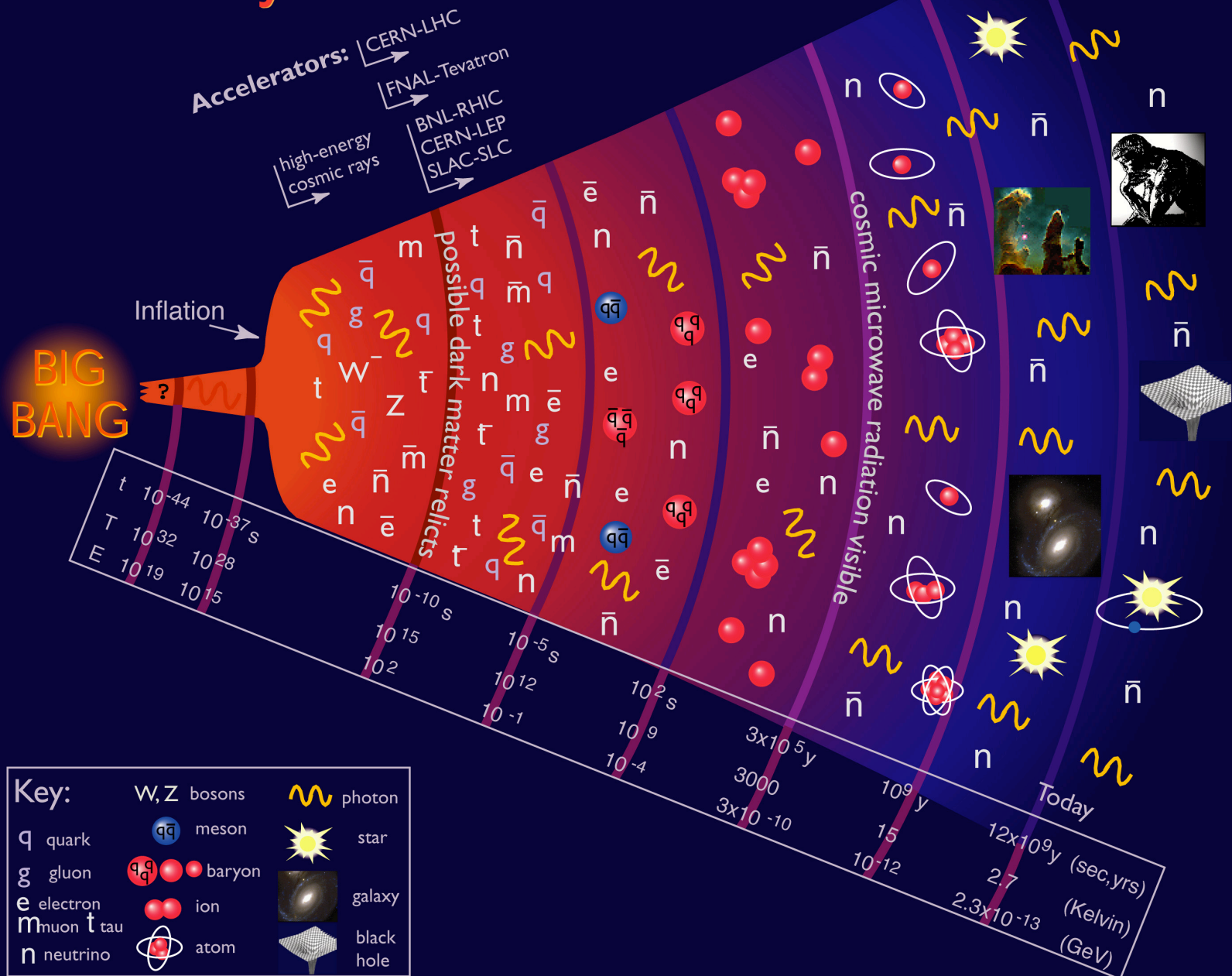
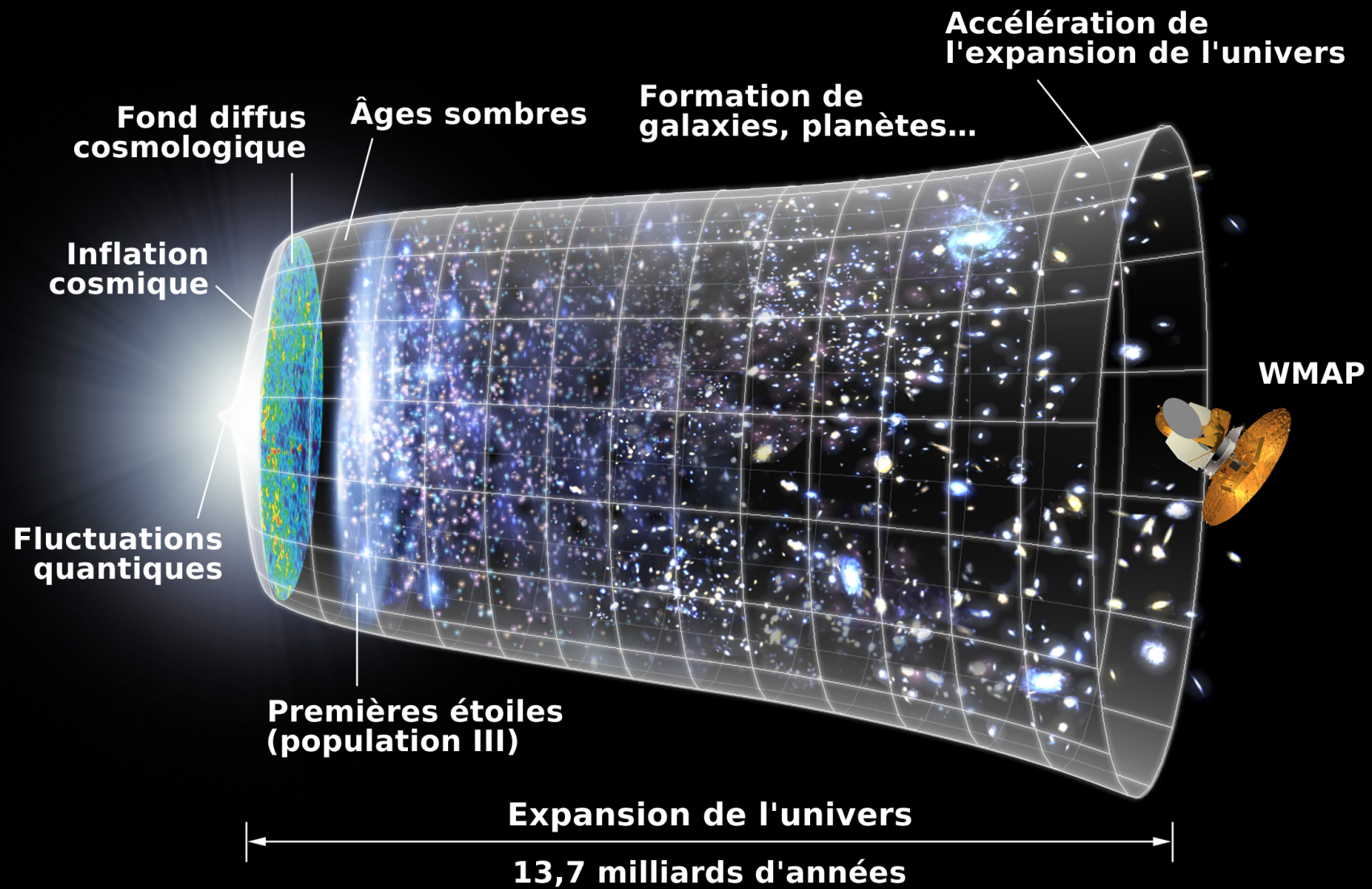
