L'Istituto Nazionale di Fisica Nucleare

Massimo Casarsa

Istituto Nazionale di Fisica Nucleare
Sezione di Trieste

Trieste, 5 settembre 2018

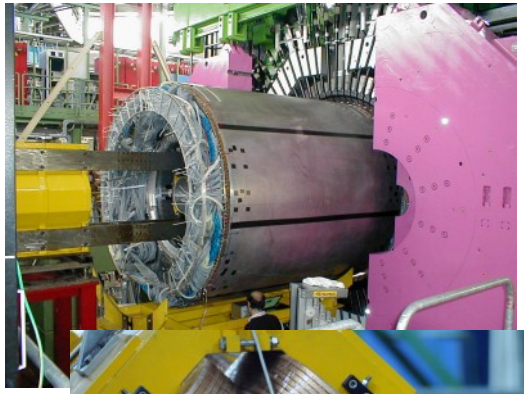
L'Istituto Nazionale di Fisica Nucleare

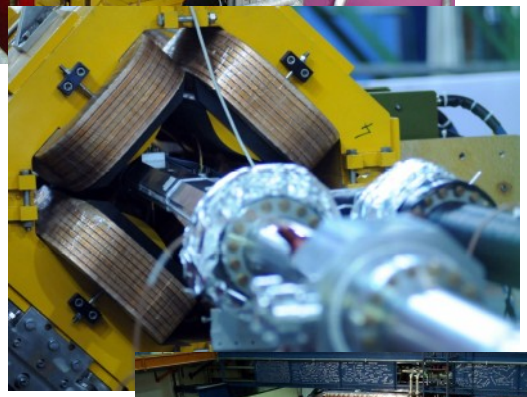
- L'Istituto Nazionale di Fisica Nucleare (INFN) è un Ente pubblico nazionale di ricerca.
- La missione dell'INFN:

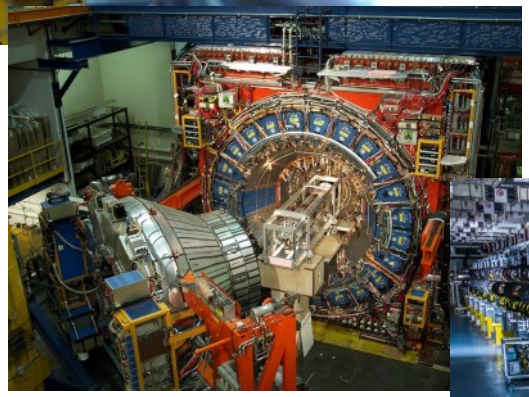
www.infn.it

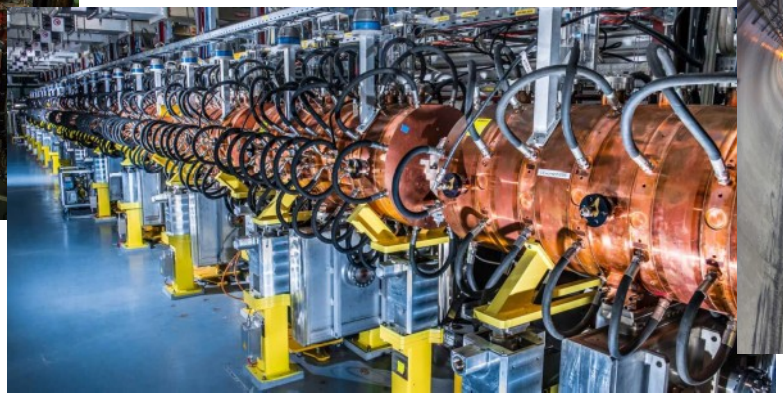
- *L'INFN promuove, coordina ed effettua la ricerca scientifica nel campo della fisica nucleare, subnucleare, astroparticellare e delle interazioni fondamentali, nonché la ricerca e lo sviluppo tecnologico pertinenti all'attività in tali settori.*
- *L'INFN opera in stretta connessione con l'Università e nell'ambito della collaborazione e del confronto internazionali.*

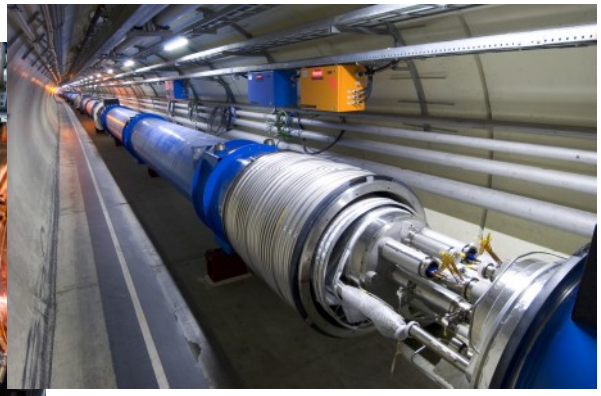
L'INFN









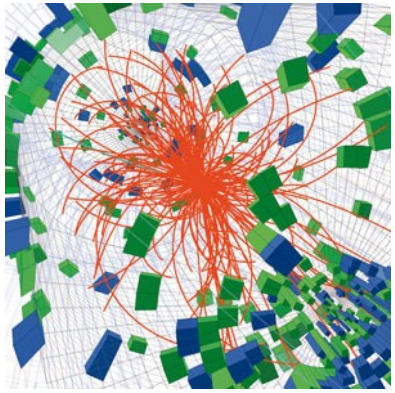


- La ricerca in fisica nucleare e delle particelle utilizza strumenti molto complessi e richiede perciò strutture, competenze e risorse adeguate per realizzarli: laboratori, officine, personale tecnico e amministrativo.

- A tale scopo gruppi di fisici delle Università di Roma, Padova, Torino e Milano fondarono nel 1951 l'Istituto Nazionale di Fisica Nucleare.

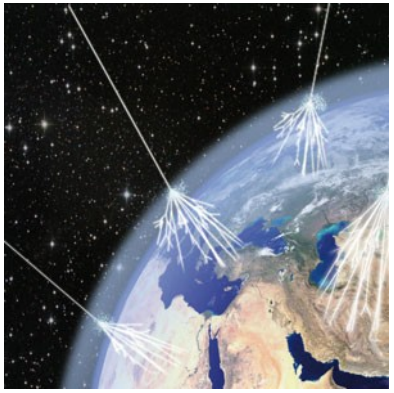
L'attività di ricerca dell'INFN

- L'attività dell'INFN è organizzata in cinque linee di ricerca, ciascuna diretta e coordinata da una Commissione Scientifica Nazionale (CSN):



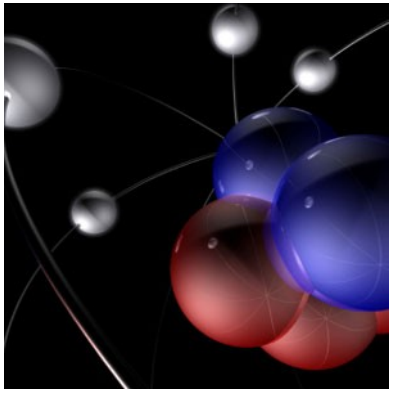
CSN-1

Fisica delle particelle



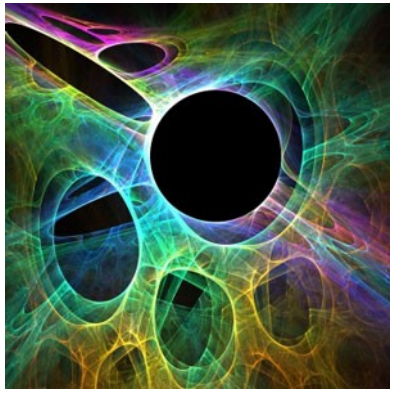
CSN-2

Fisica astroparticellare



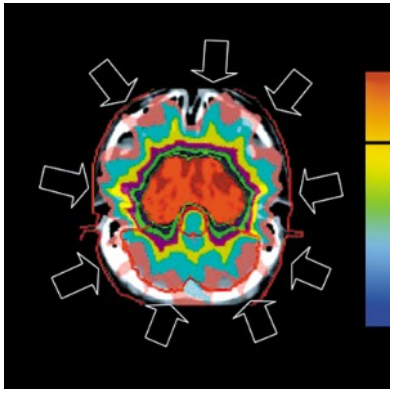
CSN-3

Fisica nucleare



CSN-4

Fisica teorica

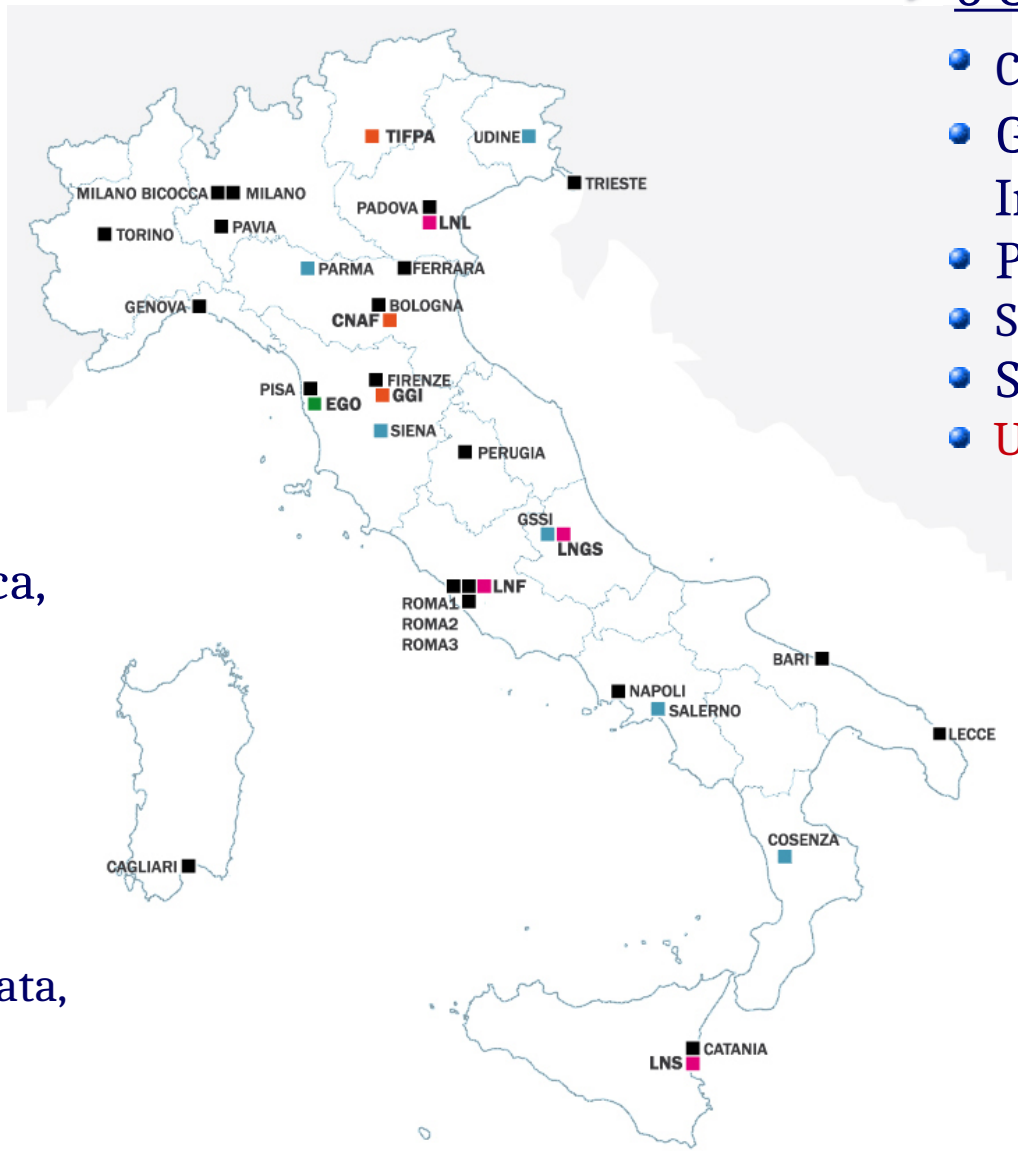


CSN-5

Ricerca tecnologica

Sezioni e Gruppi collegati

- 20 Sezioni:
  - Bari,
  - Bologna,
  - Cagliari,
  - Catania,
  - Ferrara,
  - Firenze,
  - Genova,
  - Lecce,
  - Milano,
  - Milano Bicocca,
  - Napoli,
  - Padova,
  - Pavia,
  - Perugia,
  - Pisa,
  - Roma,
  - Roma Tor Vergata,
  - Roma Tre,
  - Torino,
  - Trieste.



