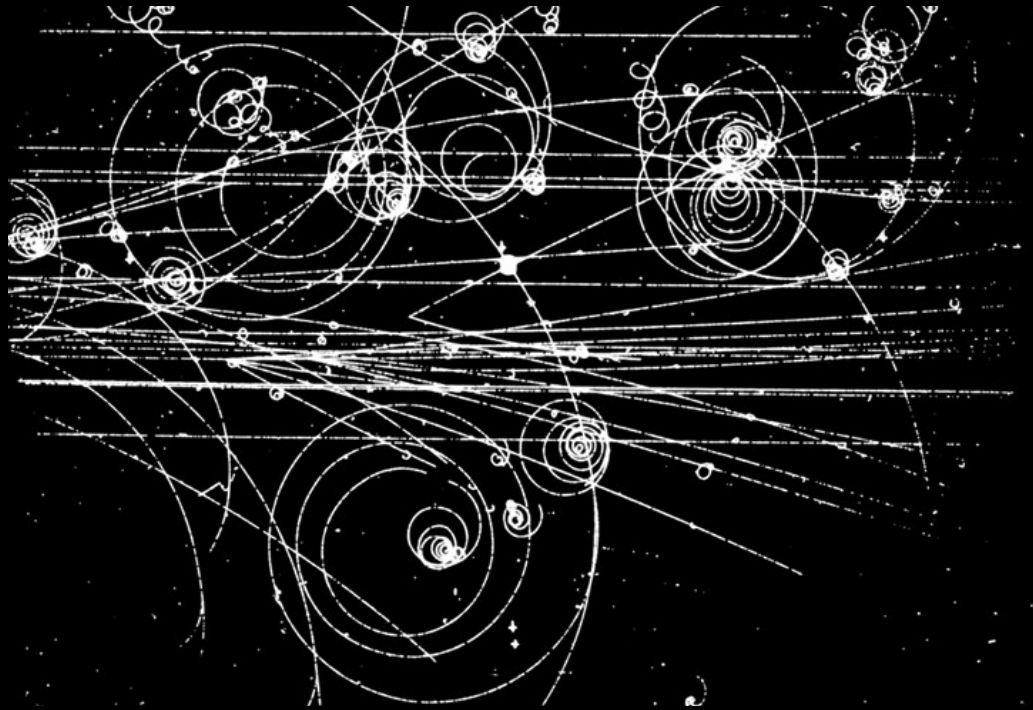
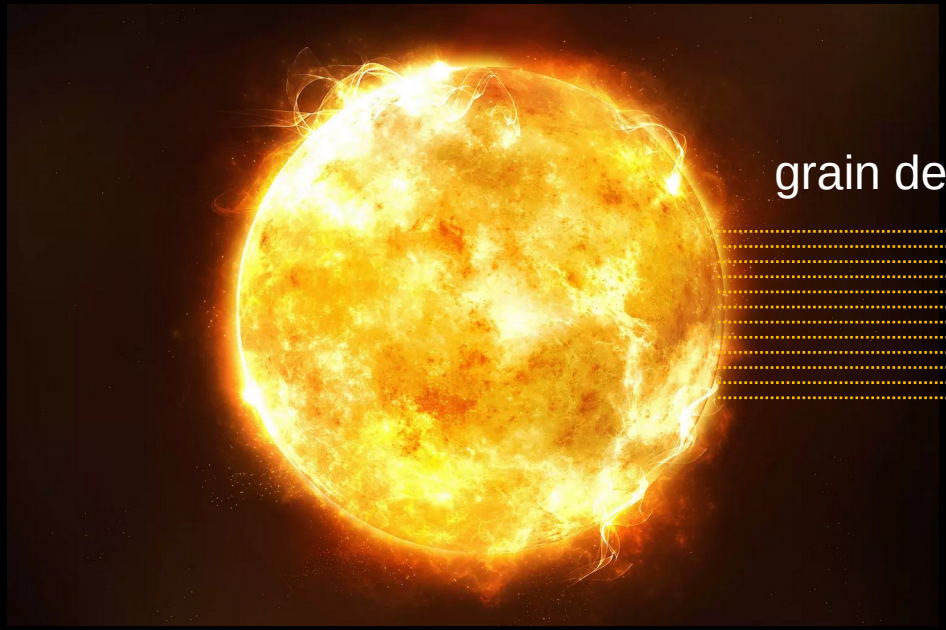
Invisible mais pas indétectable, sur la trace des particules



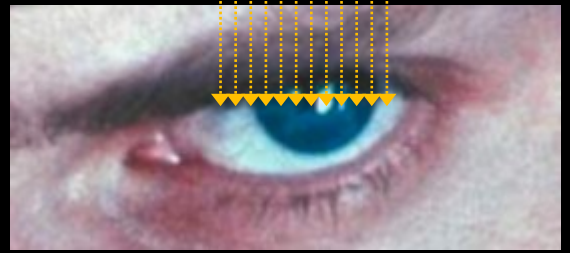
1/ Visible
1/ Détectable
3/ Traces
4/ Higgs

visible → œil
→ détecteur

visible → principe (1)



grain de lumière = photon

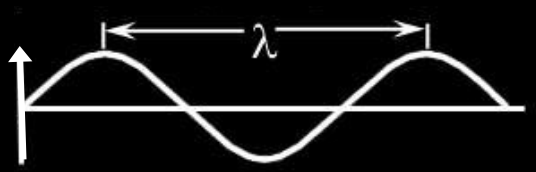


visible → principe (2)

