
XENON Application to LHCONE

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XENON1T

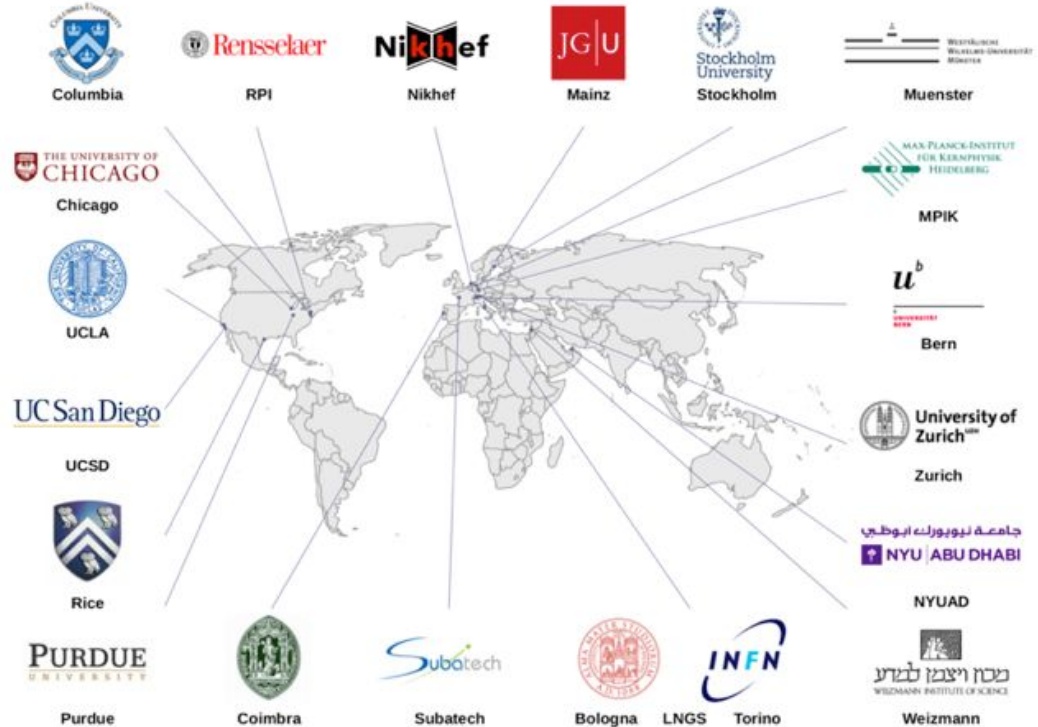
- Dark matter search experiment at Gran Sasso National Laboratory (LNGS)
- Utilizes a two-phase Time Projection Chamber
- Designed to study fundamental questions about existence and make-up of dark matter
- Commissioning began this Spring; now taking data



Fig. The XENON1T time projection chamber prior to installation at LNGS, November 2015.

Collaboration (<http://xenon1t.org/>)

- 21 institutions
- PI: Elena Aprile (Columbia University)
- Computing contacts:
 - Primary: Luca Grandi (lgrandi@uchicago.edu)
 - Secondary: Rob Gardner (rwg@uchicago.edu)
- Established as a computing virtual organization with VOMS server, etc.



Computing Model

- Raw data from LNGS is transferred to Nikhef and Chicago for processing on WLCG sites (< 1 TB/day for normal data taking)
- Simulation on WLCG sites
- Analysis facilities at Stockholm (EU hub) and Chicago (NA hub)
- Using ATLAS distributed data management software (Rucio), FTS3, and SRM endpoints to replicate datasets
 - LNGS, Nikhef, Chicago are primary endpoints

Security

- The XENON collaboration adopts the user, site, and VO security procedures and AUPs of the WLCG as described in <http://wlcg.web.cern.ch/security/computer-security>

Some iPerf measurements

- * Alcuni test effettuati con iperf (piu' flussi , ottimizzazione dei parametri TCP/IP) hanno dimostrato che i 10Gb/s sono effettivi:

Sorgente -> Destinazione	Velocità
LNGS -> INFN Napoli	8-9Gbit/s
LNGS -> CNAF	8Gbit/s
LNGS -> Nikhef	8-9Gbit/s
LNGS -> Uchicago	1-3Gbit/s
LNGS -> Weizman	2-3Gb/s

Sample traceroute

Chicago to LINGS path is Chicago -> Internet 2 -> GEANT -> GARR -> LINGS.

```
# traceroute 90.147.119.208
```

```
traceroute to 90.147.119.208 (90.147.119.208), 30 hops max, 60 byte packets
```

```
1 scidmz-mwt2.mwt2.uchicago.edu (192.170.226.1) 0.385 ms 0.522 ms 0.689 ms
2 192.170.224.77 (192.170.224.77) 0.212 ms 10.359 ms 10.363 ms
3 192.170.225.6 (192.170.225.6) 0.973 ms 1.187 ms 1.171 ms
4 et-7-0-0.115.rtr.wash.net.internet2.edu (198.71.45.57) 18.353 ms 18.337 ms 18.312 ms
5 internet2.mx1.fra.de.geant.net (62.40.125.17) 114.900 ms 107.294 ms 107.267 ms
6 ae1.mx1.gen.ch.geant.net (62.40.98.108) 133.930 ms 133.865 ms 112.487 ms
7 ae1.mx1.mil2.it.geant.net (62.40.98.113) 130.086 ms 143.007 ms 133.228 ms
8 garr-gw.mx1.mil2.it.geant.net (62.40.125.181) 133.340 ms 143.111 ms 133.685 ms
9 rx1-mi2-rx1-rm2.rm2.garr.net (90.147.80.61) 143.158 ms rx1-mi2-rx2-mi2.mi2.garr.net (90.147.80.70) 137.888 ms 131.555 ms
10 rx2-mi2-rx2-rm2.rm2.garr.net (90.147.80.65) 145.389 ms 144.853 ms 154.714 ms
11 rx2-rm2-ru-infn-lngs-pri.rm2.garr.net (193.204.219.102) 150.677 ms 159.854 ms 159.755 ms
12 xe1t-datamanager.lngs.infn.it (90.147.119.208) 140.022 ms 147.435 ms 136.840 ms
13 xe1t-datamanager.lngs.infn.it (90.147.119.208) 137.718 ms 136.501 ms 137.572 ms
```