



CMS

LHCb



ALICE

ATLAS



Chemin des Grands Prés

L'Alfordon

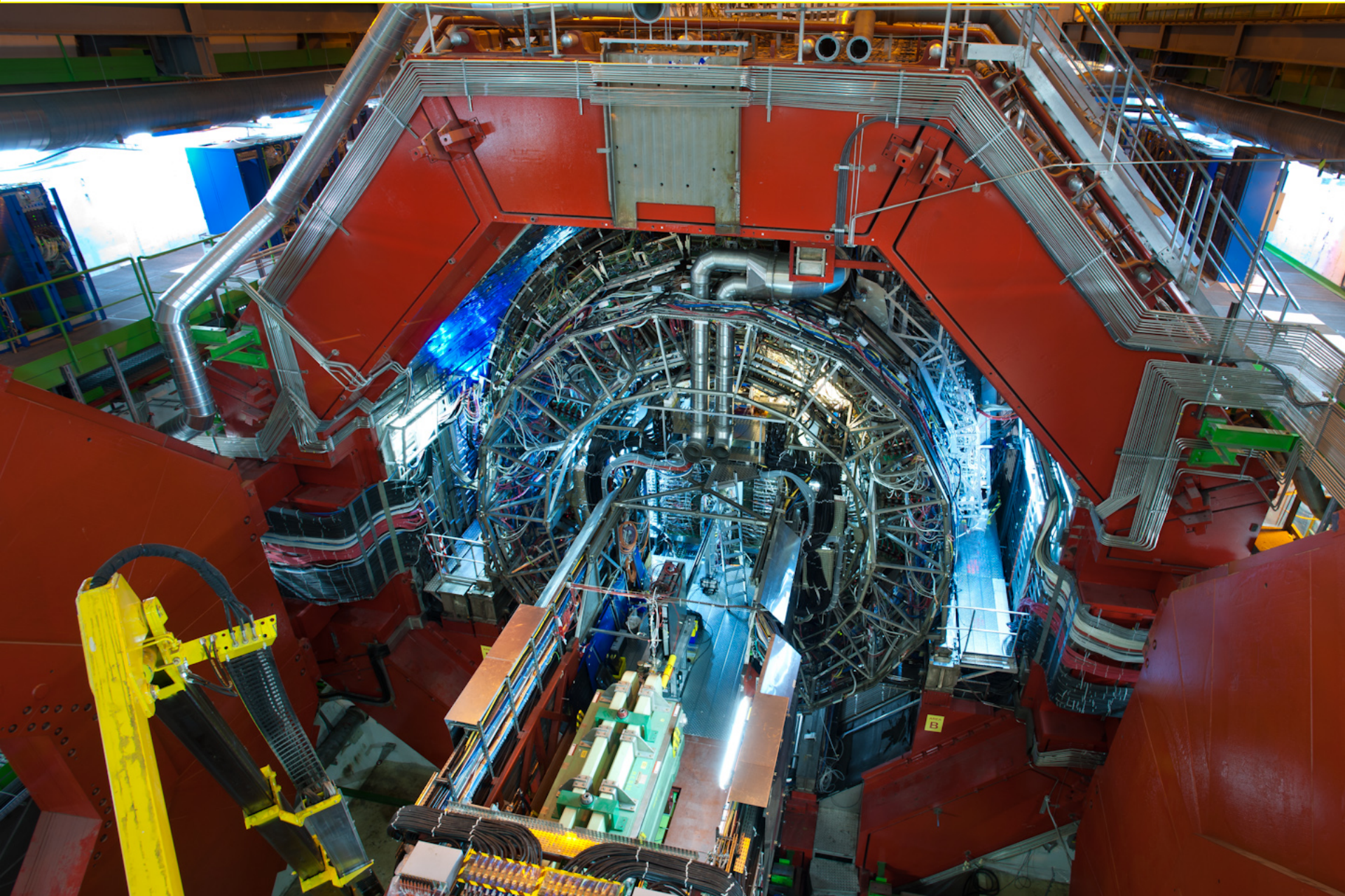
Punto 2 Cern

L'Alfordon

Google

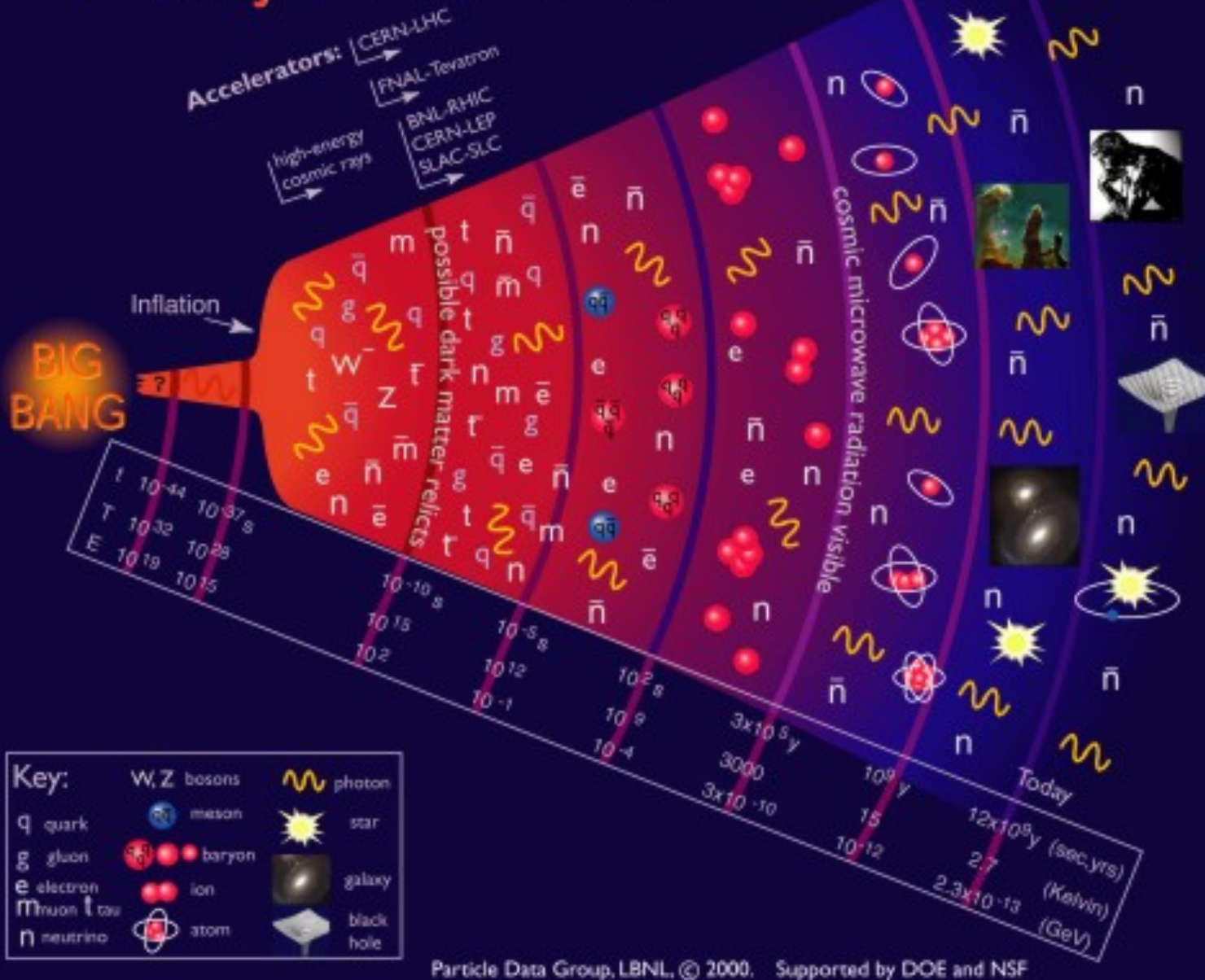
Map

ALICE : A Large Ion Collider Experiment



16 m x 16 m x 26 m 10 000 tons installed 56 m underground (@ point 2 of LHC)

History of the Universe



Millionths of a second after the big bang, all matter is made of free quarks and gluons,

THE QUARK GLUON PLASMA