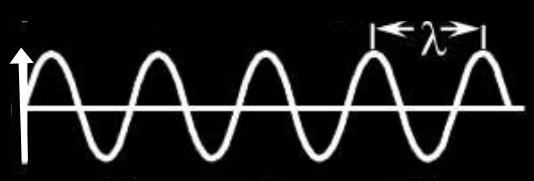
~5 cm de diamètre

~0.05 mm de diamètre
100 fois plus petit

visible → principe (3)

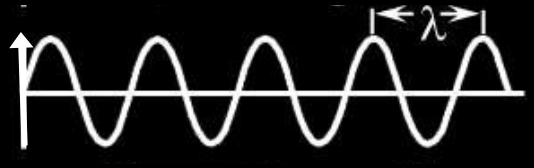


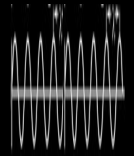
longueur d'onde équivalente



visible → principe (4)

grain de lumière = photon





sonde:
- balle de tennis
- grain de sable

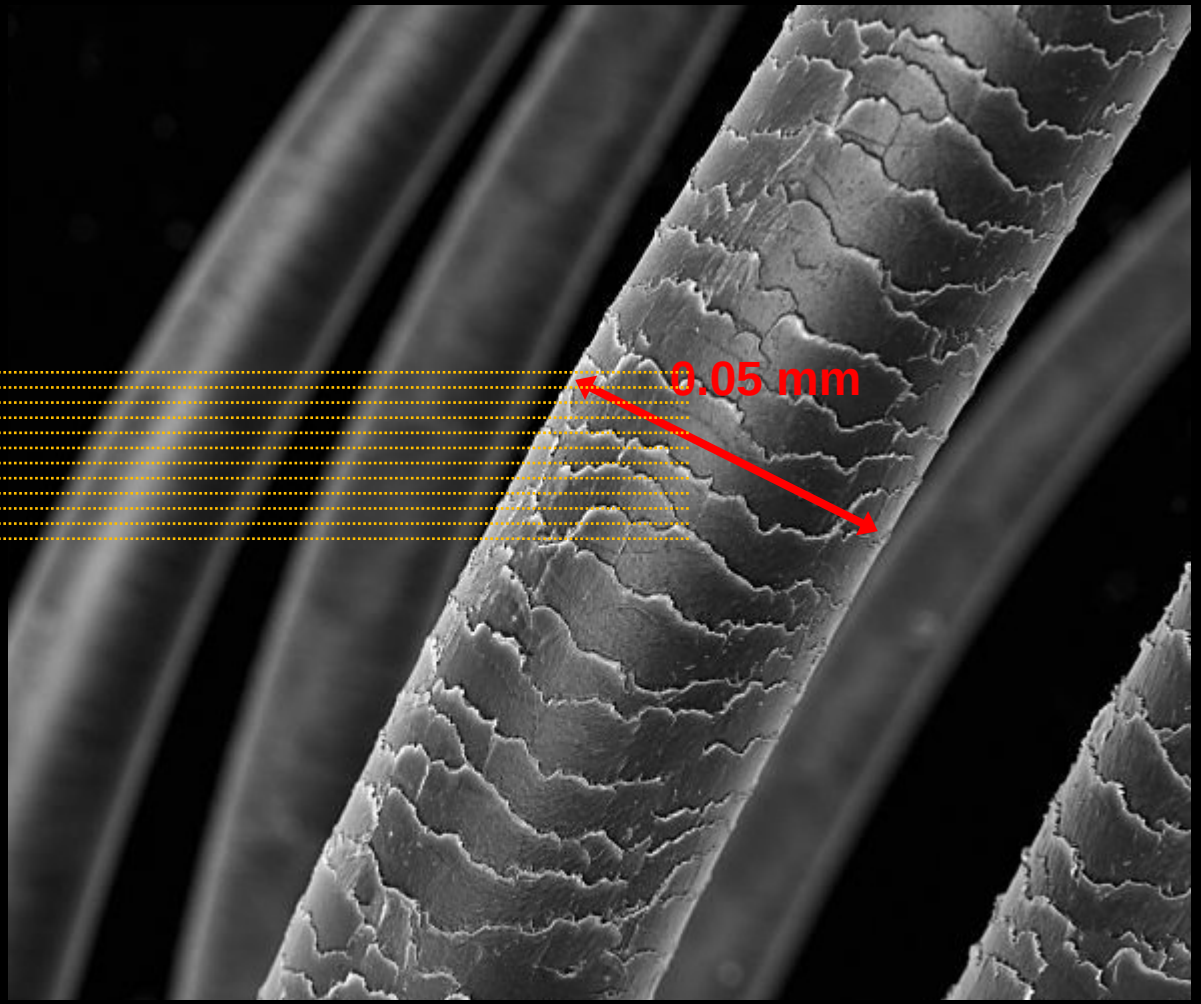
longueur d'onde équivalente

sonde :
- grain de lumière = photon

→ visible ~ 0.0005 mm = 5.10^{-7} m