- 6 Gruppi collegati:
  - Cosenza,
  - Gran Sasso Science Institute (GSSI), AQ.
  - Parma,
  - Salerno,
  - Siena,
  - Udine.

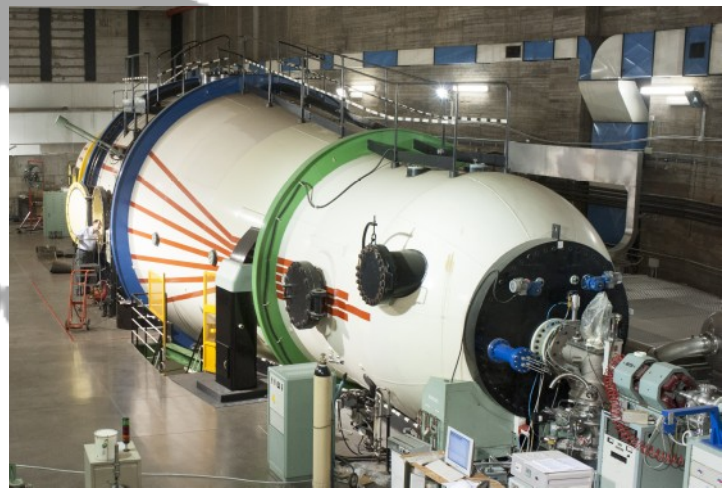
Laboratori nazionali

- Laboratori Nazionali di Legnaro (LNL), Legnaro (PD).

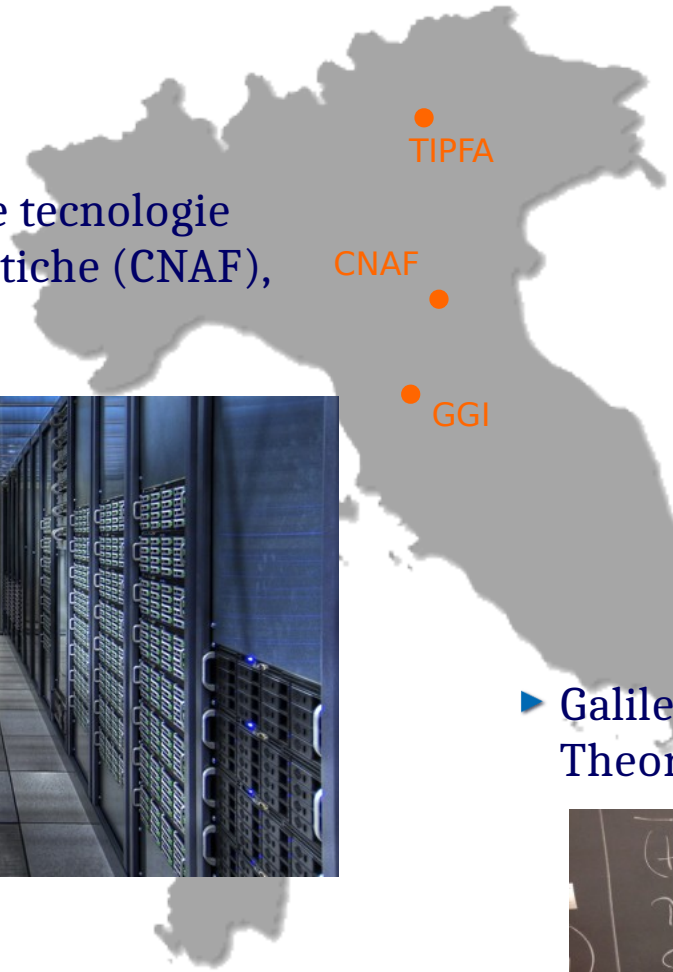
- Laboratori Nazionali del Gran Sasso (LNGS), Assergi (AQ).

- Laboratori Nazionali di Frascati (LNF), Frascati (RM).

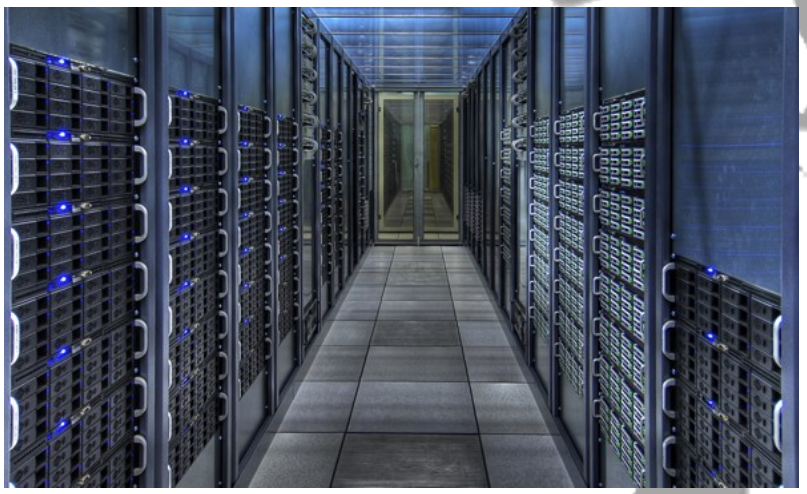
- Laboratori Nazionali del Sud (LNS), Catania.



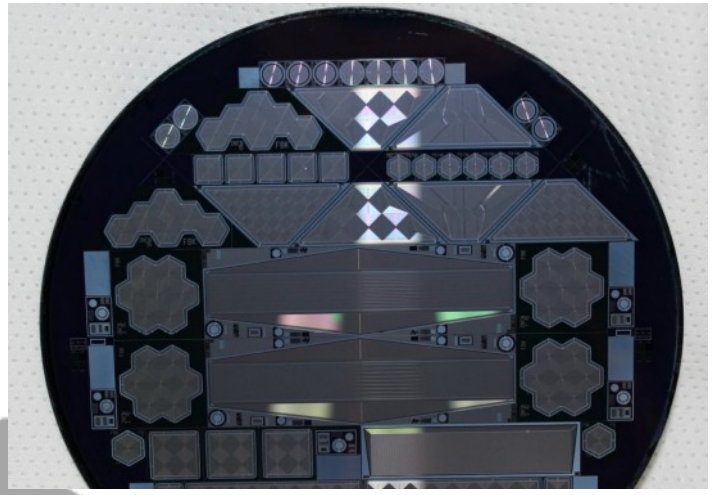
Centri nazionali



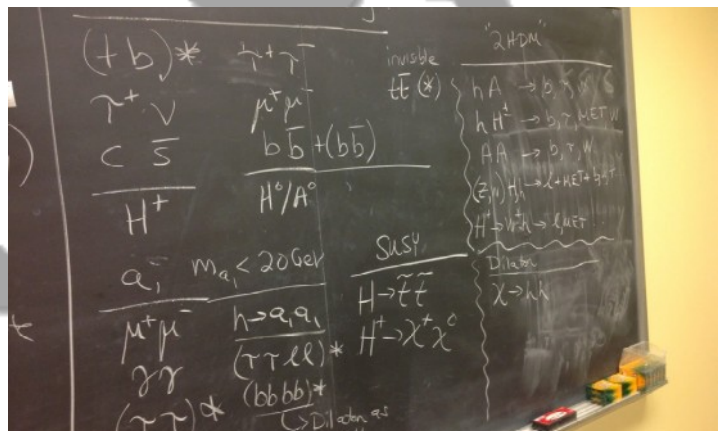
- Centro nazionale delle tecnologie informatiche e telematiche (CNAF), Bologna.



- Trento Institute for Fundamental Physics and Applications (TIFPA), Trento.

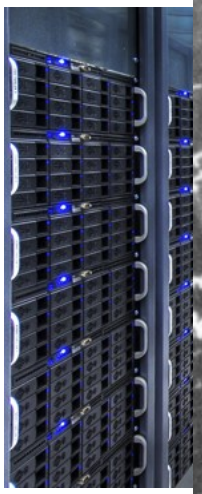


- Galileo Galilei Institute (GGI) for Theoretical Physics, Arcetri (FI).



Centri nazionali

- Centro na
  informat
  Bologna.



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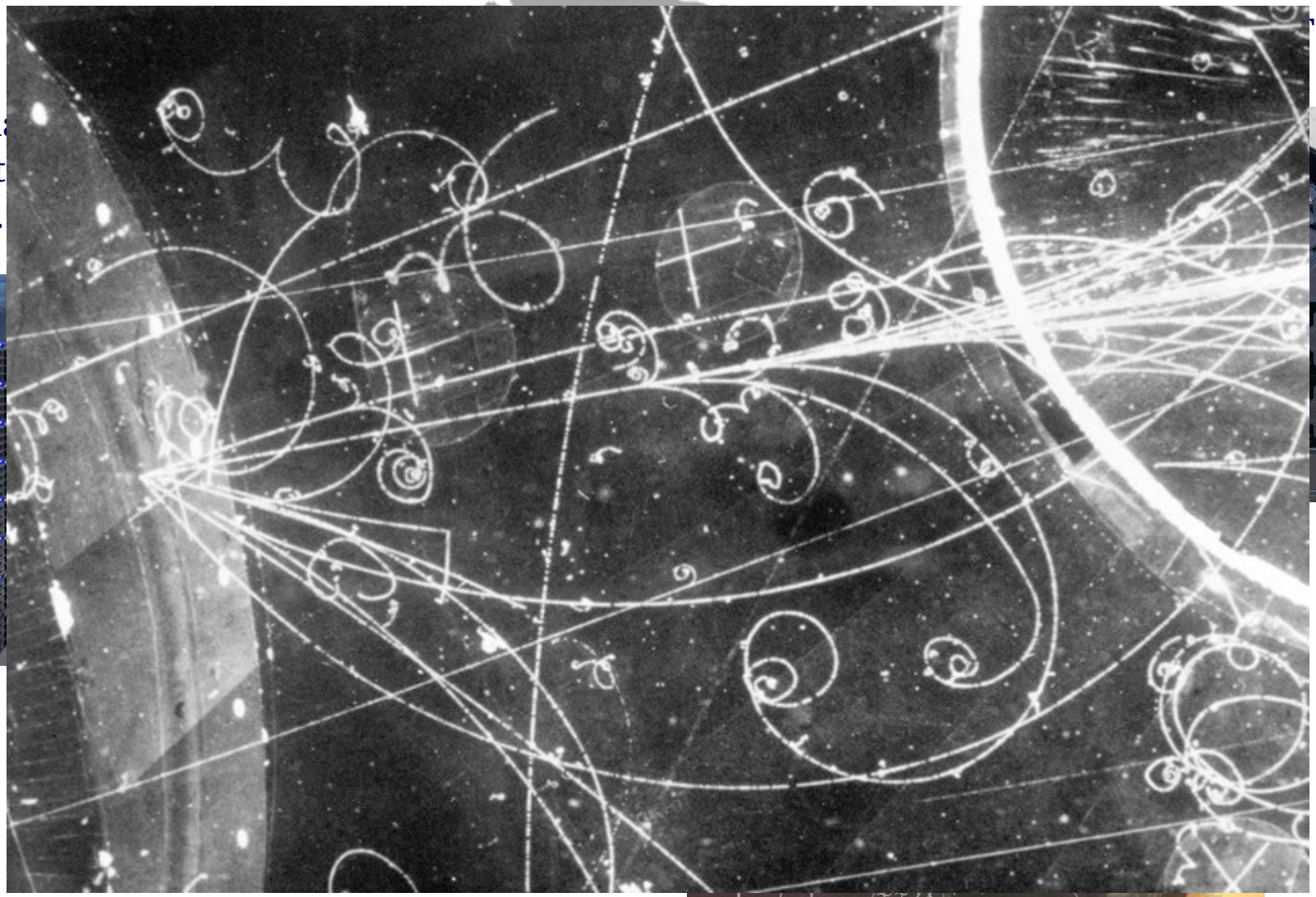
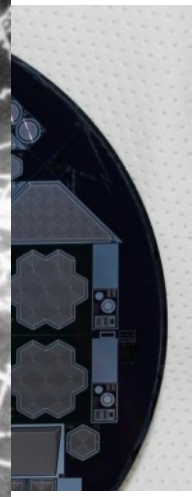
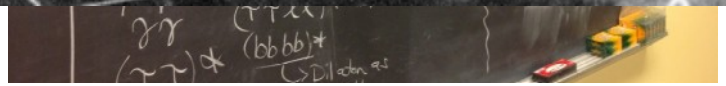
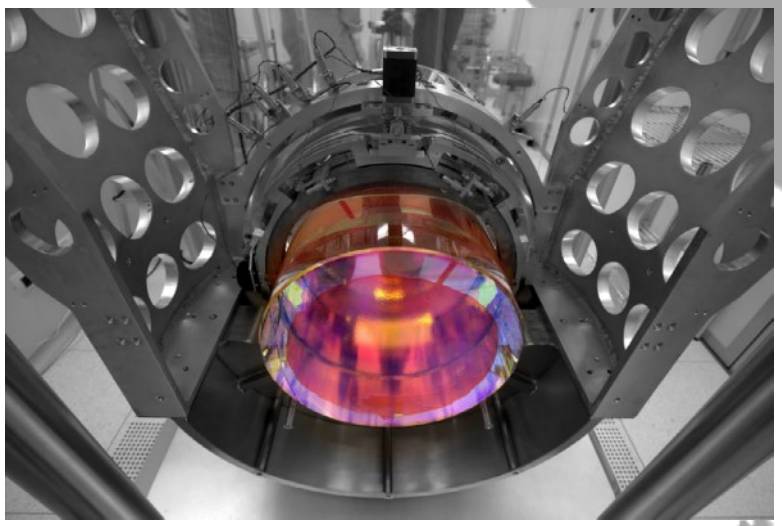




