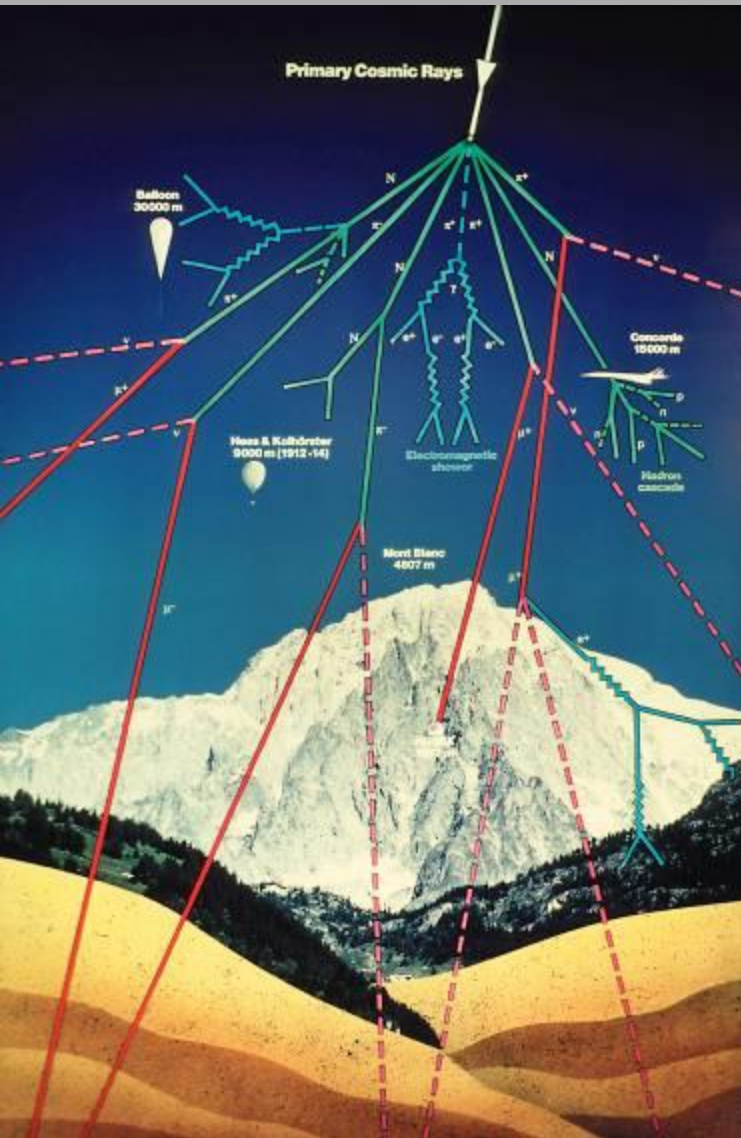
An aerial photograph of a vast valley, likely the Jura region in Switzerland, with a red circle highlighting the area where the CERN particle accelerator is located. In the background, there are snow-capped mountains under a clear blue sky. The text is overlaid on the image in white.

CERN a European Collaborative Project and a Centre for Particle Physics

Torsten Åkesson

From cosmic rays ... to CERN



“Über Beobachtungen der durchdringenden Strahlung bei sieben Freiballonfahrten“ (Hess, 1912).



CERN was established to study these particles.

Particle Physics

The fundamental principles governing our world; forces and basic constituents. The conceptual picture is quantified by mathematically formulated theories (before called Laws of Nature).

Evolves through experiments, development of theories and models. Today's theory is the Standard Model which has an exceptional predictive power, but is incomplete.

We explore the predictions of the Standard Model and seek a more complete understanding, i.e. Beyond the Standard Model.