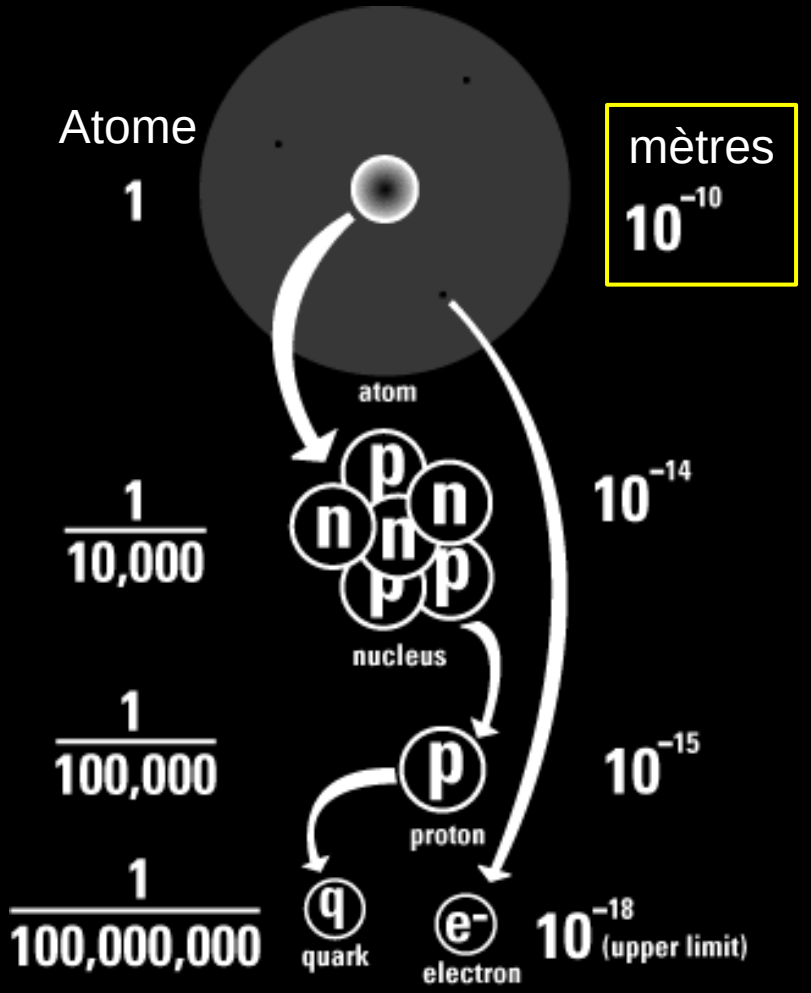
visible → œil

→ cheveux ~0.05 mm de diamètre soit $5.\ 10^{-5}$ mètres



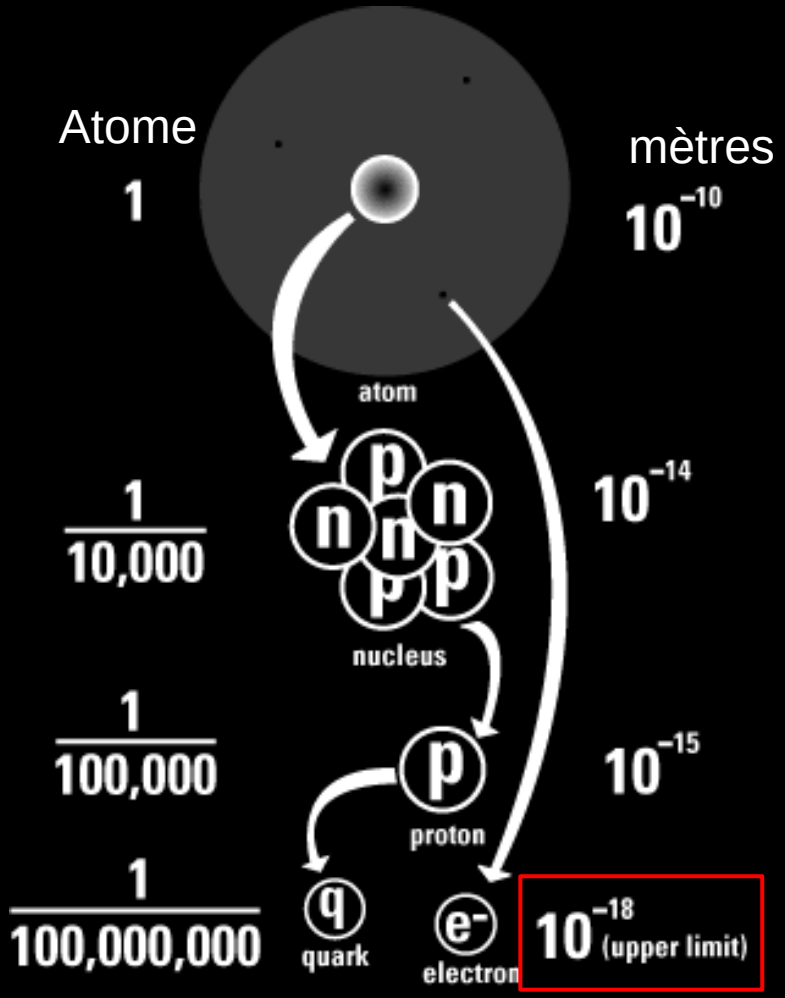
visible → œil ↔ photo
→ ~10^{-5} mètres

visible → œil ↔ photo
→ ~10^{-5} mètres

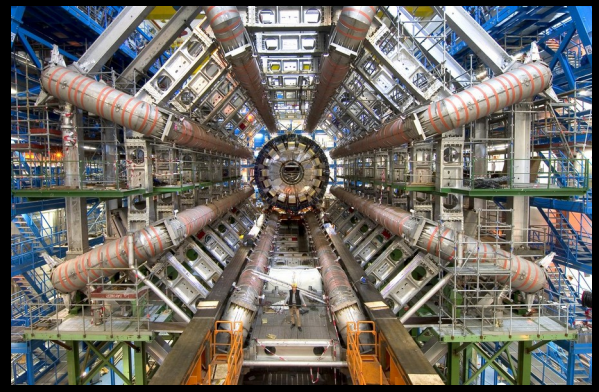


visible → œil ↔ photo
→ ~10^{-5} mètres

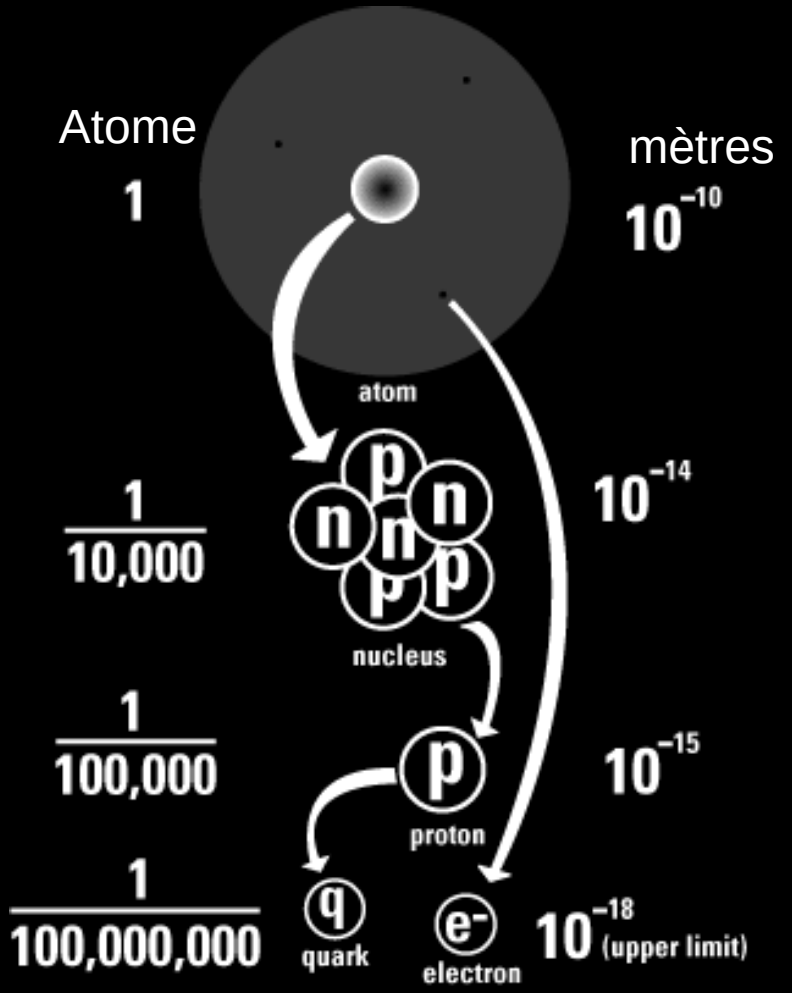
changement de techniques d'outils



visible → œil ↔ photo
→ ~10^{-5} mètres