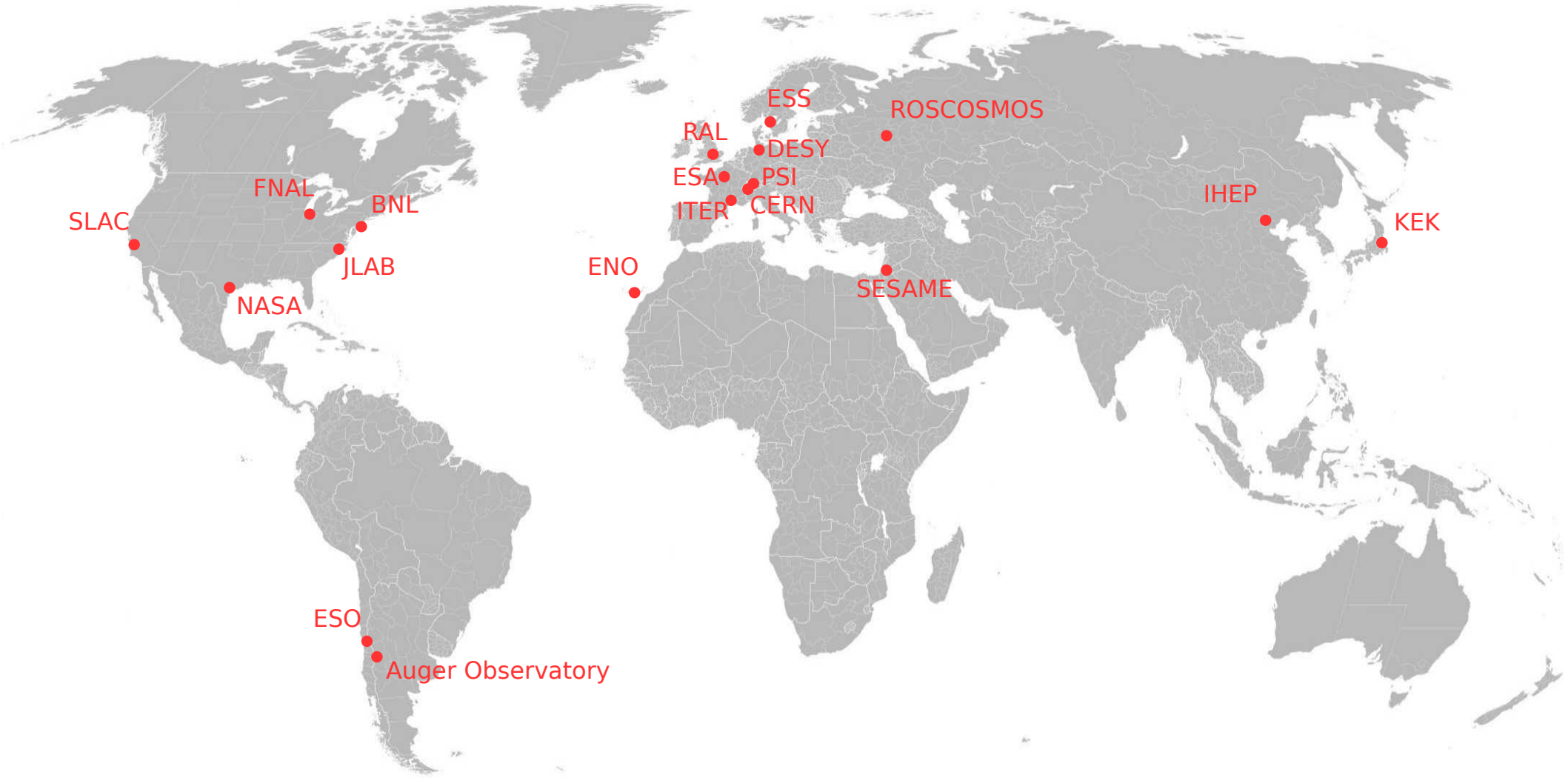


Consorzio INFN-CNRS

- European Gravitational Observatory (EGO), Cascina (PI).



Partner internazionali dell'INFN

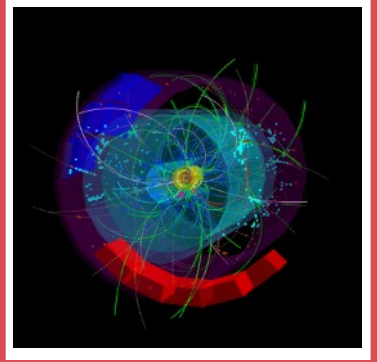


Investigazione sperimentale

- Lo studio della Natura da parte della fisica moderna non si limita a speculazioni teoriche o puri ragionamenti logici, ma si fonda su esperimenti controllati e misure rigorose dei fenomeni naturali.
- Nella fisica delle particelle ci sono due approcci complementari:

Misure coi raggi cosmici, sia a terra che su satelliti:

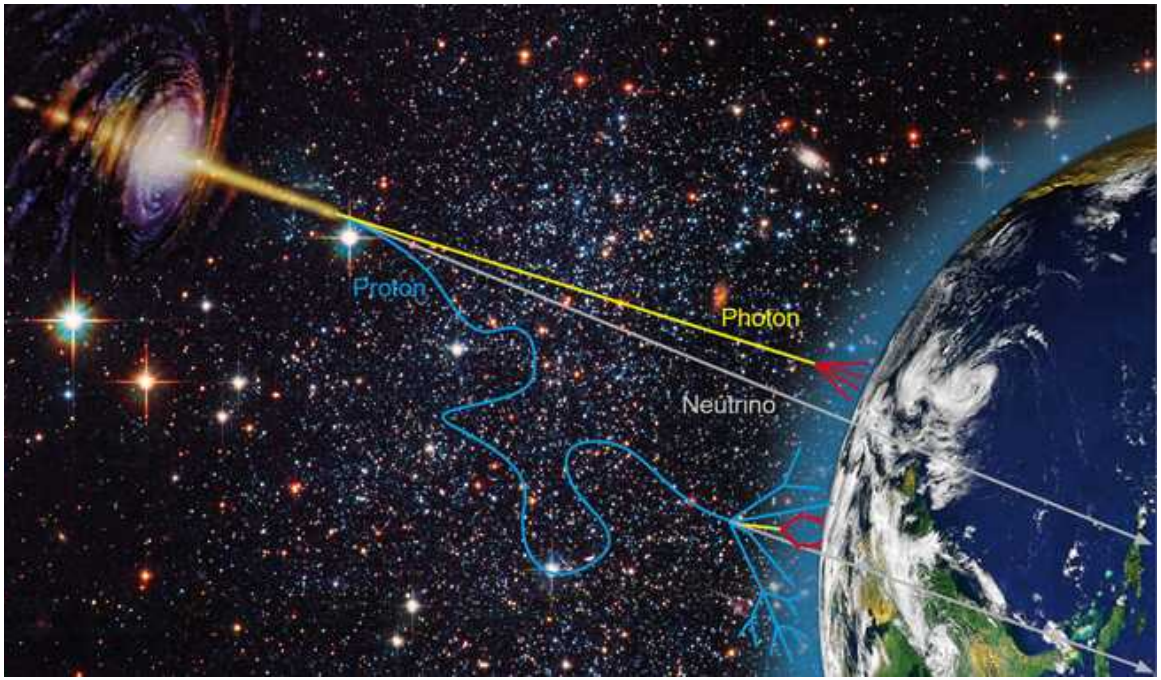
- danno accesso a fenomeni rari che avvengono nell'Universo;
- eventi unici e non riproducibili in laboratorio.

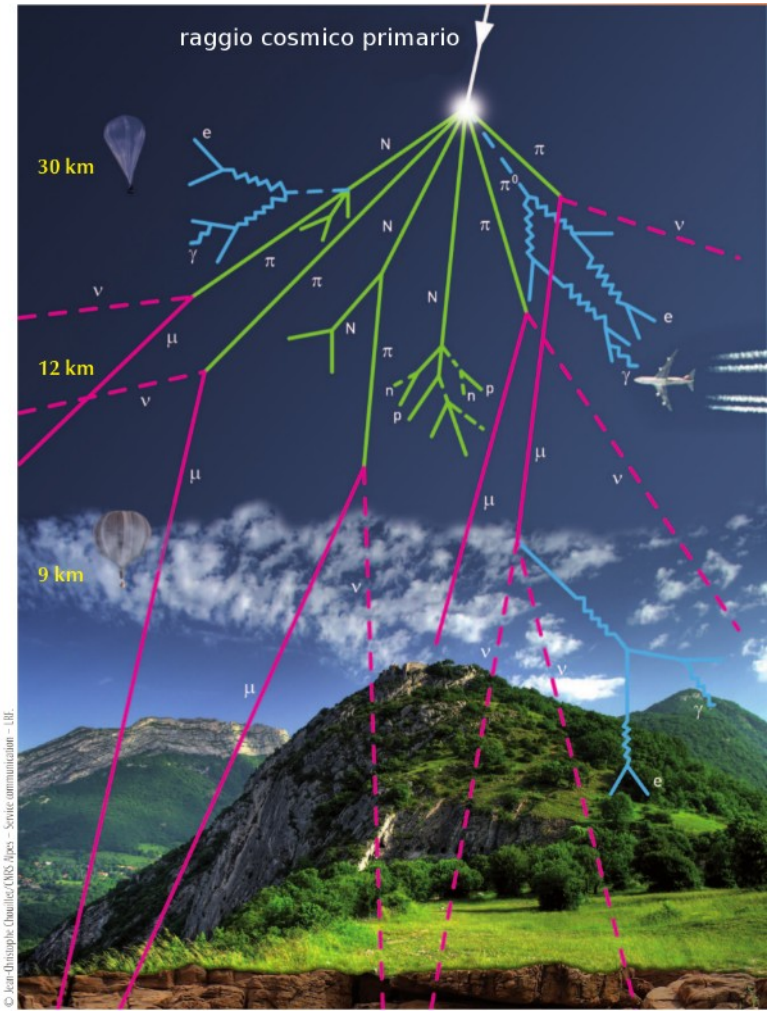


Esperimenti con gli acceleratori di particelle:

- i fenomeni da studiare/misurare sono prodotti in laboratorio in grandissimo numero e in condizioni controllate e riproducibili.