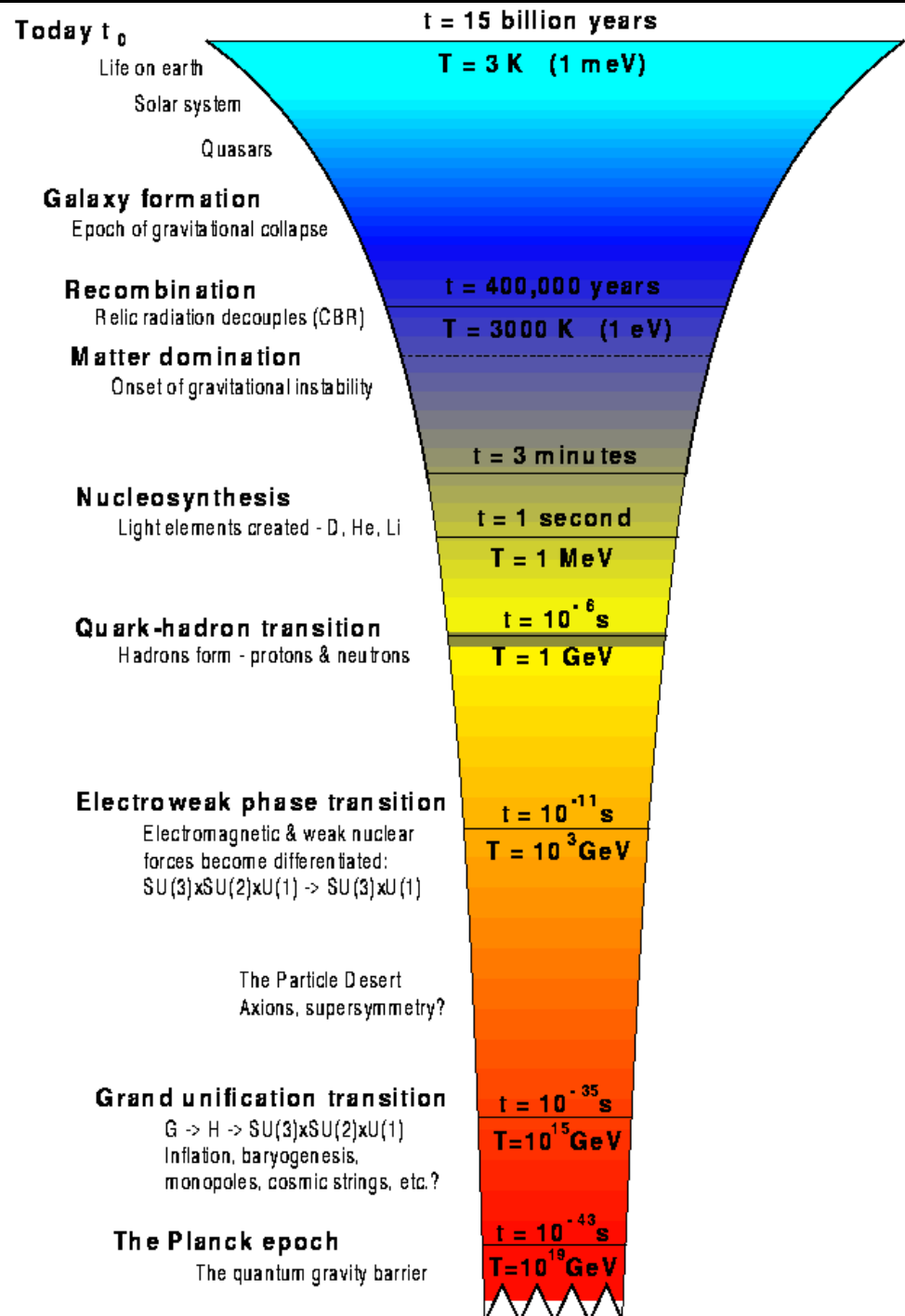
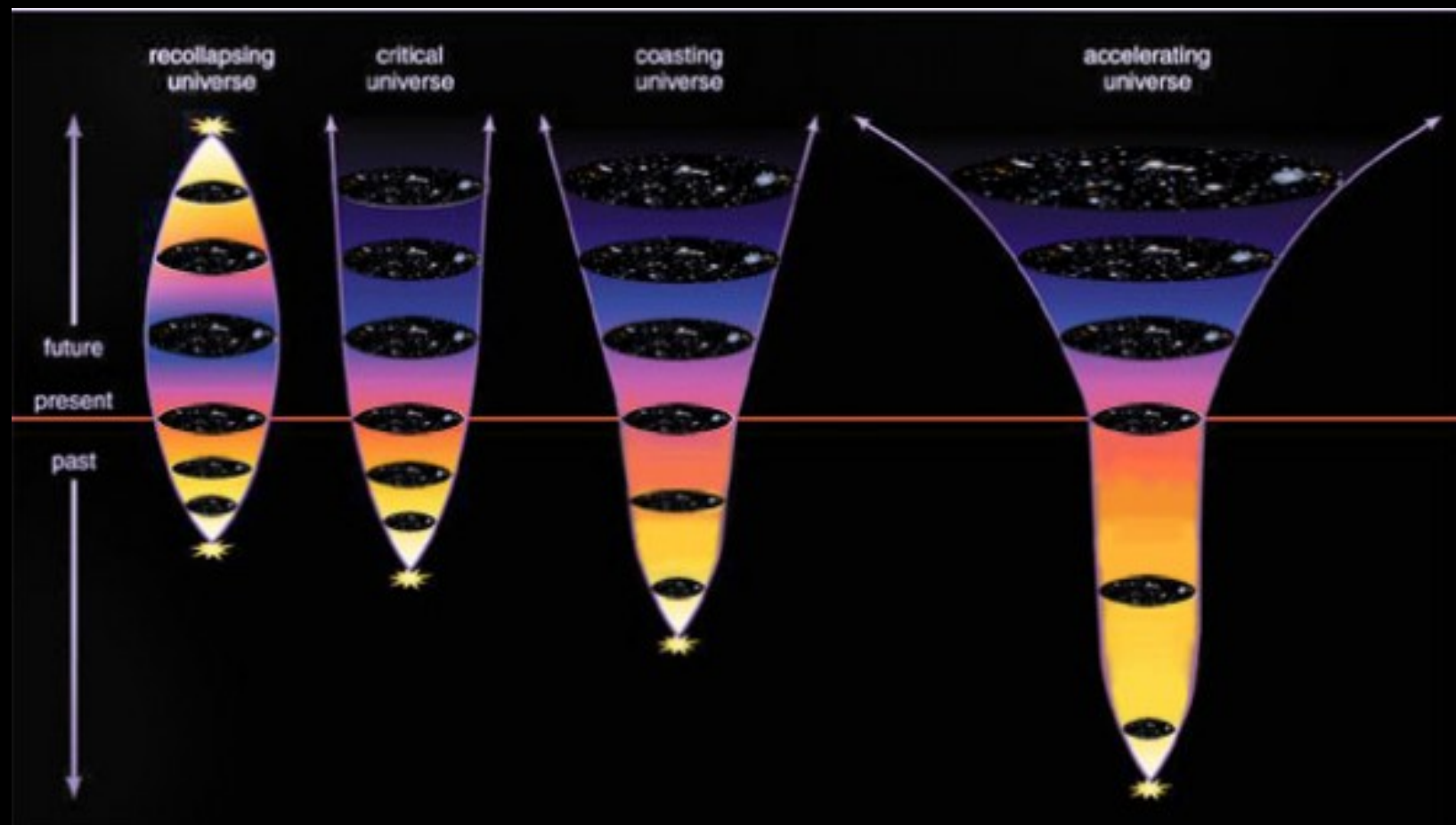