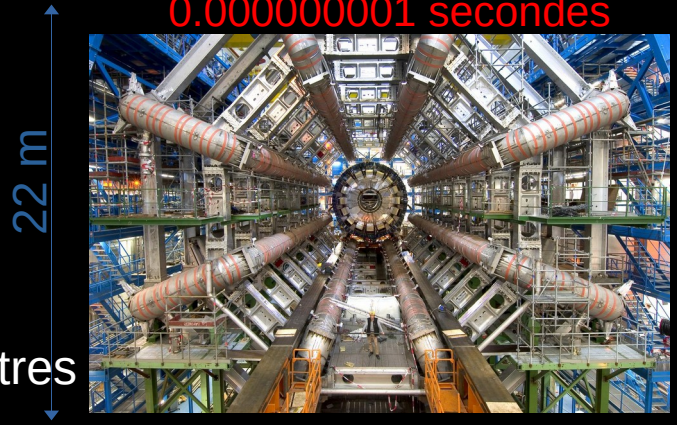
détection → ATLAS
→ ~10^{-18} mètres



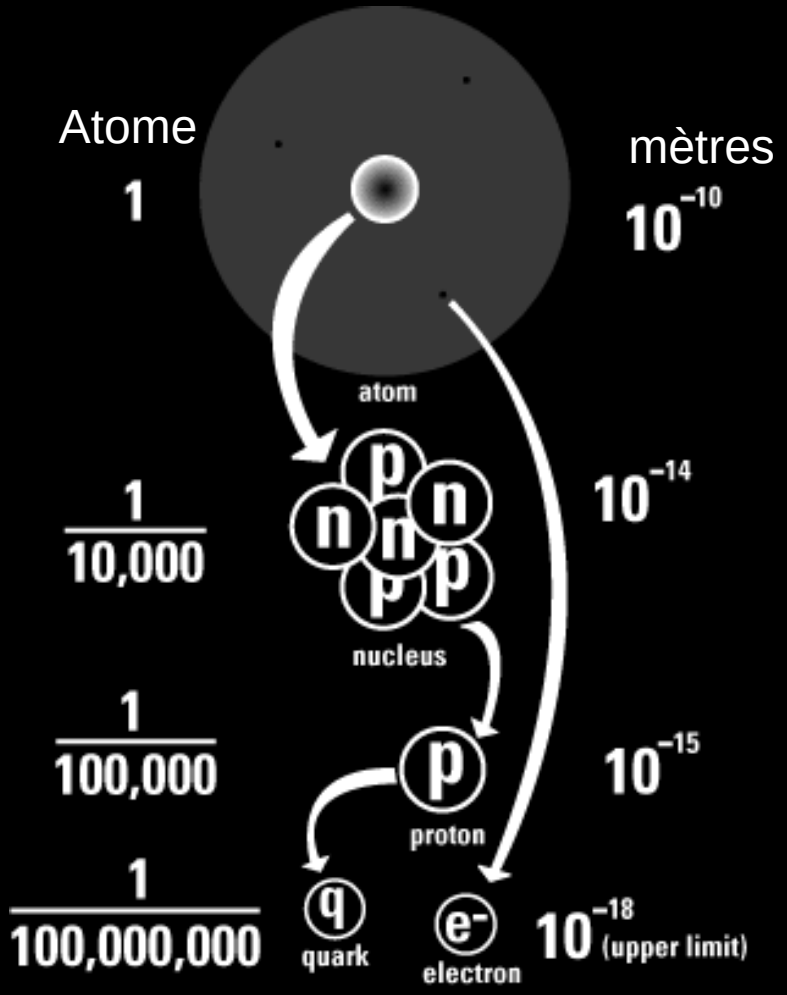
visible → œil ↔ photo
→ ~10^{-5} mètres

100 000 000 pixels
0.1 secondes

100 000 000 pixels
0.000000001 secondes



détection → ATLAS
→ ~10^{-18} mètres



détection :

- données ↔ mesures
  - œil
  - sable
  - plaque photo
  - courant
  - tension
- logique
  - cause → effet
- reconstruction
  - association mesures
  - erreurs de mesures

détection :