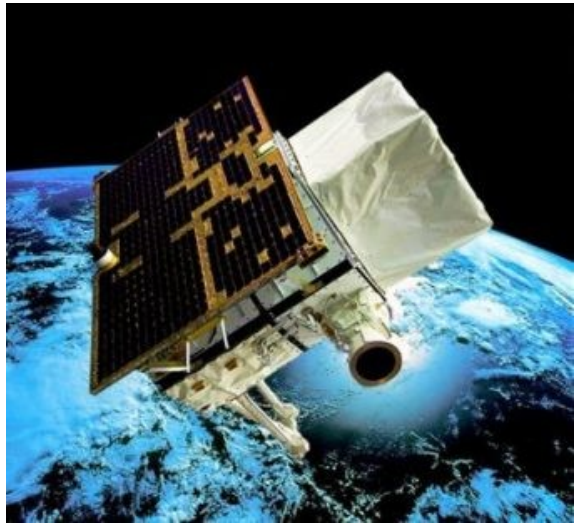
I raggi cosmici



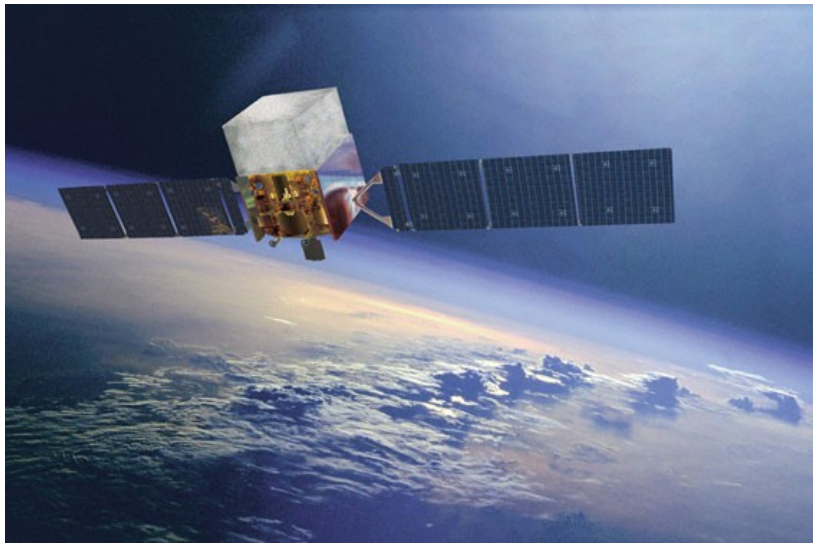


Esperimenti su satelliti

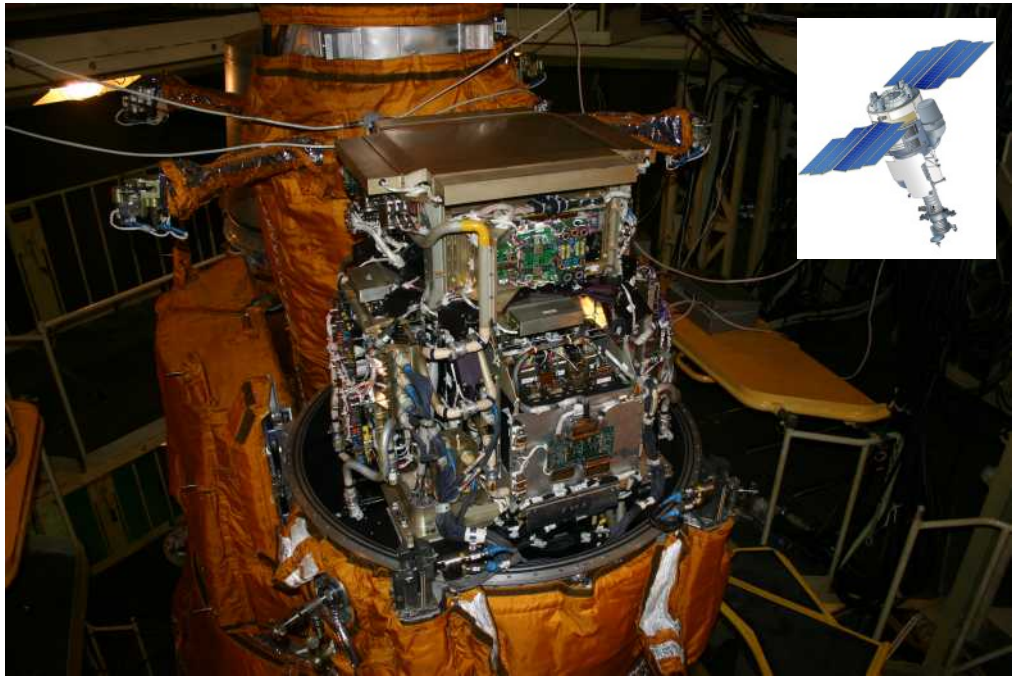
- AGILE

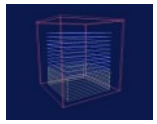


- Fermi-LAT



- PAMELA

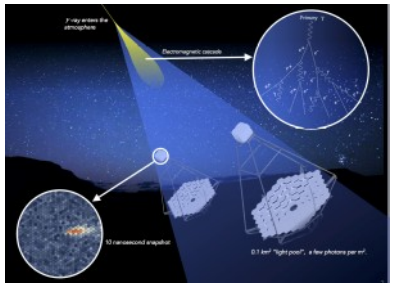




approfondimento nel LAB1

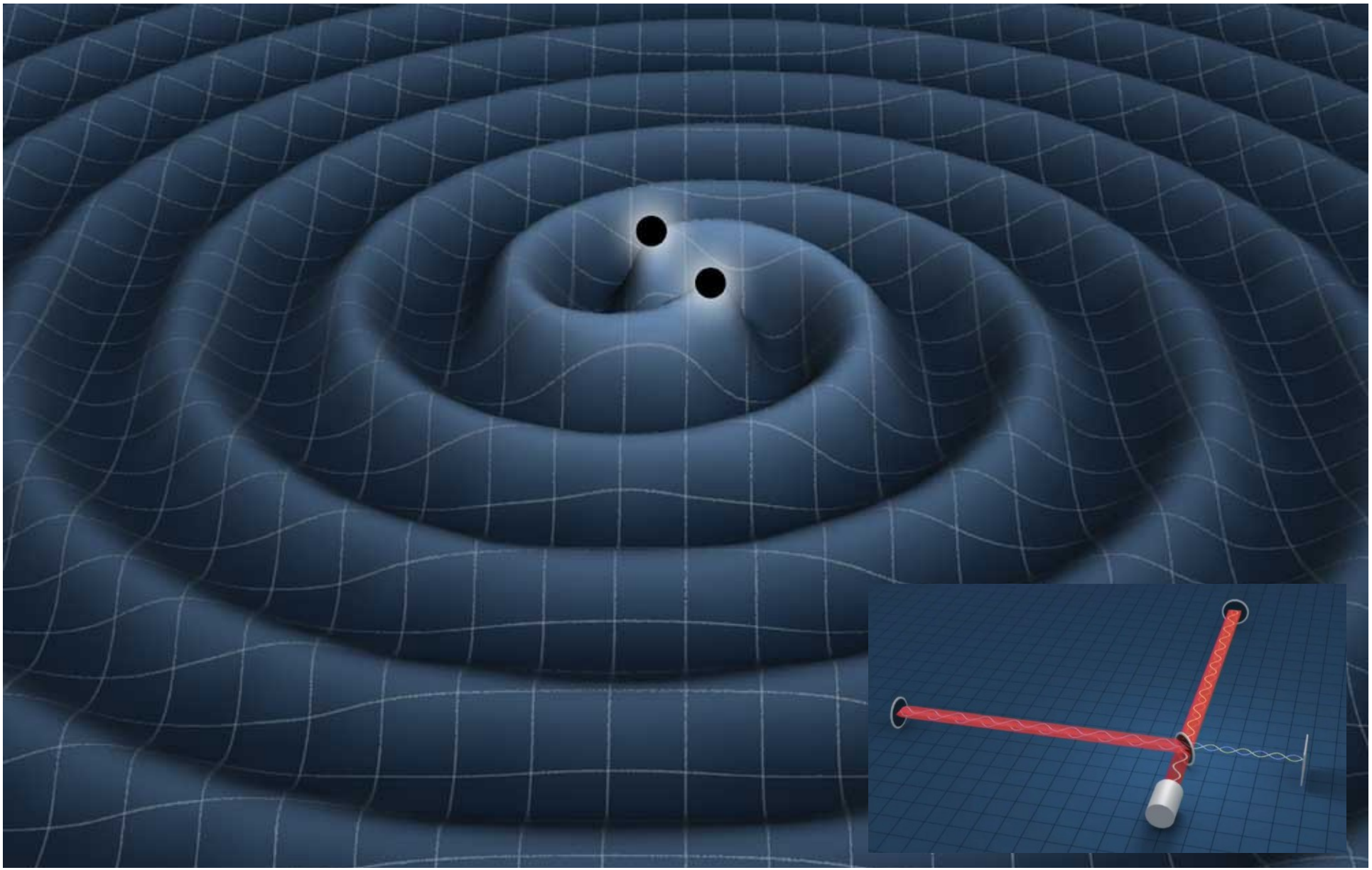
Esperimenti a terra

- MAGIC (La Palma, Spagna)

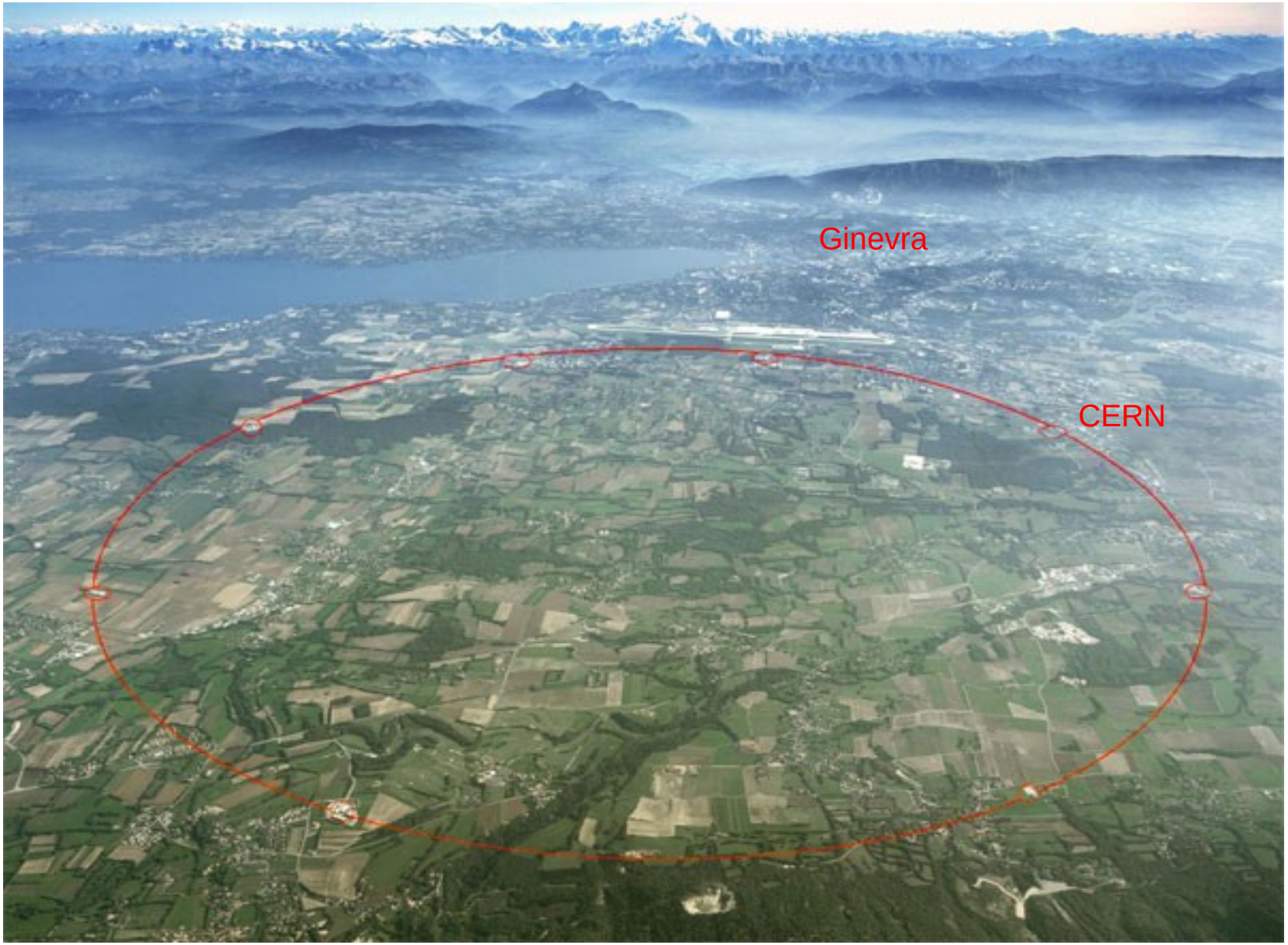


- CTA (La Palma, Spagna e Paranal, Cile)