As the universe cools and expands, the quarks and gluons are “imprisoned” for ever inside hadrons: from these, only protons and neutrons remain today

13.7 billion years ago the universe was born from a Big Bang

Little Bang

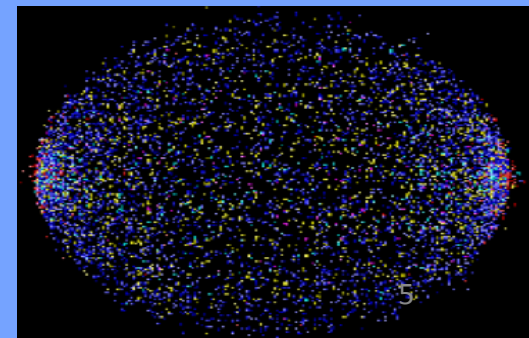
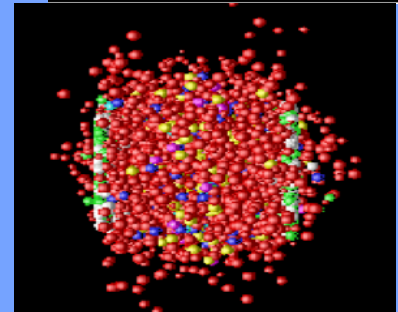
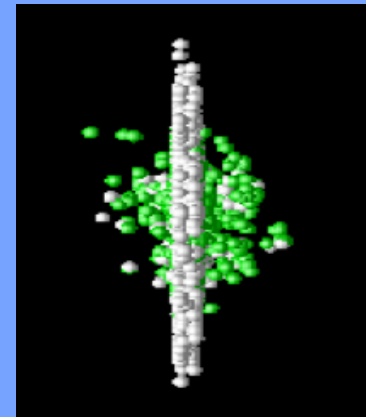
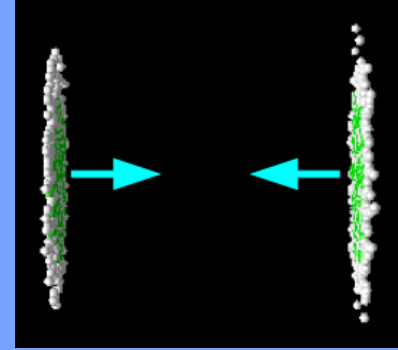
By colliding lead nuclei at very high energies we recreate the conditions of density and temperature which existed fractions of a second after the Big Bang