liquide + particules

→

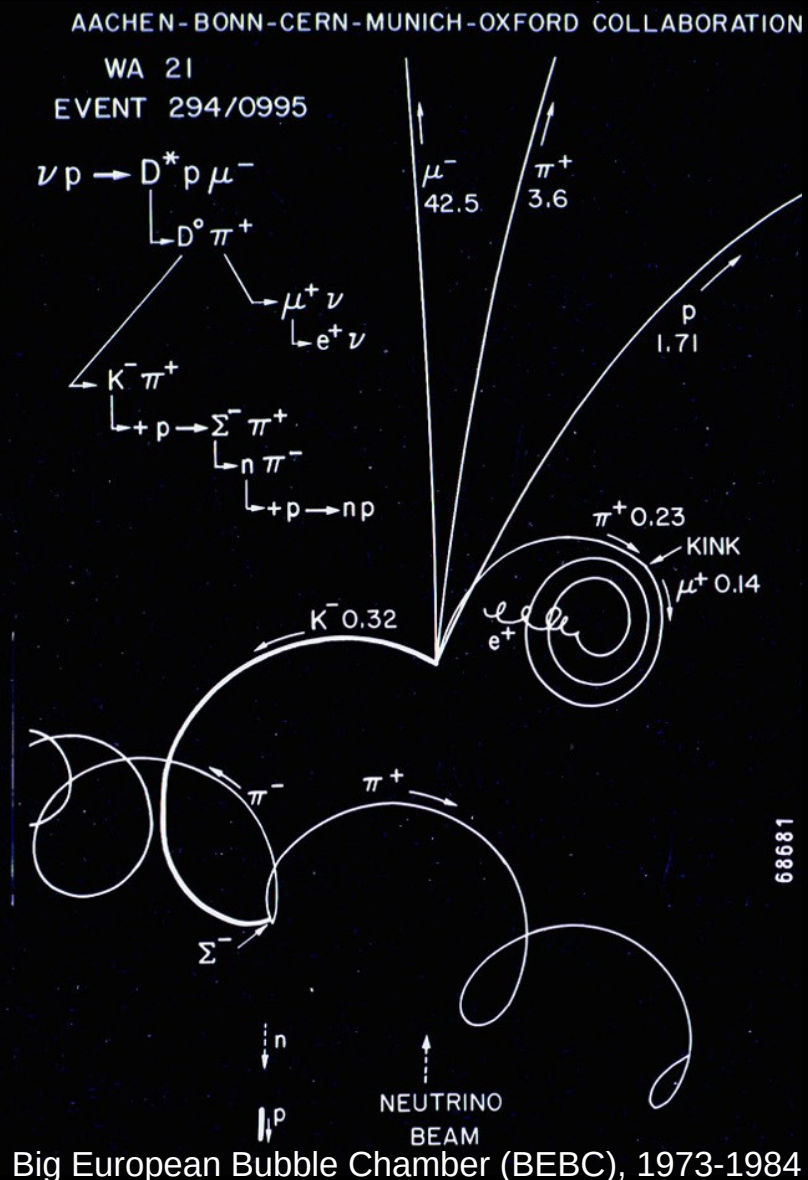
vaporisation locale

+