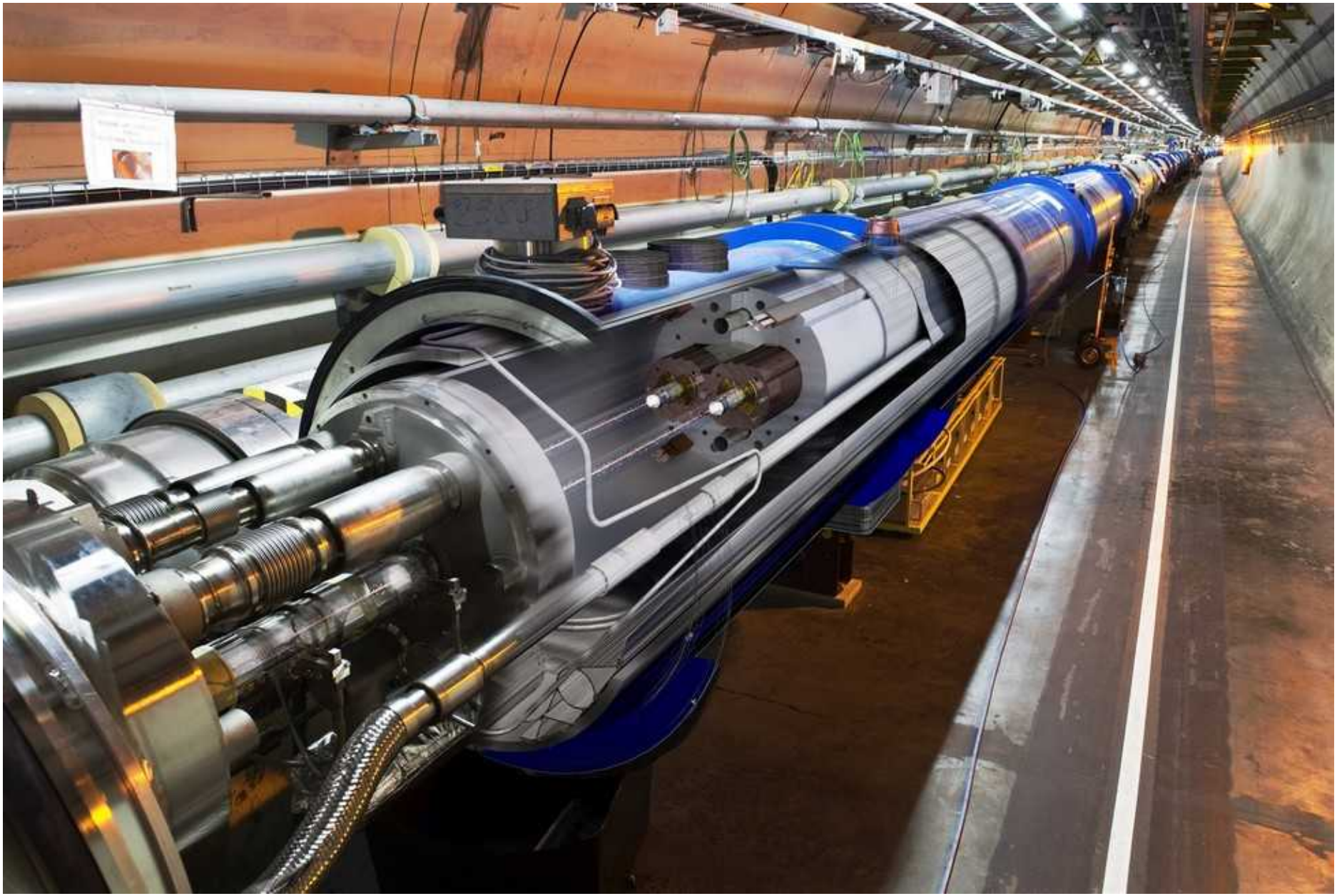
Onde gravitazionali



Il *Large Hadron Collider* del CERN

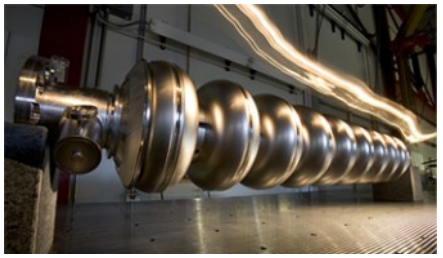


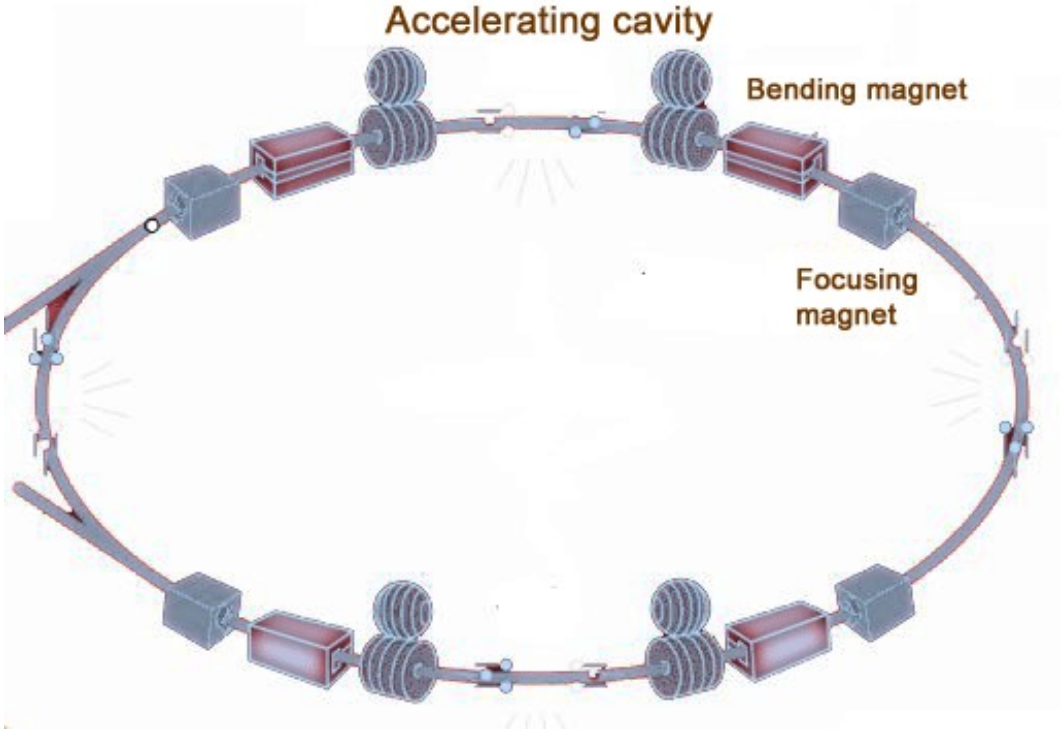
Il tunnel di LHC



Acceleratori circolari (sincrotroni)

