Computing at CIEMAT for HEP

DUNE Computing Consortium Workshop

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Outline

Physics Interests

Computing Resources from CIEMAT group

- PIC (located in Barcelona)
- CIEMAT (located in Madrid)

CIEMAT group in DUNE

- Institutional Contact: ines.gil@ciemat.es
- Technical Computing Contact: merino@pic.es
- ProtoDUNE-DP:
  - Responsible for ProtoDUNE-DP photon detection system (installation in Feb. 2019)
  - Involved in MC simulations of cosmic muon interactions
  - Planned contribution in detector commissioning, data taking and analysis
- DUNE:
  - Dual-Phase Photon Detection Consortium leaders
  - Supernova and Low-Energy Neutrinos WG co-coveners
  - Current contribution in full light simulation in Dual Phase Far Detector
  - Sensitivity studies of nucleon decay and supernova neutrinos in DP FD for the TDR

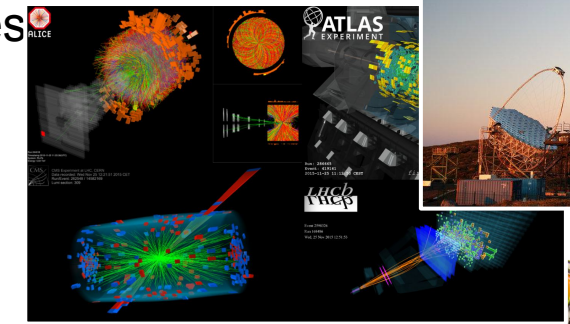
PIC data center

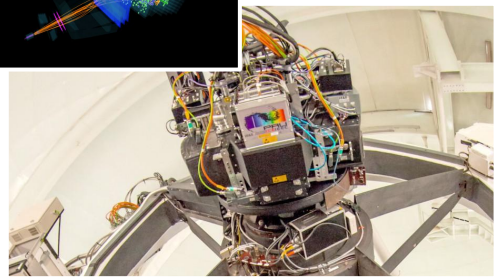
PIC
port d'informació
científica

Collaboration agreement CIEMAT-IFAE. Founded in 2003. Located in UAB campus.

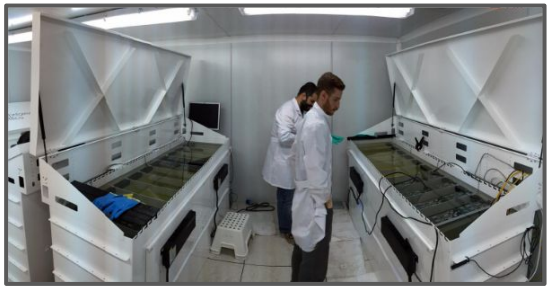
Mission: Participate at highest level in LHC Computing (Tier-1) and leverage experience to support other scientific activities

- LHC: Tier1 for ATLAS, CMS, LHCb; Tier2 and Tier3 for ATLAS
- Tier0 for MAGIC and PAU. SDC for EUCLID.
- Support for CTA LST prototype, DES, T2K, VIP (medical imaging), co2Flux (geoscience)



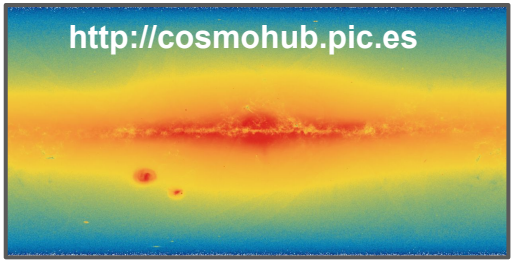


PIC data center



Data processing services

- 8400 CPU slots (HTCondor cluster)
- 10 PB disk (dCache) + 25 PB tape (Enstore)
- Bigdata platform (Hadoop/HIVE/Spark)
  - 448 cores/2TB RAM/16TB NVMe/60TB HD
  - Cosmology analysis web portal and data processing cluster



2x 10 Gbps connection to Research Networking

- Largest data mover in Spanish academic network: 27PB in/25 PB out last year

Compact installation. Refurbished in 2014-2016 to achieve high energy efficiency

- Innovative open bath liquid cooling

CIEMAT data center

- Tier-2 site for CMS
- 2500 CPU slots (HTCondor cluster)
- 2.5 PB disk (dCache)
- 2x10 Gbps WAN connection to Spanish NREN
- Supporting local communities of other HEP experiments
    - Double Chooz, DUNE, CTA, DarkSide, AMS, DES, PAU, CALICE

Computing Interests

PIC and CIEMAT data centers have long experience supporting experiments using Grid technologies.

- We propose to start contributing to DUNE computing by opening up the two data centers for opportunistic usage.
- After gaining experience, and evaluating local funding prospects, we would try to further define our medium/long term commitment.

General interests: production systems, data movement and analysis systems