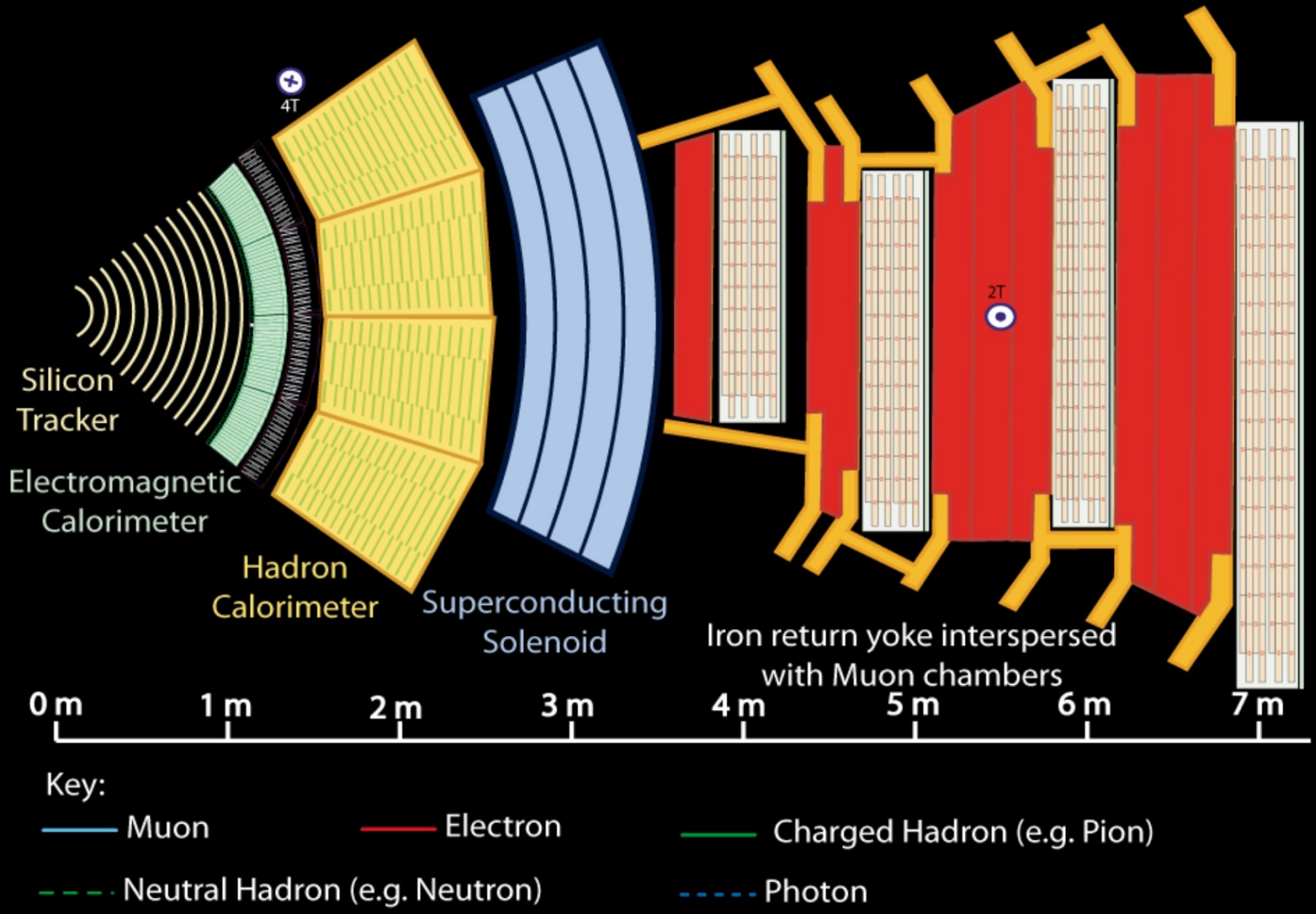
lumière rasante

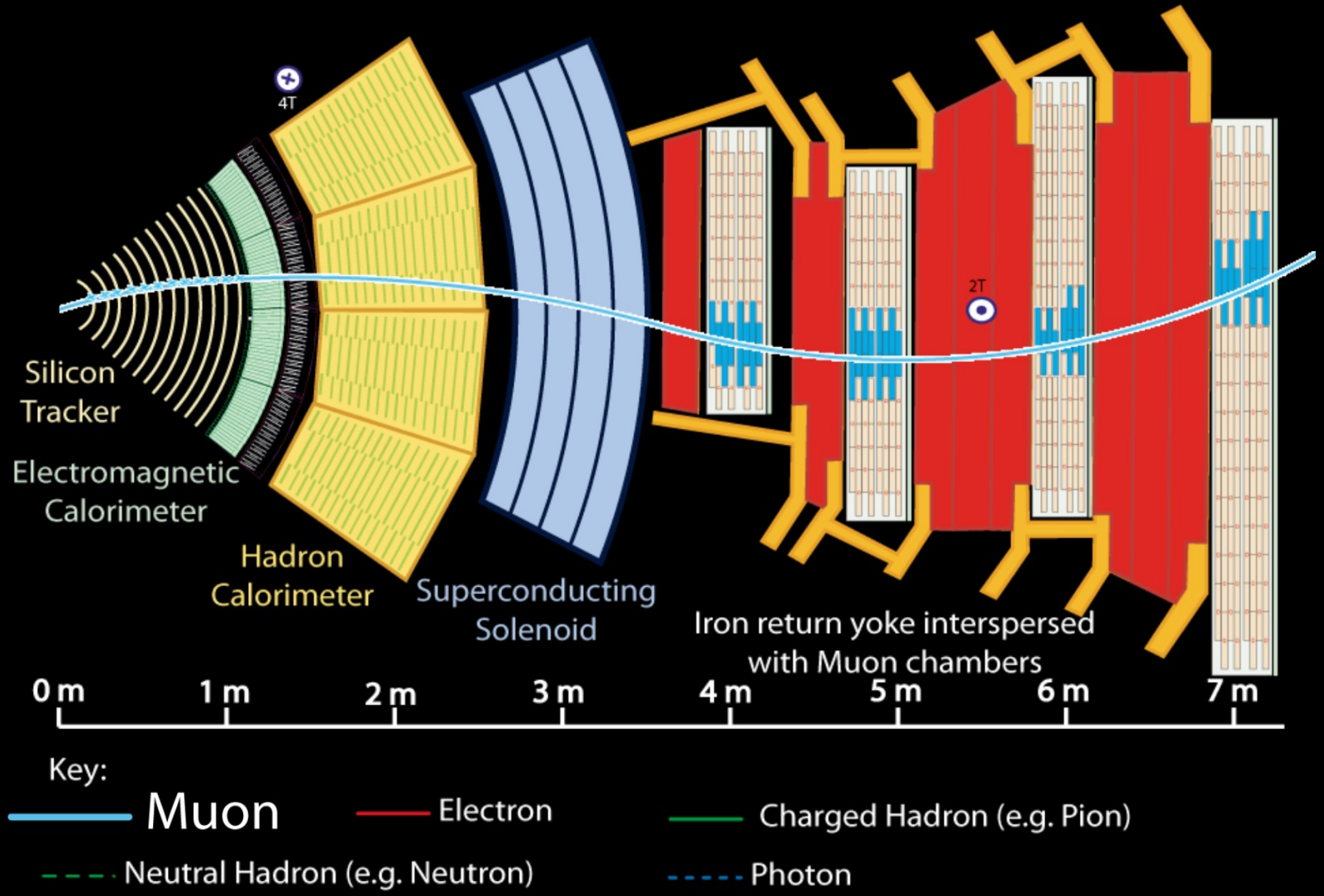
→

traces visible !