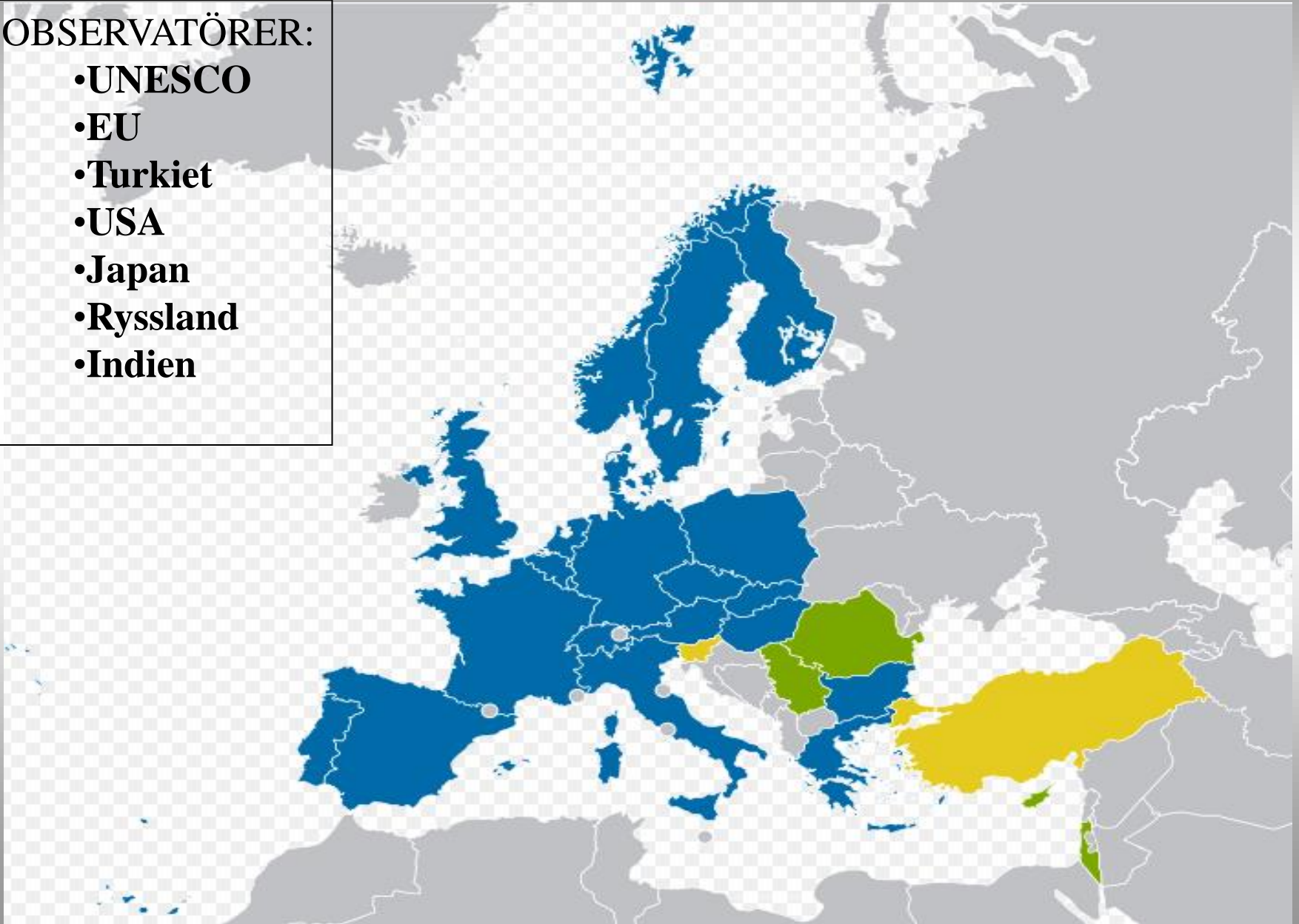
Convention

- ◆ **1954: An International Organization with two related missions:**
 - ◆ *Construction and operation of laboratories for research with high energy particles including cosmic rays*
 - ◆ *Particle Accelerators*
 - ◆ *Auxilliary equipment*
 - ◆ *Organization and sponsring of international collaboration in the field, including outside the CERN laboratories*
 - ◆ *Theoretical research;*
 - ◆ *Contacts among researchers, exchange and training*
 - ◆ *Collaborate with, and advice, other research institutions*
 - ◆ *Research with cosmic rays*