# History of the Universe

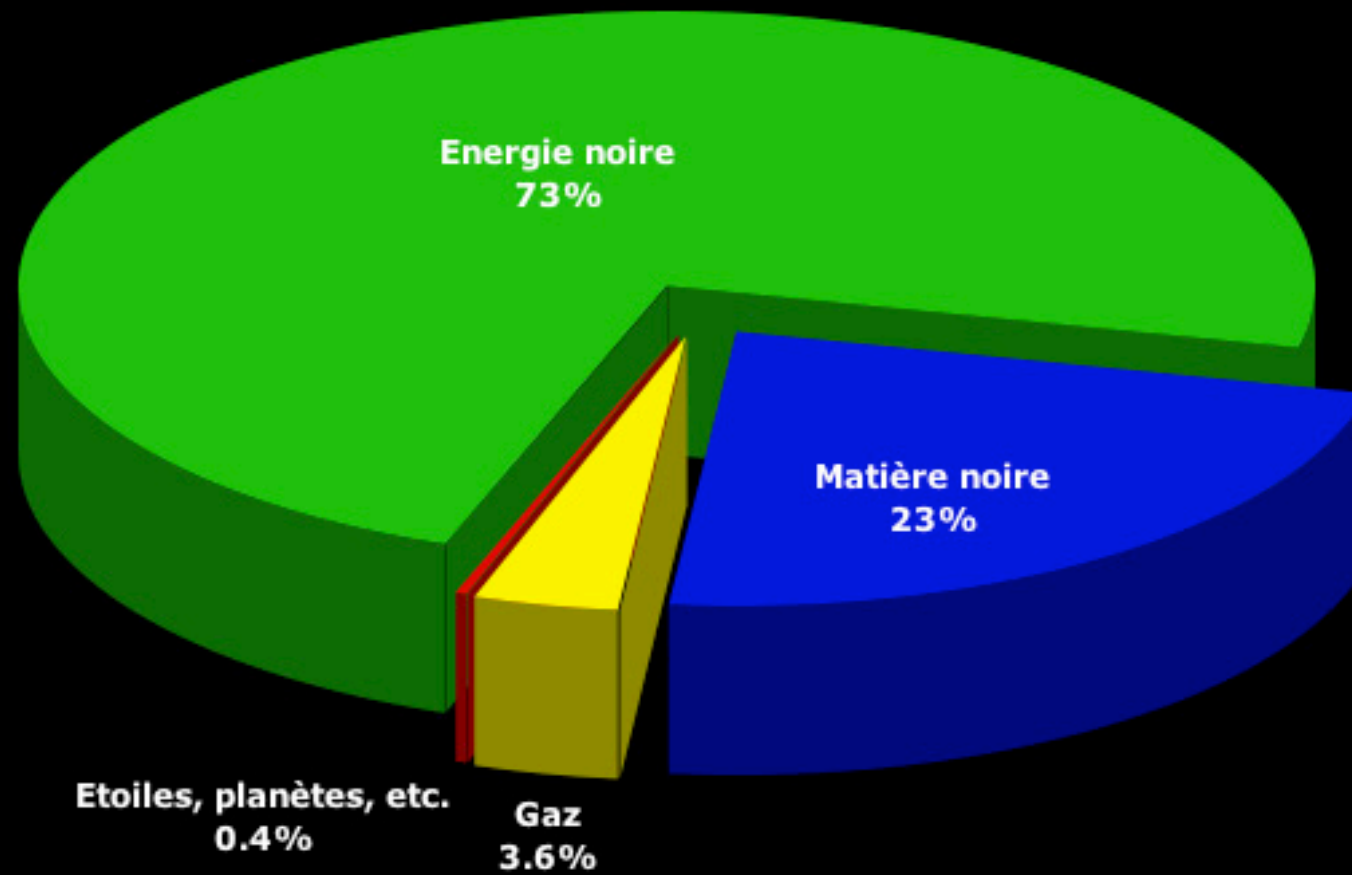






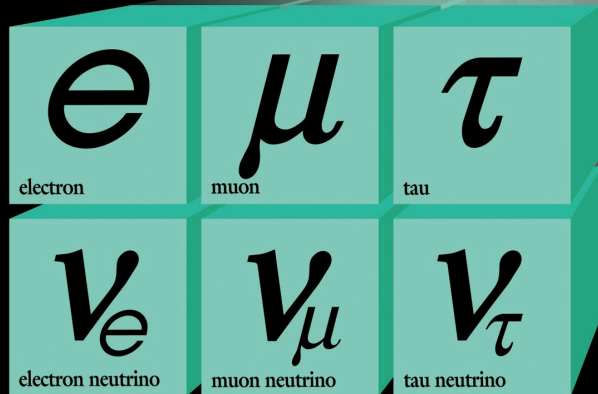
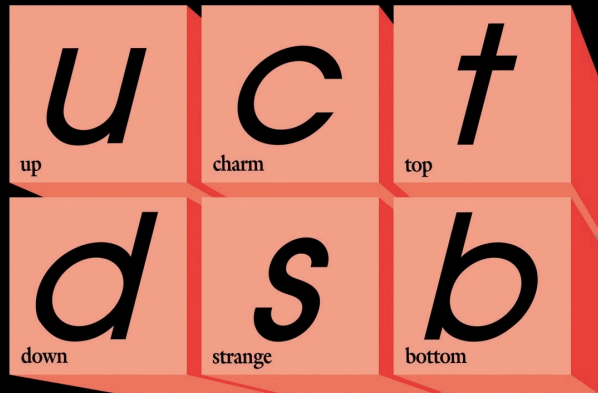


## L'univers selon nos observations



Fermions: spin = 1/2 particles

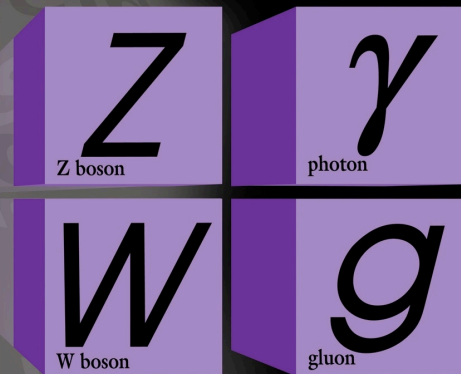
## Quarks



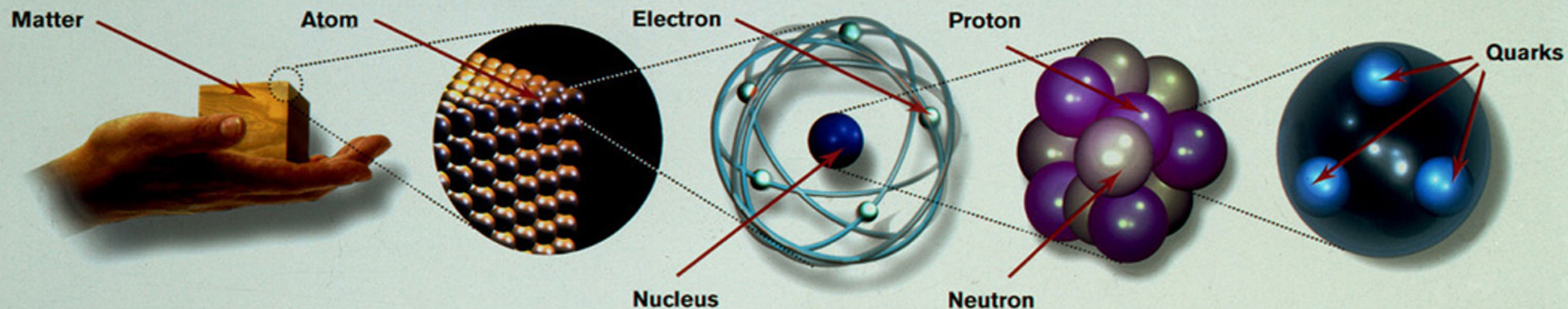
## Leptons

Vector Bosons: spin = 1 particles

## Forces



Higgs Boson:  
spin = 0  
fundamental  
scalar particle



### Matter particles

All ordinary particles belong to this group

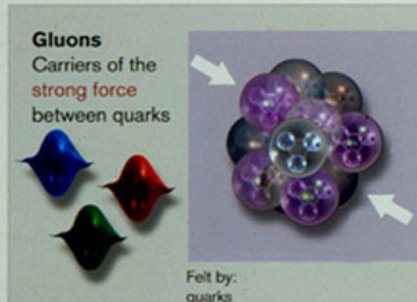
These particles existed just after the Big Bang. Now they are found only in cosmic rays and accelerators

LEPTONS		
FIRST FAMILY	<b>Electron</b> Responsible for electricity and chemical reactions; it has a charge of -1	<b>Electron neutrino</b> Particle with no electric charge, and possibly no mass; billions fly through your body every second