The protons and neutrons which constitute the lead nuclei melt liberating the quarks and gluons which are bound inside them

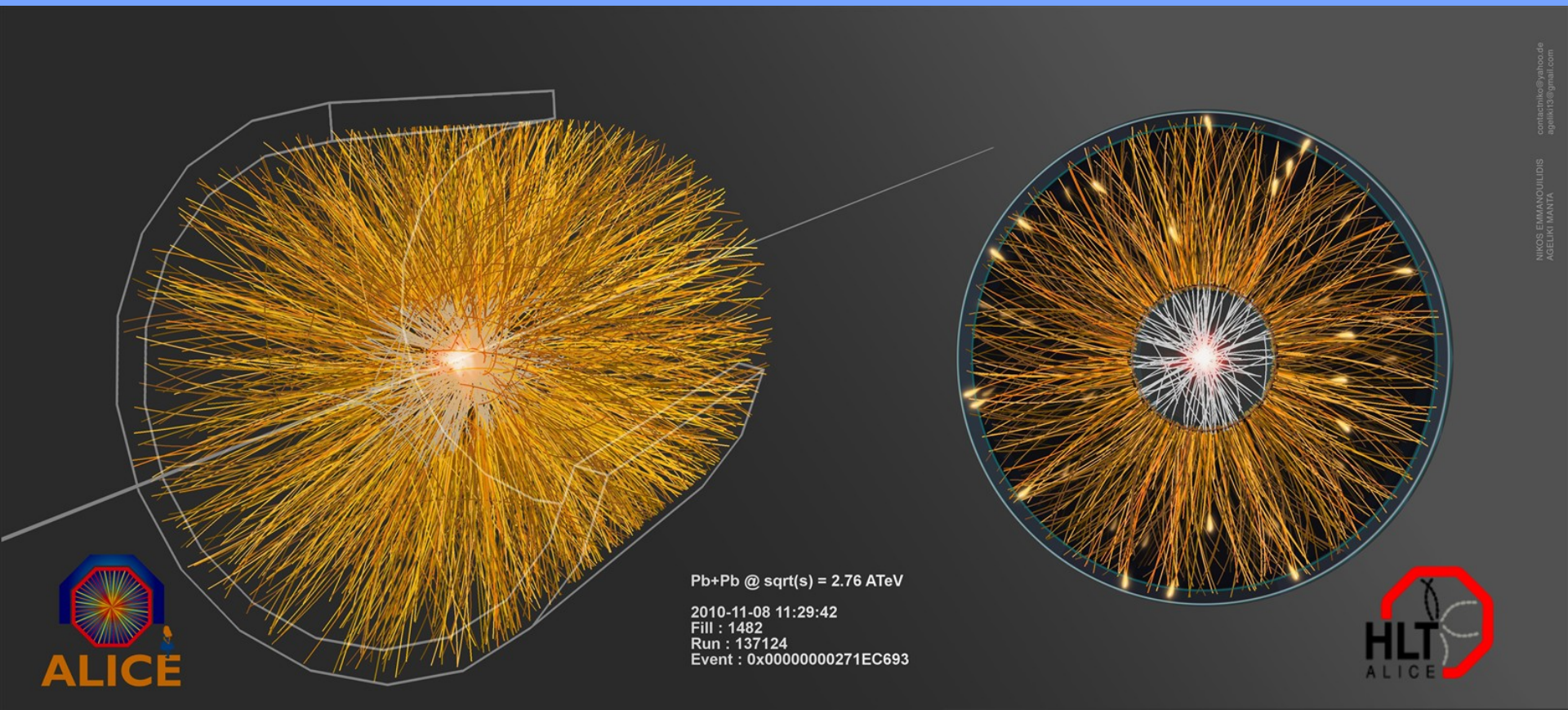
A new state of matter is created : the QUARK GLUON PLASMA

By studying its properties

- We will understand better the processes which took place during the first fractions of a second in the life of the universe
- We will understand better the strong interaction and how the protons and neutrons acquire their mass



At LHC lead nuclei collide with an energy of 2.76 TeV/nucleon pair
13 times higher than the energy at which gold nuclei collide at RHIC (Relativistic Heavy
Ion Collider) at Brookhaven, USA (near New York)



Lead ion collisions produce thousands of new particles – here we see their traces