkov
Detector

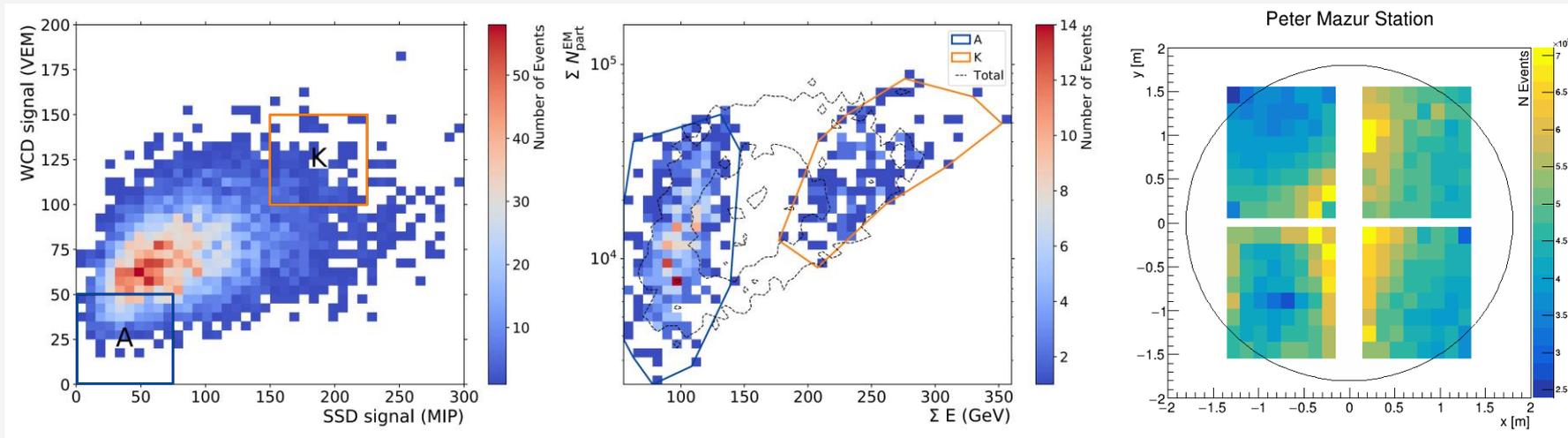
Resistive
Plate
Chamber

From an **array**...

...to a **single station**

My Thesis

What am I going to do?



EAS and detector responses
simulations → move from
signal to spectral plane



Real data from the MARTA
station @ Pierre Auger
→ detector **characterization**