SECOND FAMILY	<b>Muon</b> A heavier relative of the electron; it lives for two-millionths of a second	<b>Muon neutrino</b> Created along with muons when some particles decay
THIRD FAMILY	<b>Tau</b> Heavier still; it is extremely unstable. It was discovered in 1975	<b>Tau neutrino</b> not yet discovered but believed to exist

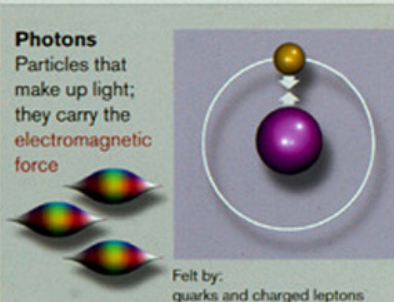
QUARKS	
<b>Up</b> Has an electric charge of plus two-thirds; protons contain two, neutrons contain one	<b>Down</b> Has an electric charge of minus one-third; protons contain one, neutrons contain two
<b>Charm</b> A heavier relative of the up; found in 1974	<b>Strange</b> A heavier relative of the down; found in 1964
<b>Top</b> Heavier still	<b>Bottom</b> Heavier still; measuring bottom quarks is an important test of electroweak theory

### Force particles

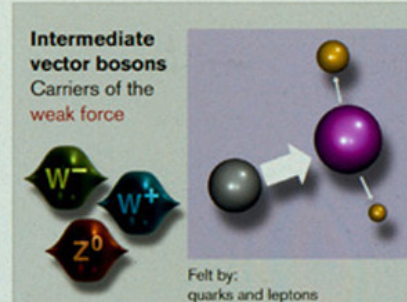
These particles transmit the four fundamental forces of nature, although gravitons have so far not been discovered