Member States

OBSERVATÖRER:

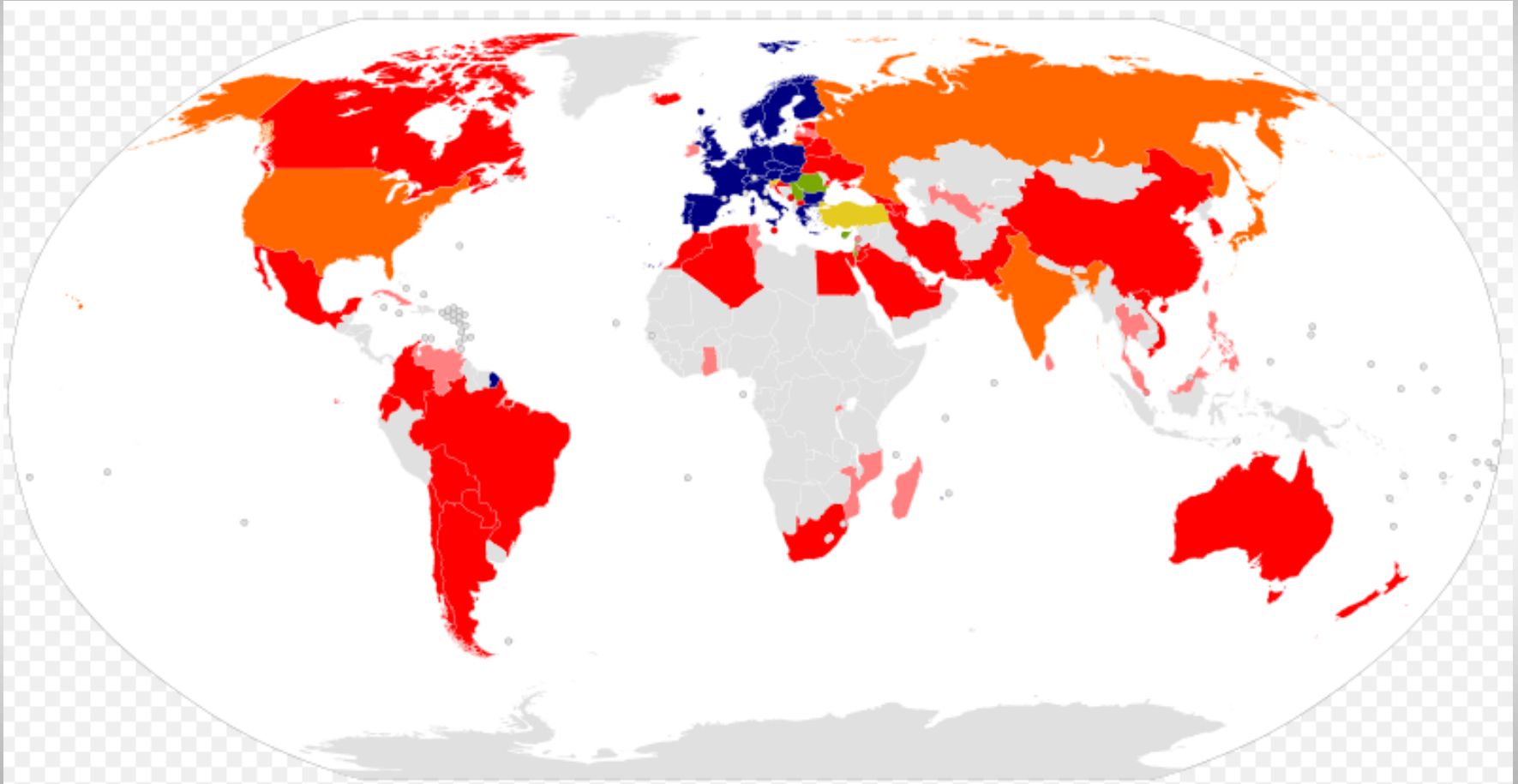
- UNESCO
- EU
- Turkiet
- USA
- Japan
- Ryssland
- Indien