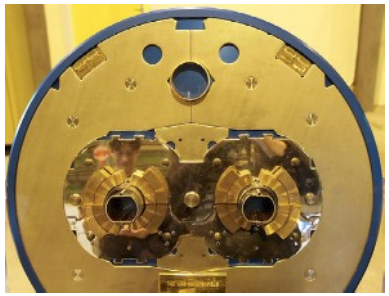
cavità risonanti a radiofrequenza



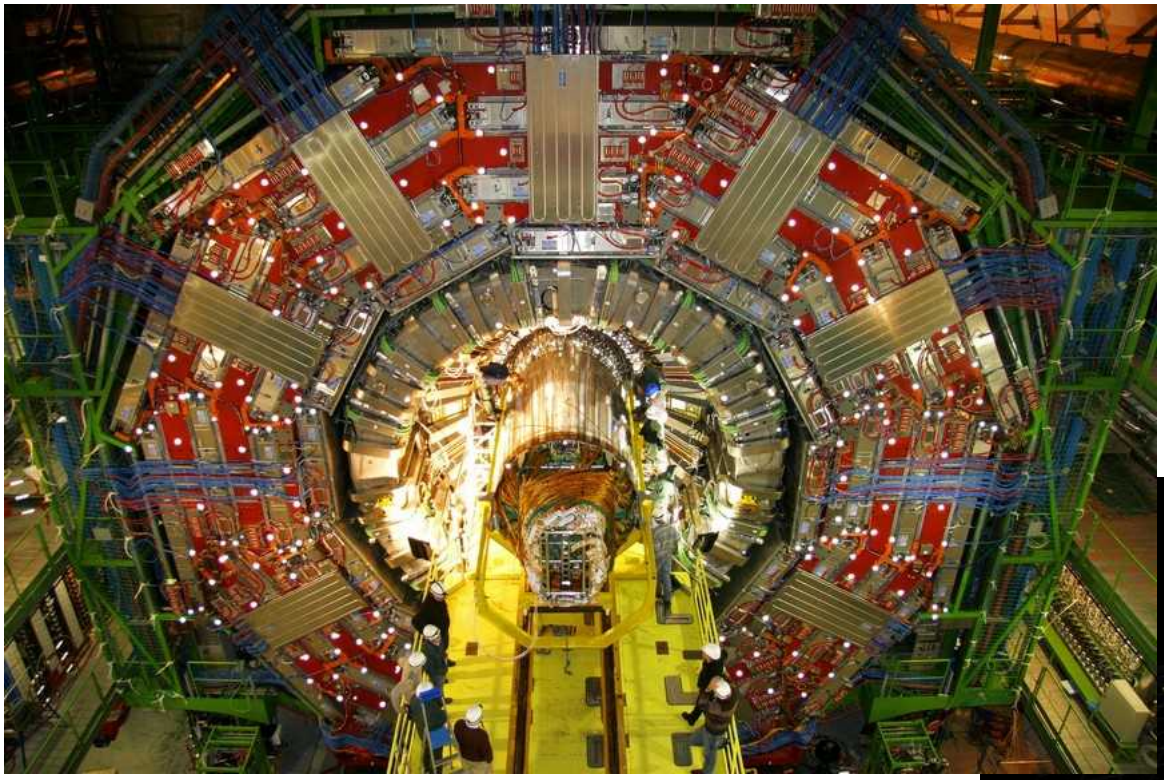


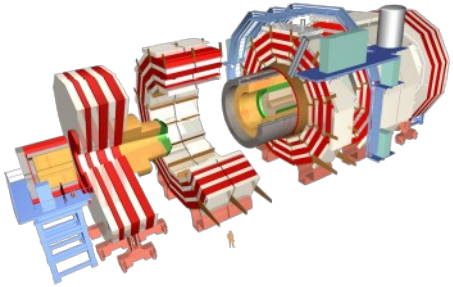
quadrupoli

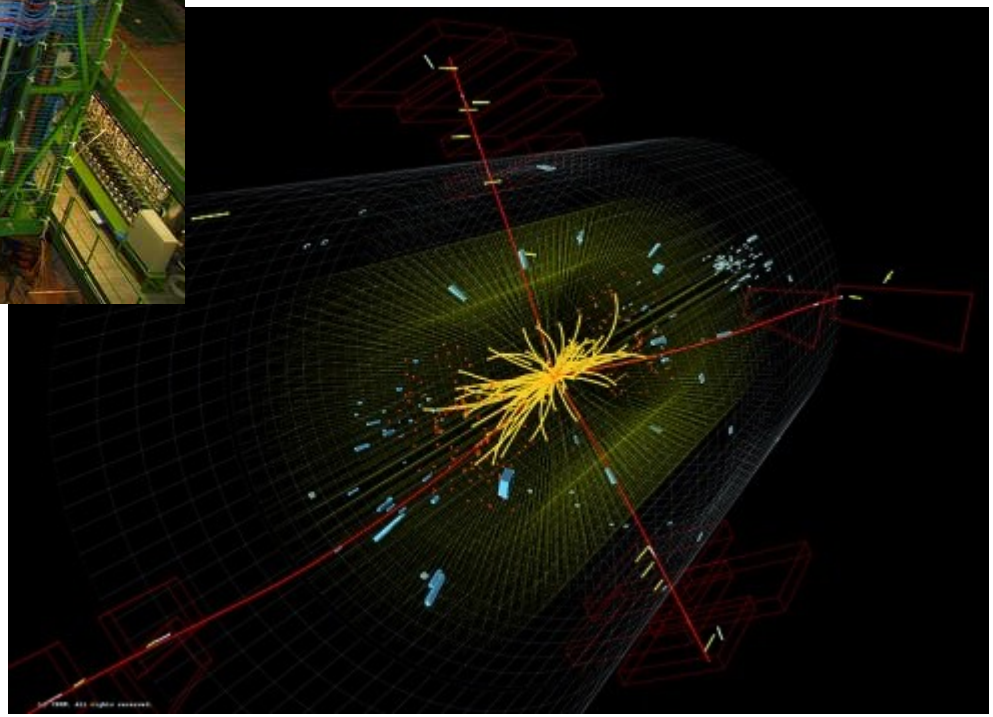
dipoli



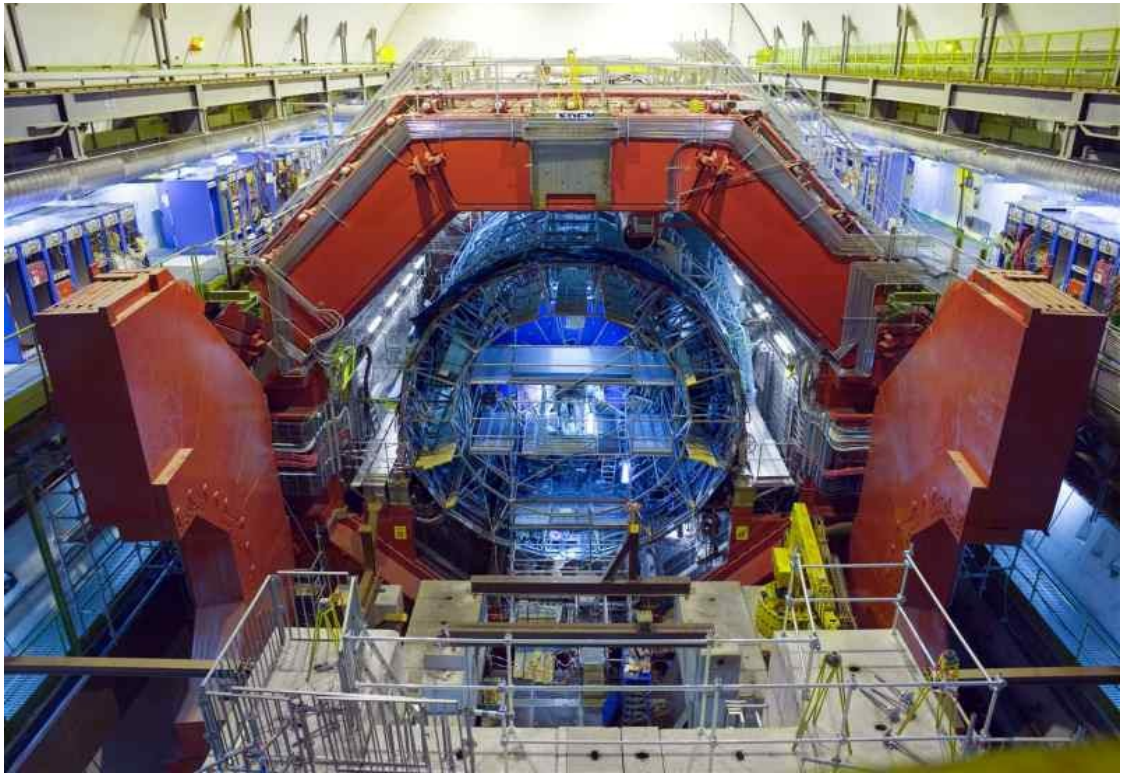
CMS al CERN

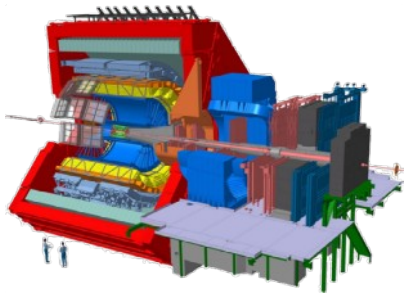


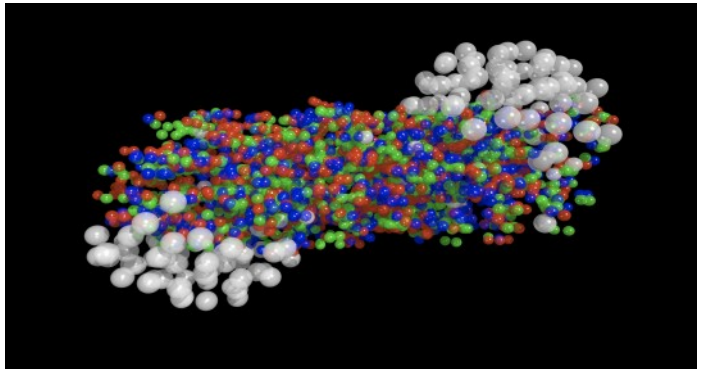


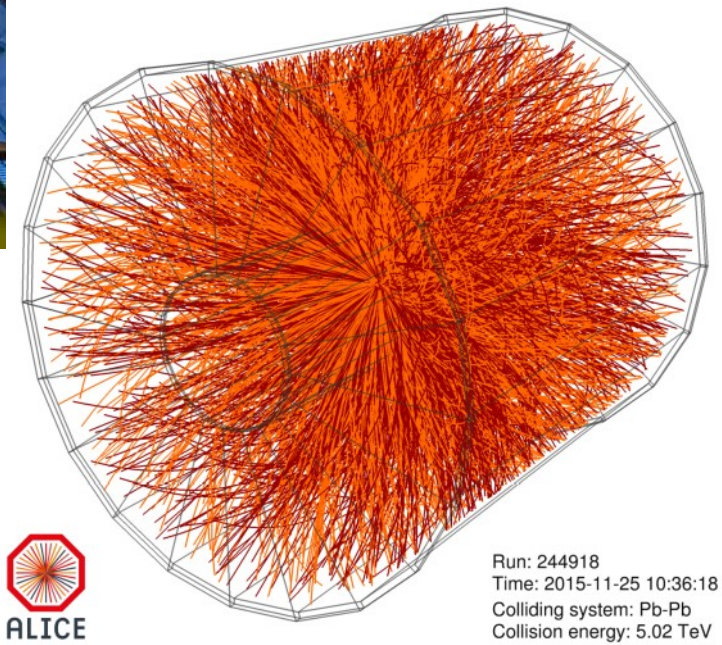


ALICE al CERN

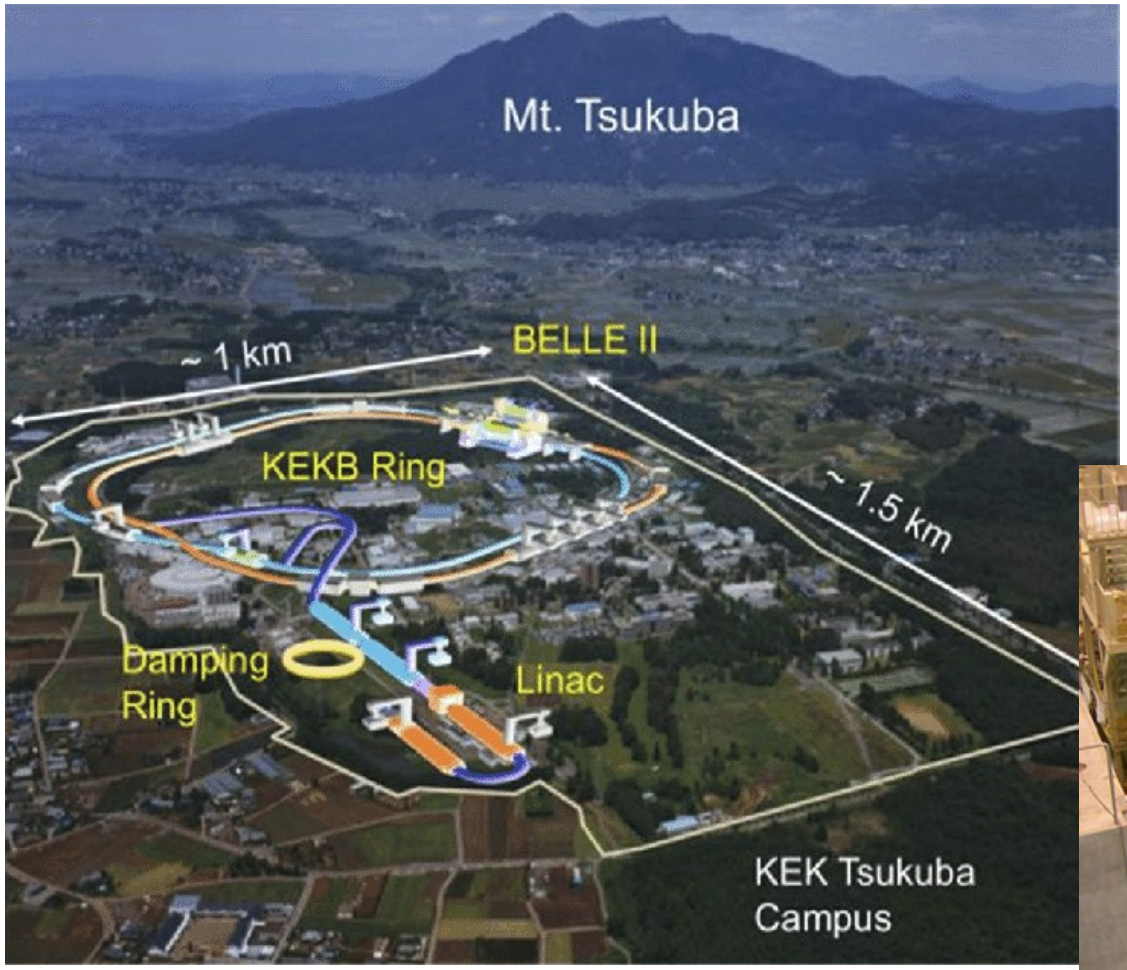


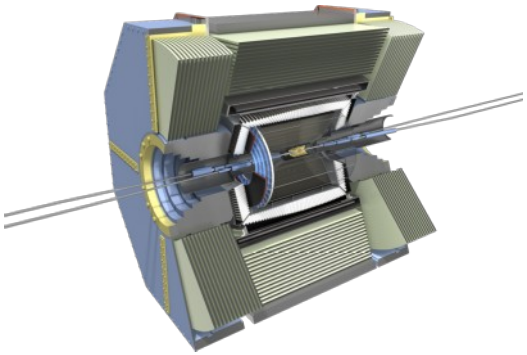