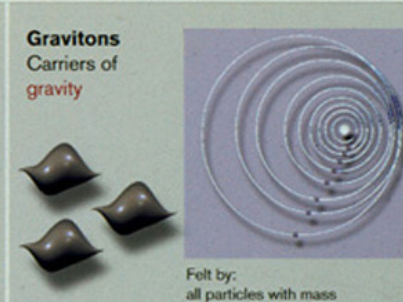
The explosive release of nuclear energy is the result of the **strong force**



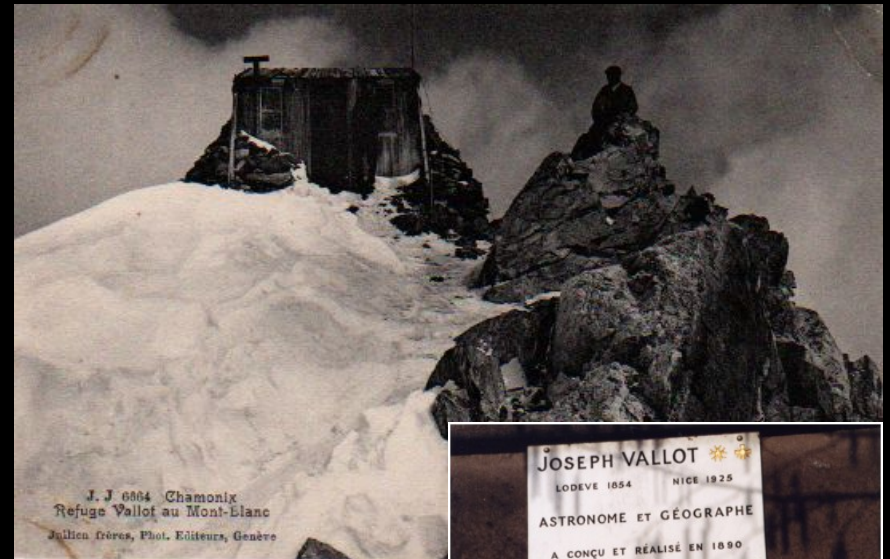
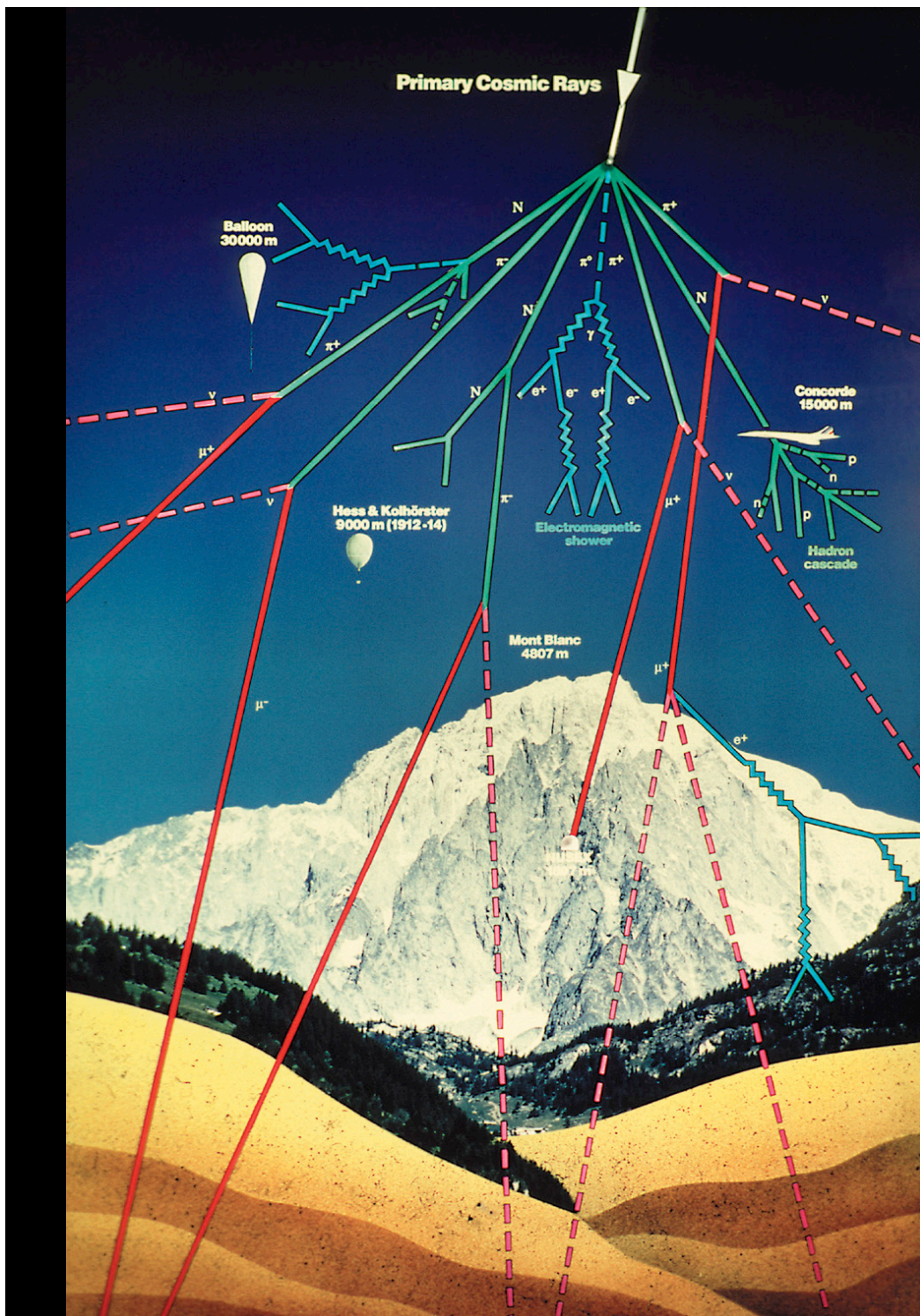
Electricity, magnetism and chemistry are all the results of **electro-magnetic force**