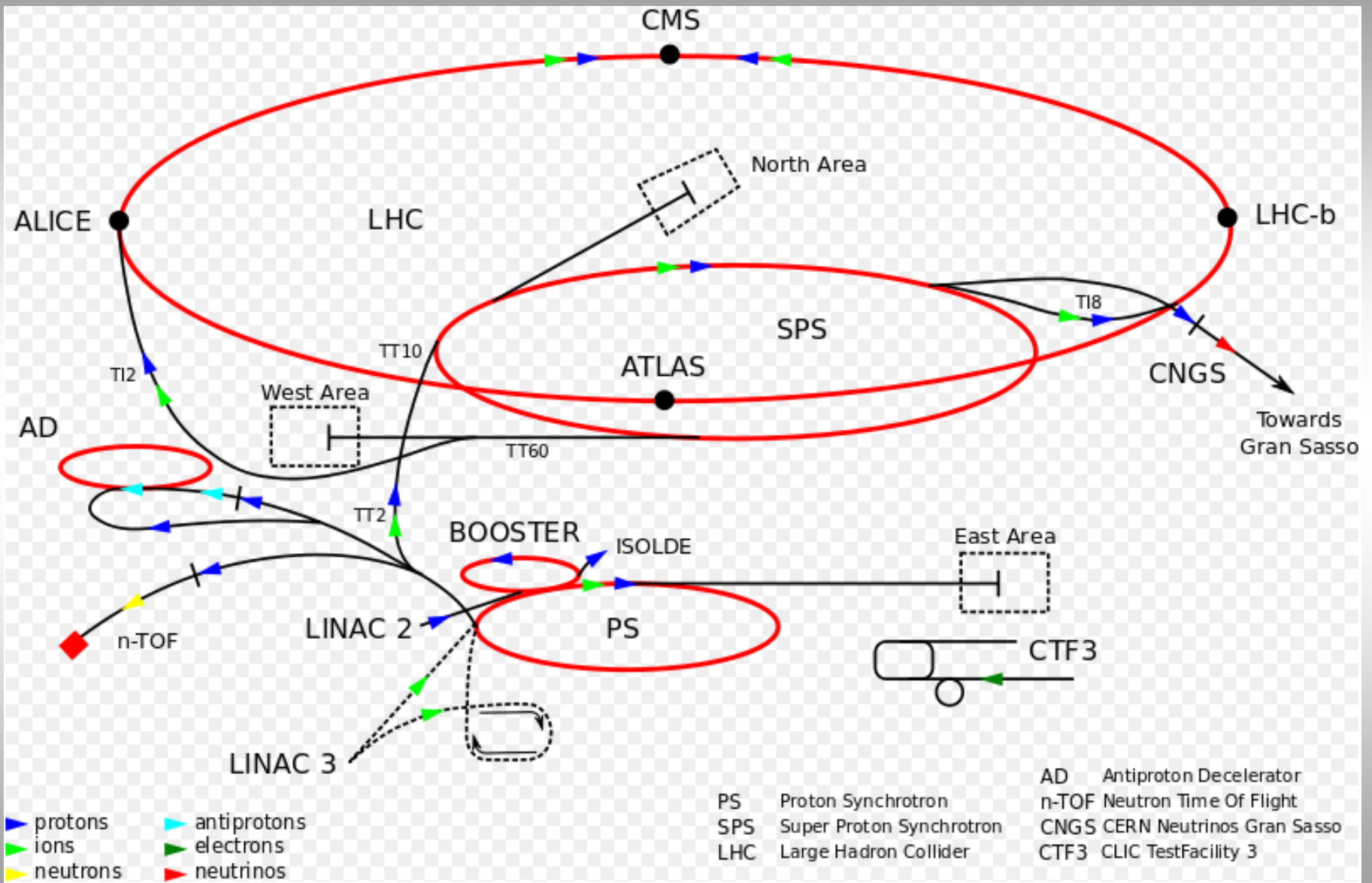
Resources

- ◆ **Annual budget ~ 8,2 miljarder kronor**
 - ◆ Sweden ~ 208 miljoner kronor
- ◆ **Employees: ~ 2'400 + 1'500 part time**