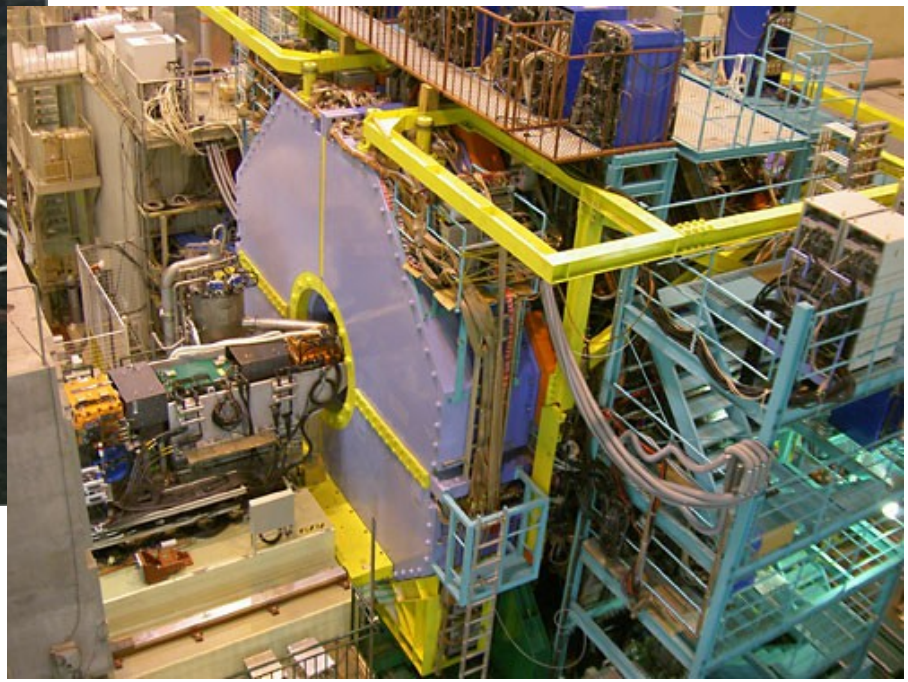


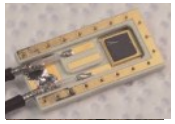


Belle 2 a KEK



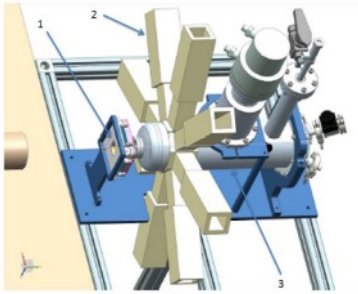


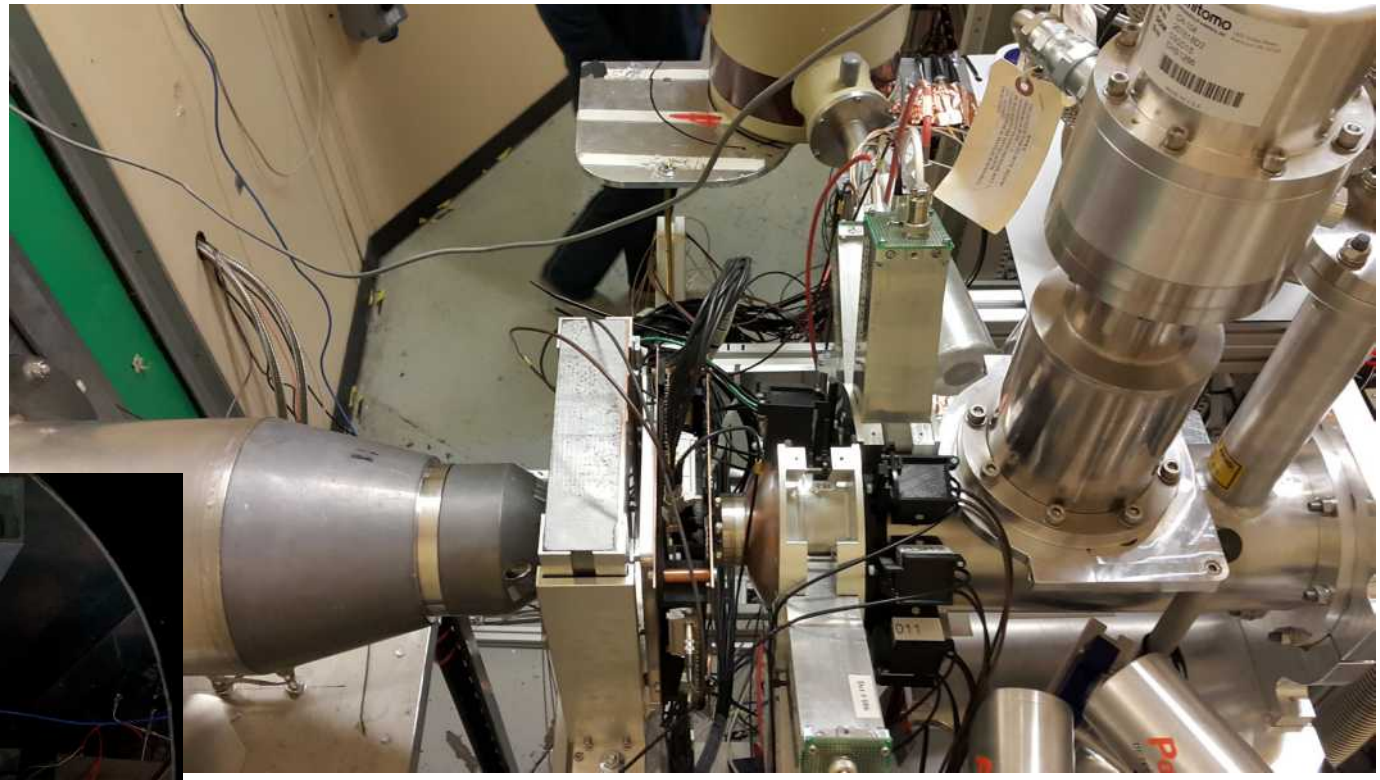


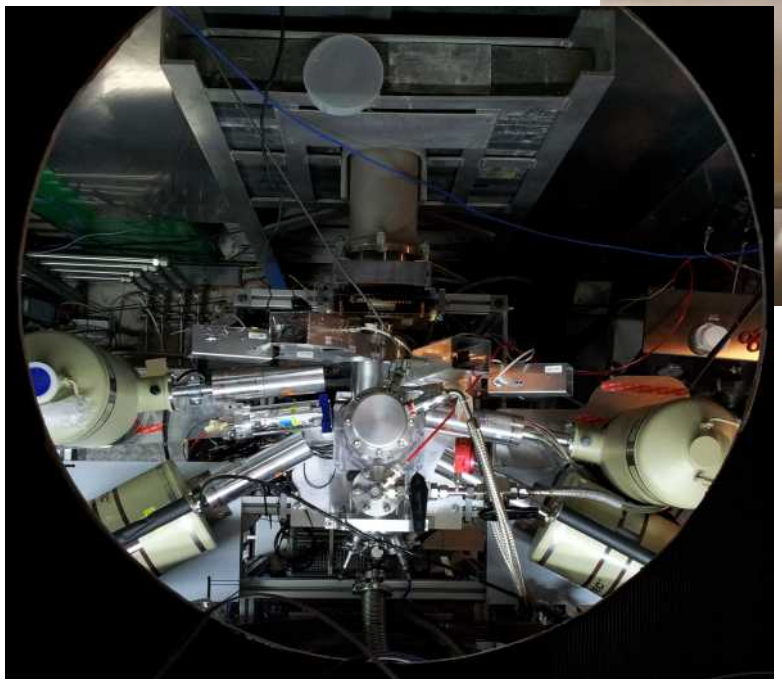


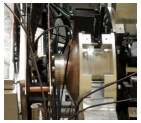
approfondimento nel LAB4

FAMU a RAL



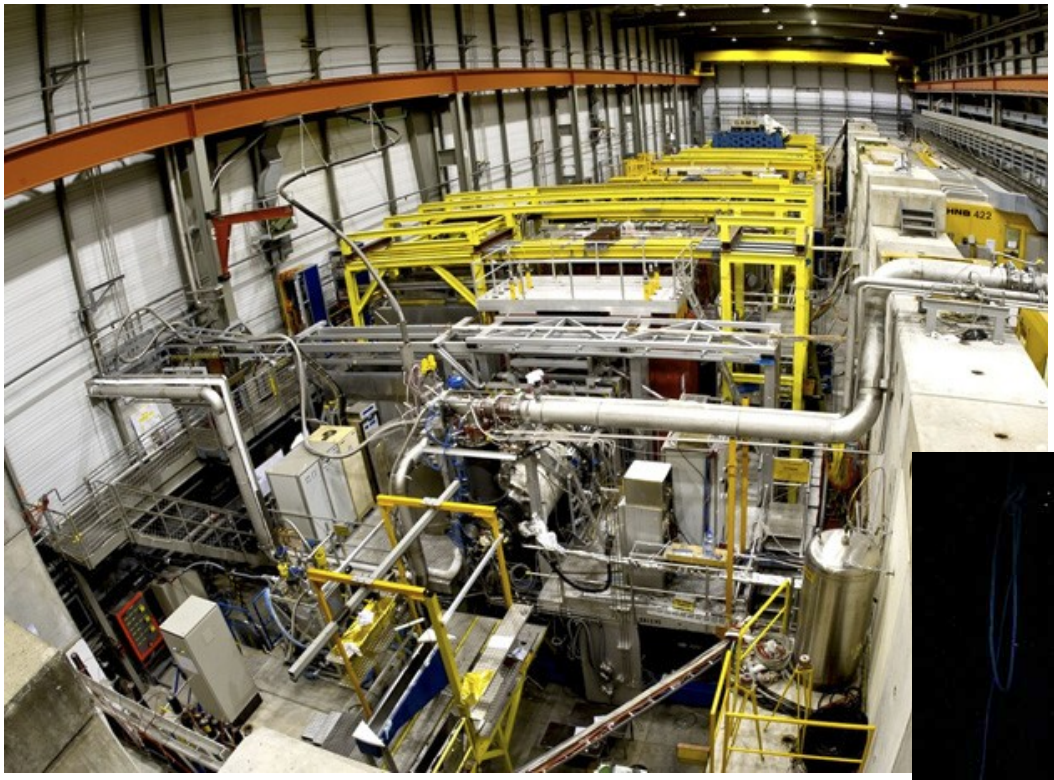


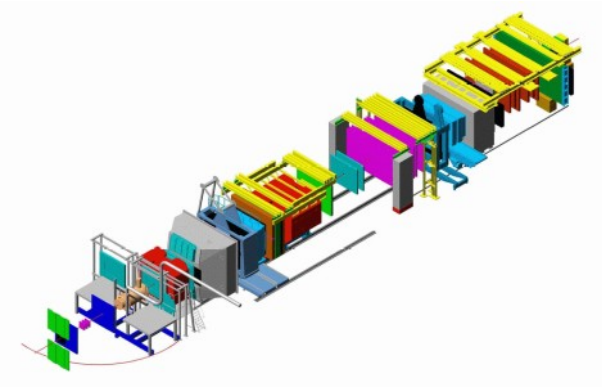


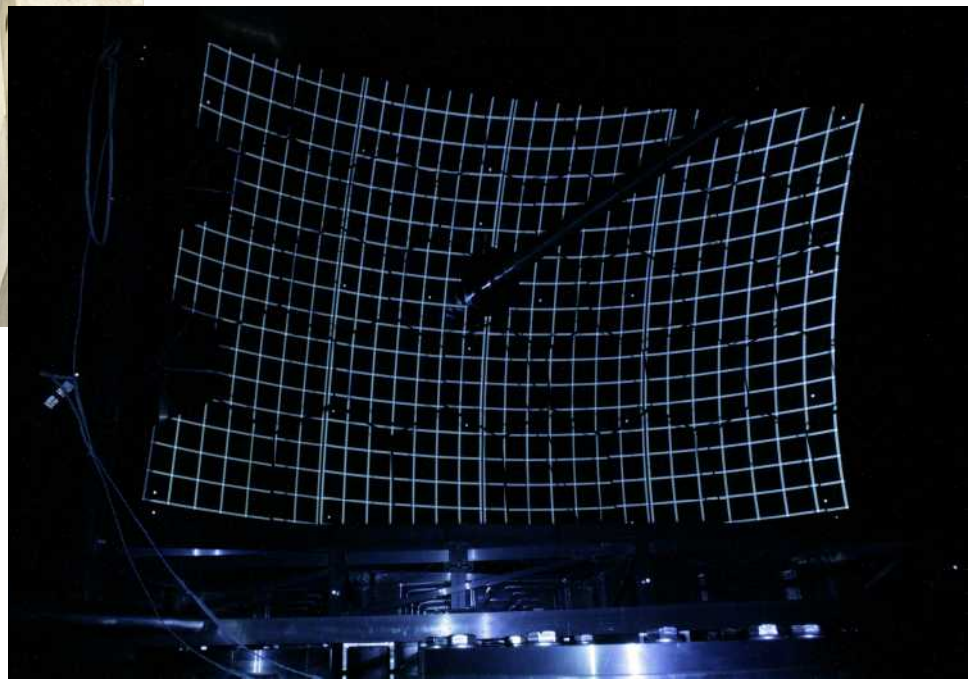


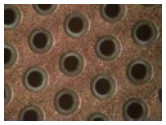
approfondimento
nel LAB3

COMPASS al CERN