Some forms of radio-activity are the result of the **weak force**



All the weight we experience is the result of the **gravitational force**

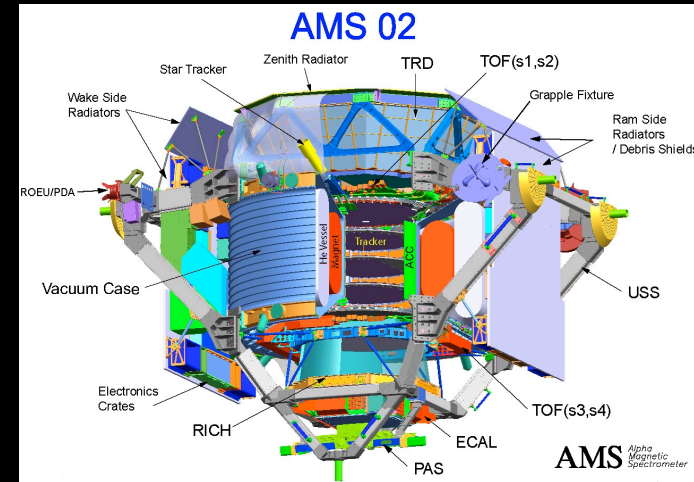
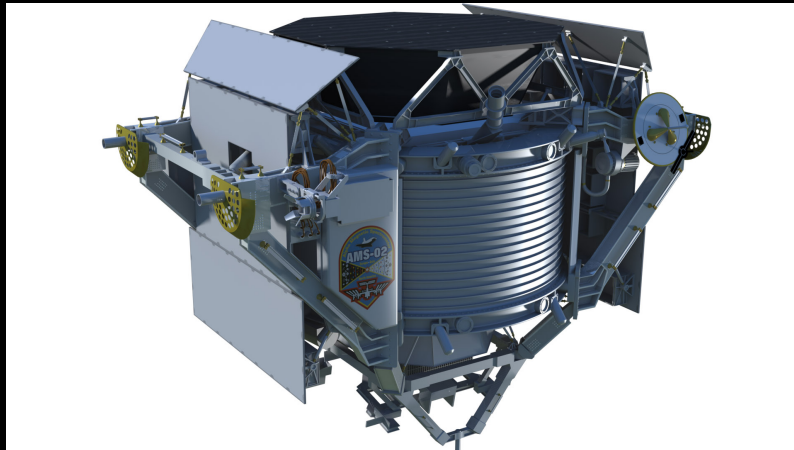


ANTIMATTER'S  
GONE MISSING...

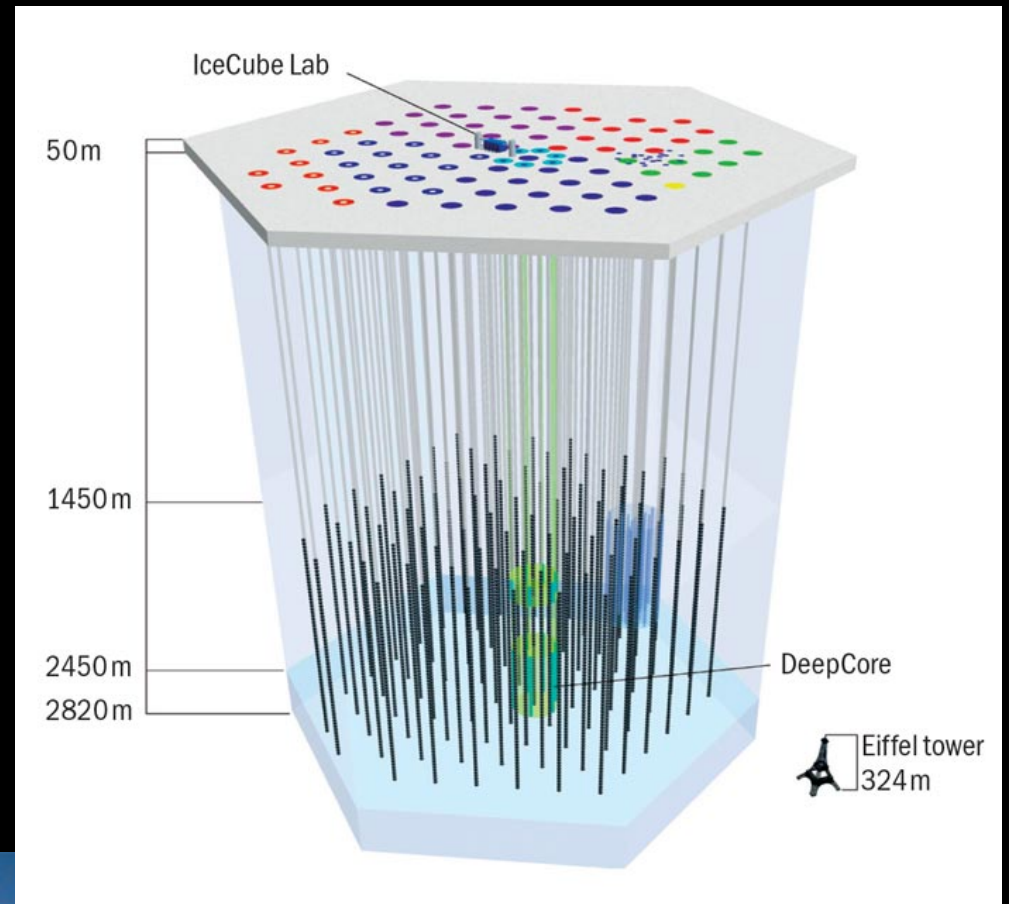
WHEN DID THIS  
HAPPEN, SIR?

ABOUT 15  
BILLION YEARS  
AGO...