10'000 researchers use CERN: 50% of the world Particle Physicists



Infra Structure



Different activities at CERN

Large Hadron Collider



Accelerator R&D



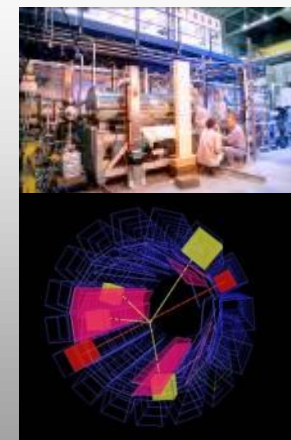
Theoretical Physics



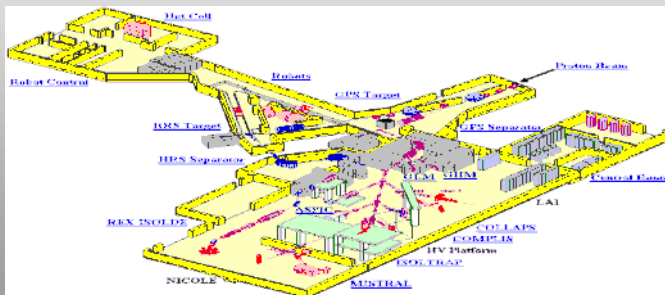
Grid computing



Forskning med antimateria



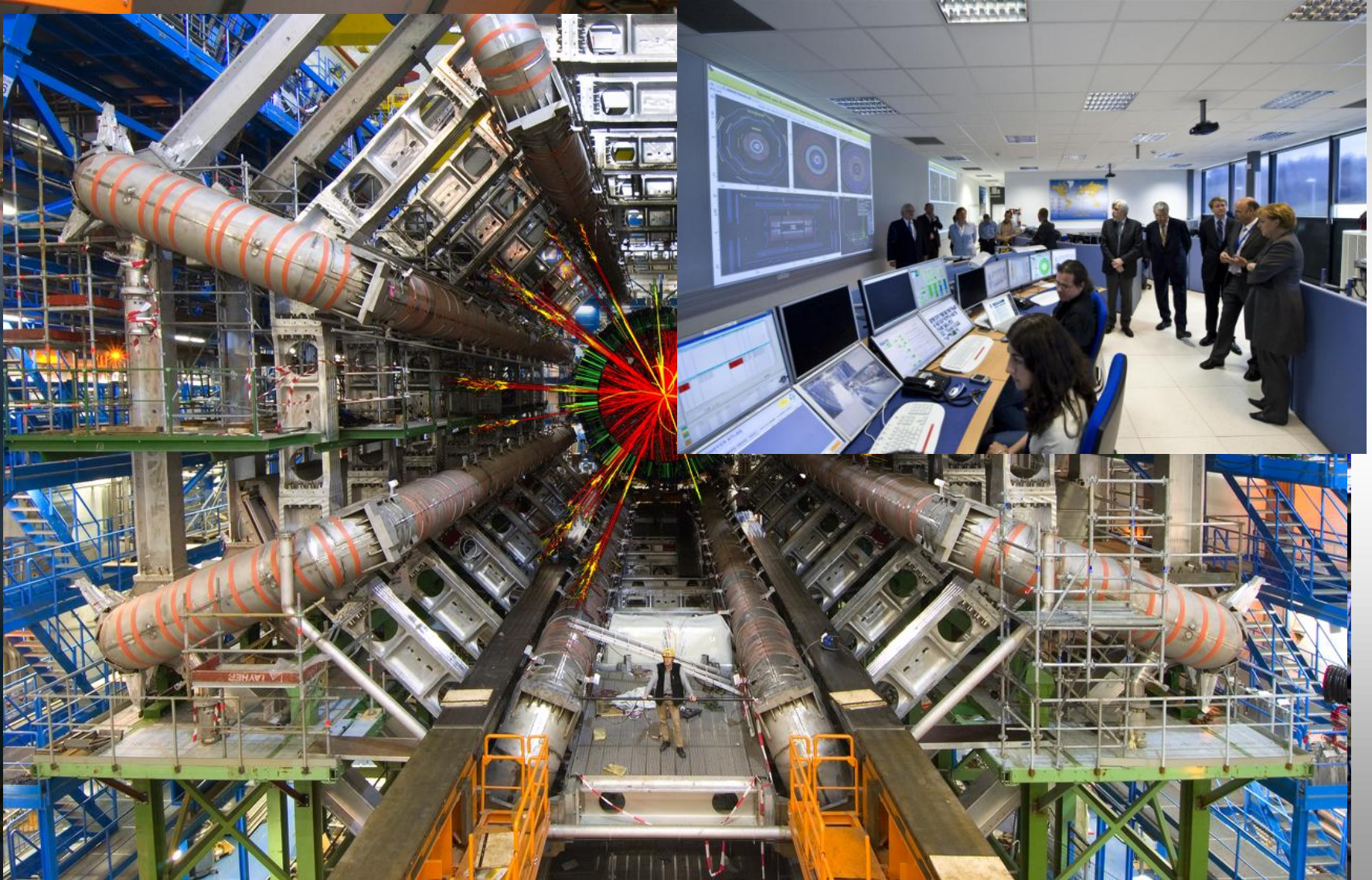
Beams with radioactive ions



Neutrino beam

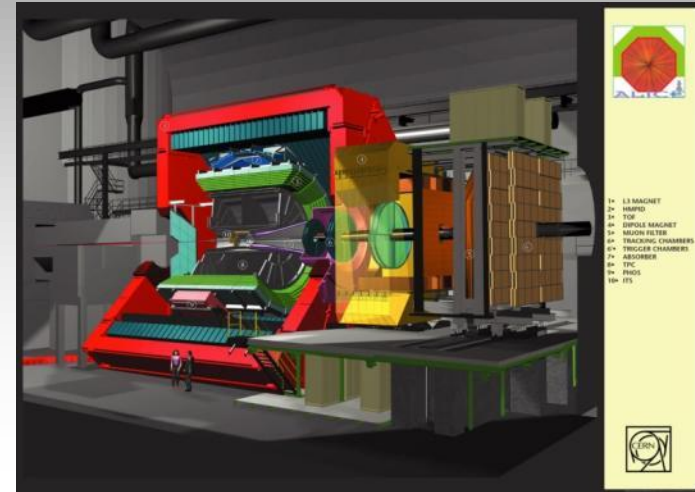


Accelerators supplied by CERN and experiments by research groups at Universities/Research Councils & CERN



Collaborations: Experiments at CERN

- ◆ Research groups with common scientific interest creates and operates experiments
 - ◆ 3'000 forskare
 - ◆ 50 länder
- ◆ CERN is legal entity fo the experiments
- ◆ Use CERN administrative infrastructure
- ◆ Formalized between CERN and the Research Councils



An Experiment

Global network for collaboration among scientists

Utvecklar, bygger utrustning som transporteras till CERN