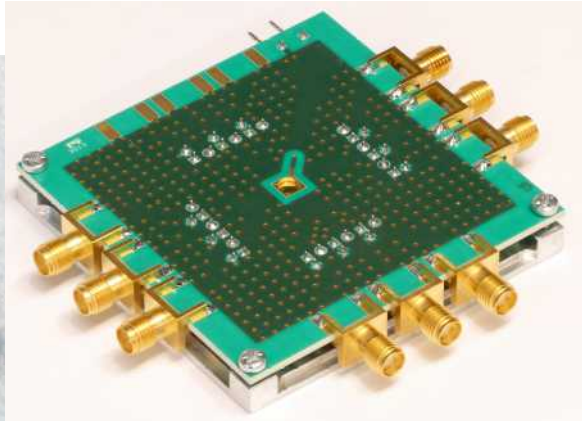


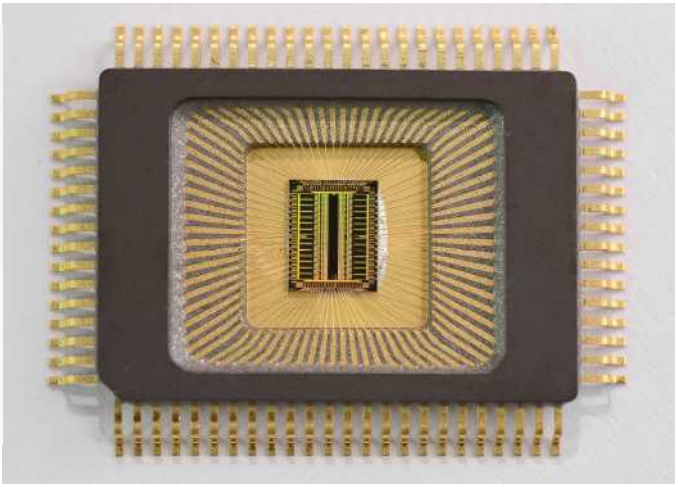


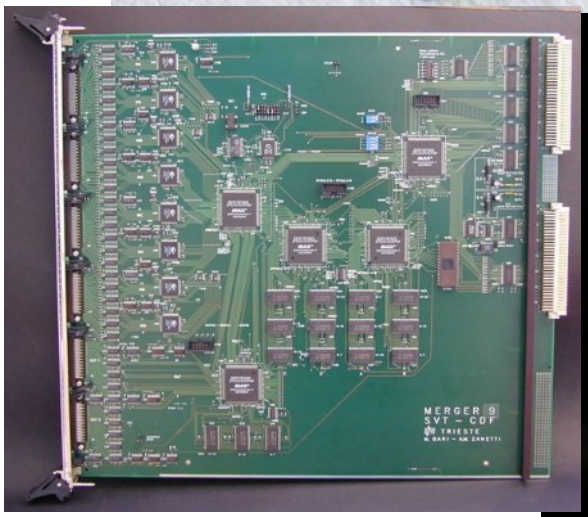


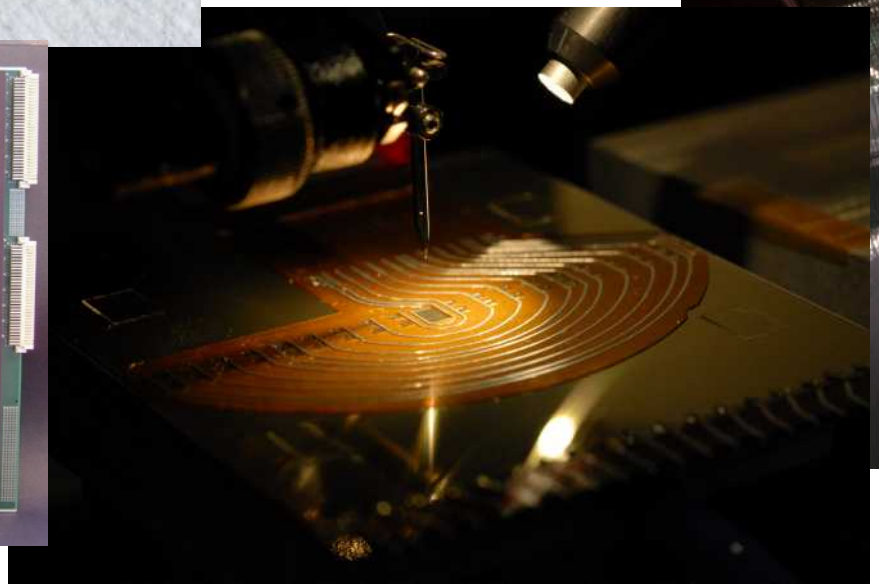
approfondimento
nel LAB5

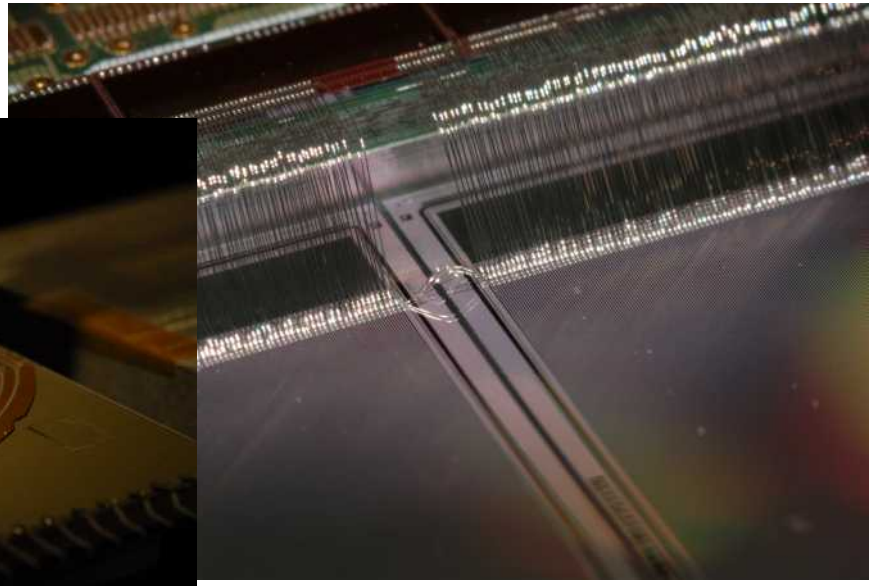
Sensori al silicio ed elettronica



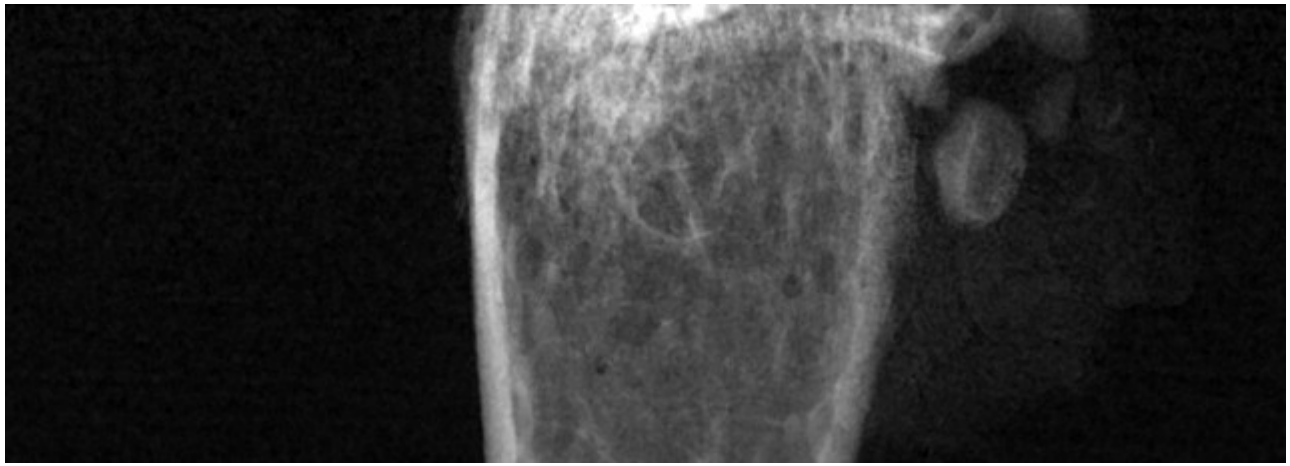


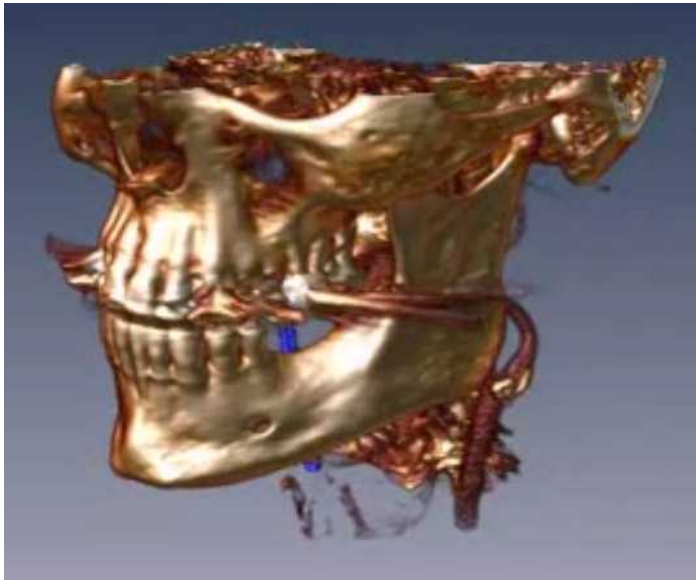


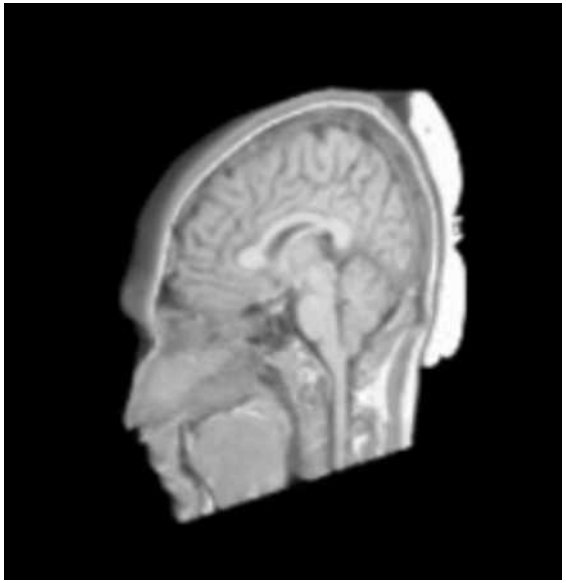


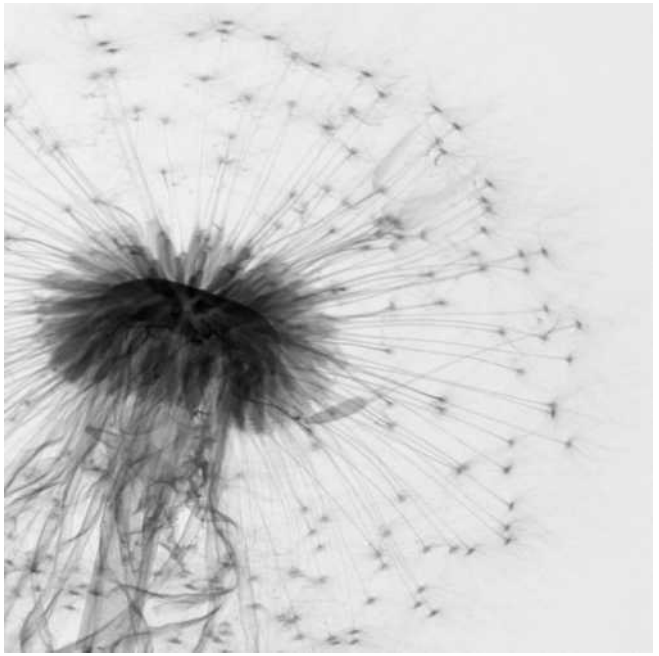


Imaging per Fisica Medica









approfondimento nel LAB2