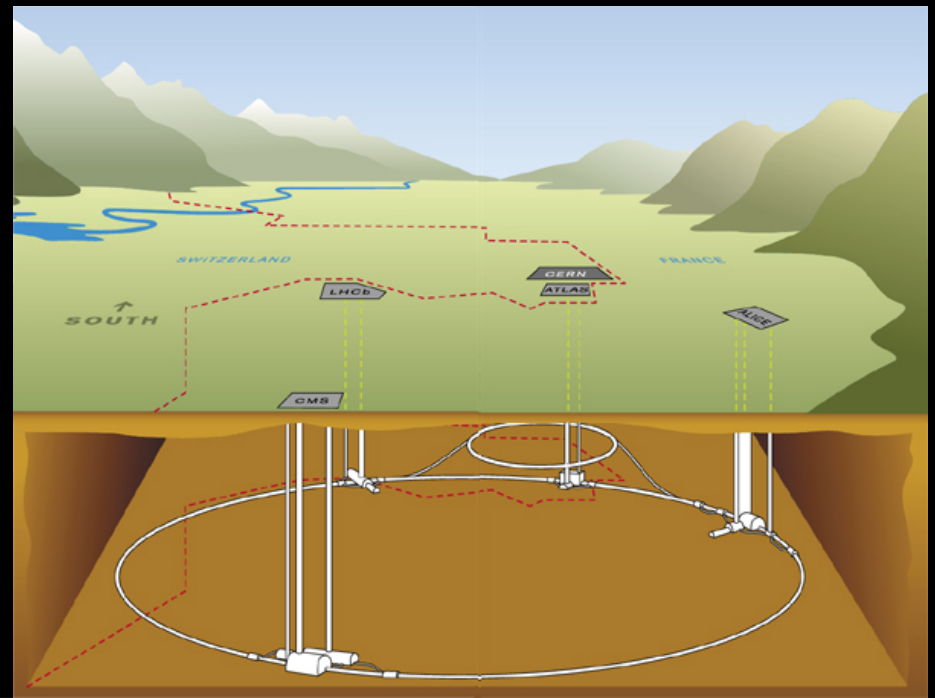




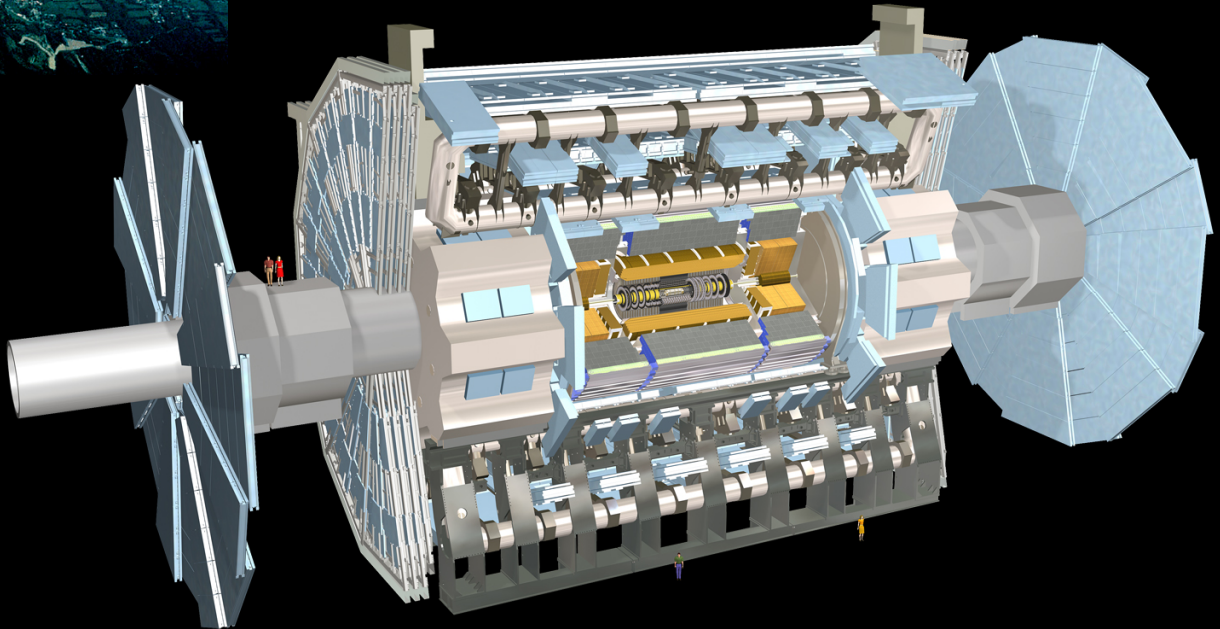
**AMS  
on  
ISS**

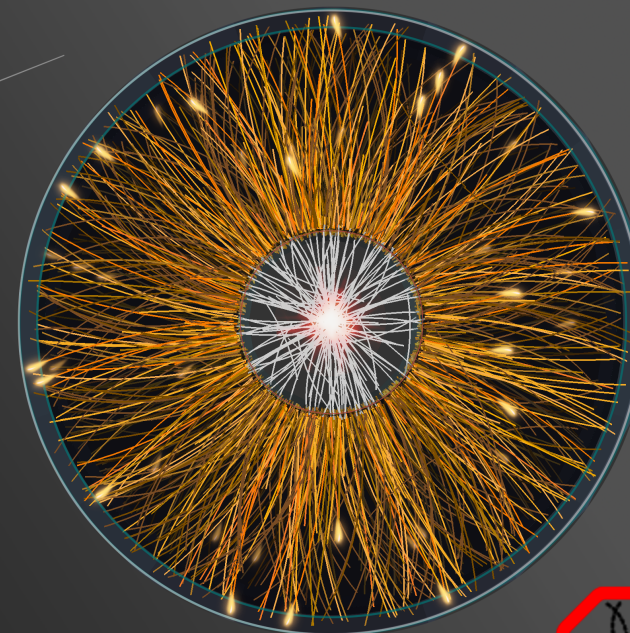
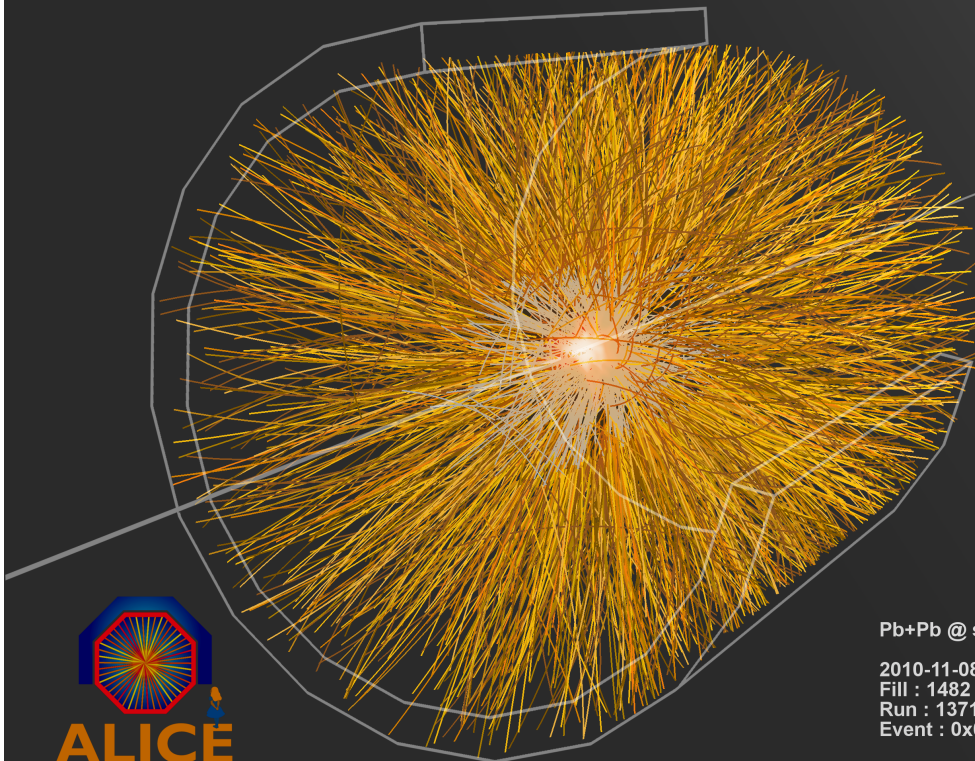


**IceCube  
at  
South pole**



**LHC**





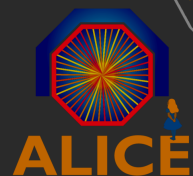
Pb+Pb @  $\sqrt{s} = 2.76$  ATeV

2010-11-08 11:29:42

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Run : 137124

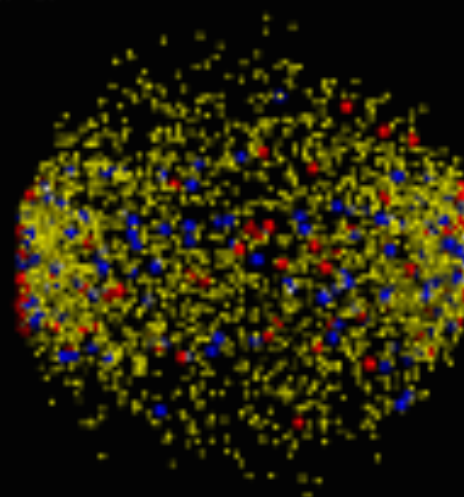
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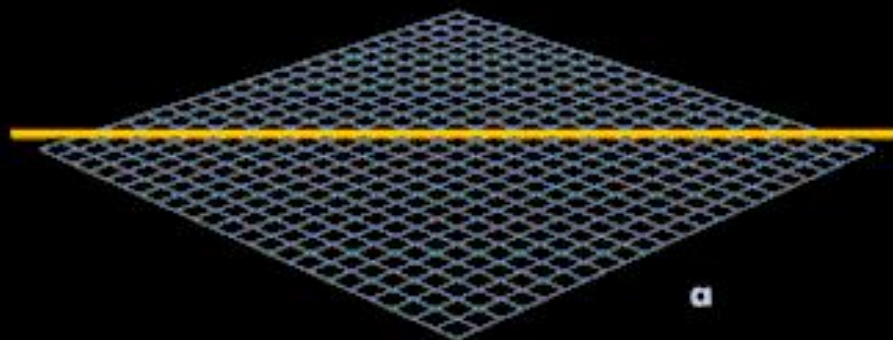
NIKOS EMMANOULIDIS  
AGEIKI MANTA  
contactniko@yahoo.de  
ageiki13@gmail.com

ALICE  $\sqrt{s_{NN}} = 2.76$  ATeV

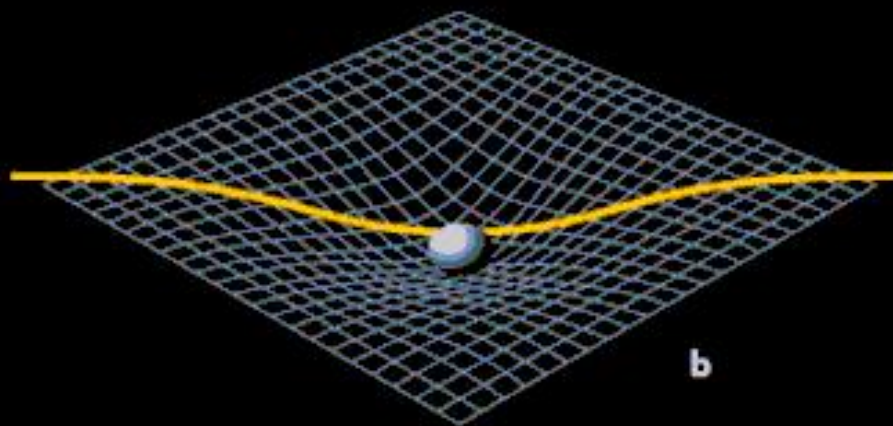
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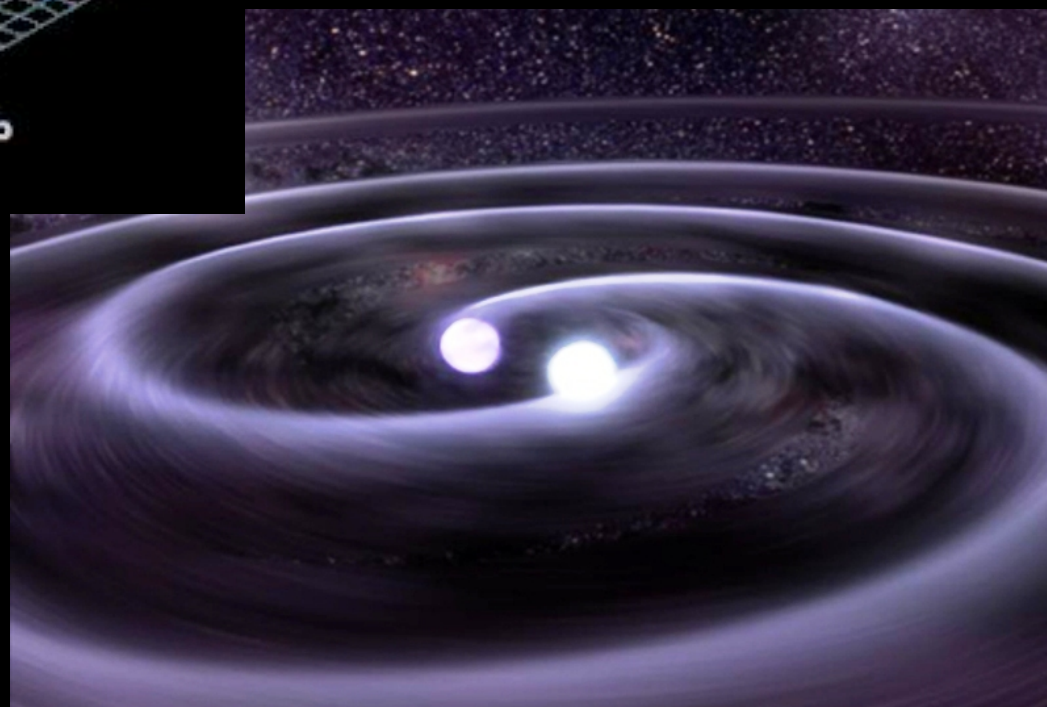
HLT ALICE



a



b





**Virgo**

**Lisa**