Big European Bubble Chamber (BEBC), 1973-1984


4T
2T
Silicon Tracker
Electromagnetic Calorimeter
Hadron Calorimeter
Superconducting Solenoid
Iron return yoke interspersed with Muon chambers
0 m
1 m
2 m
3 m
4 m
5 m
6 m
7 m
Key:
Muon
Electron
Charged Hadron (e.g. Pion)
Neutral Hadron (e.g. Neutron)
Photon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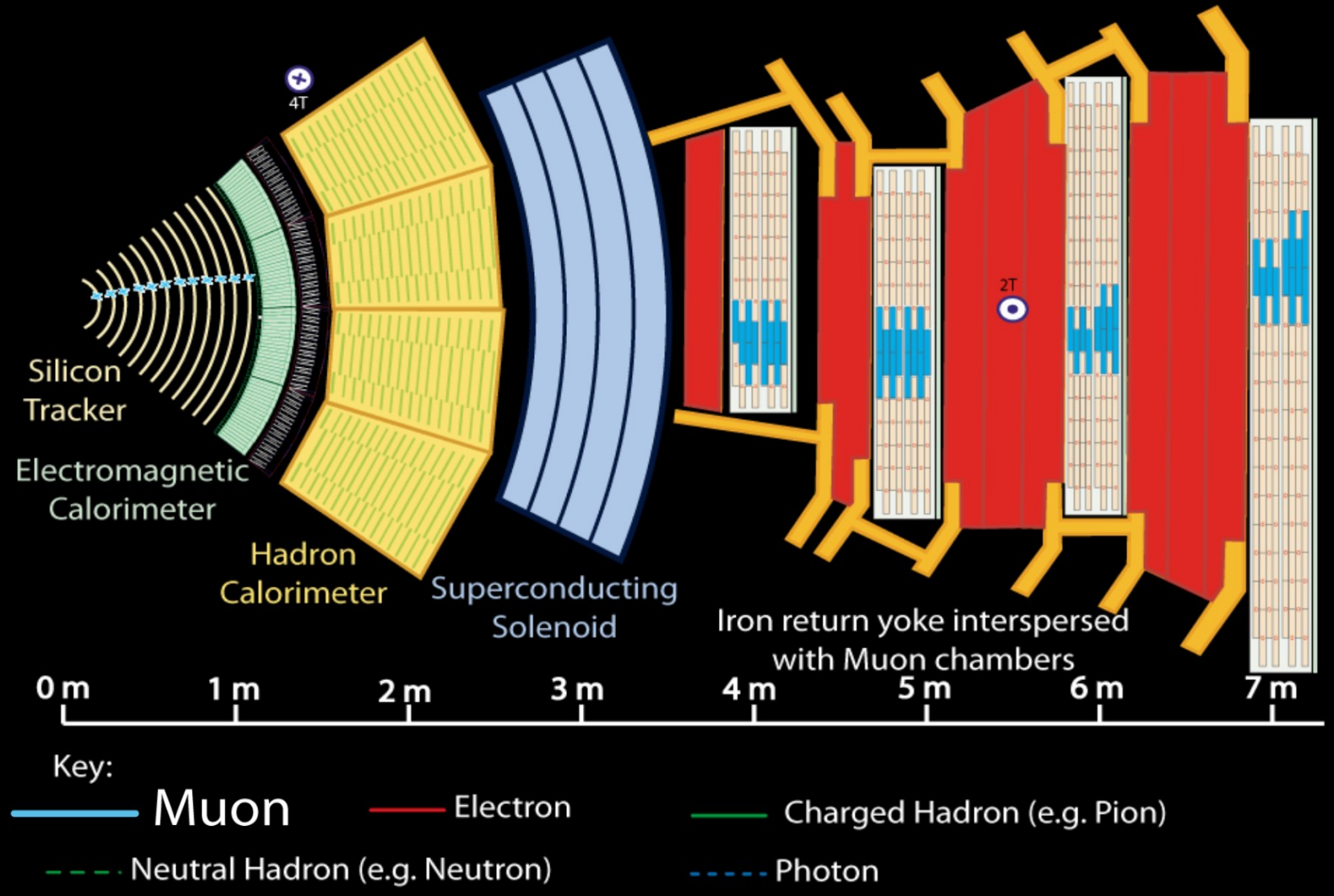
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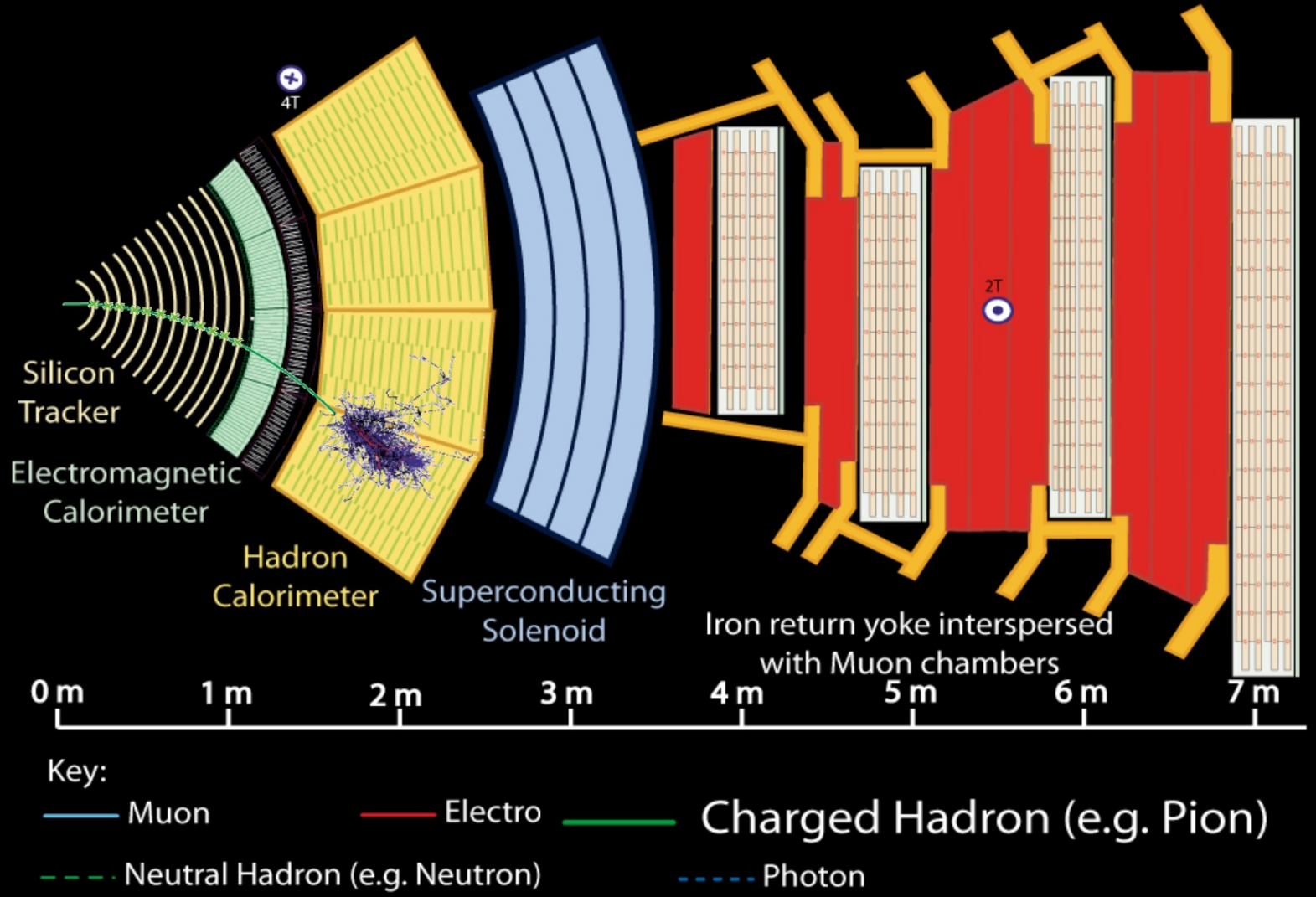
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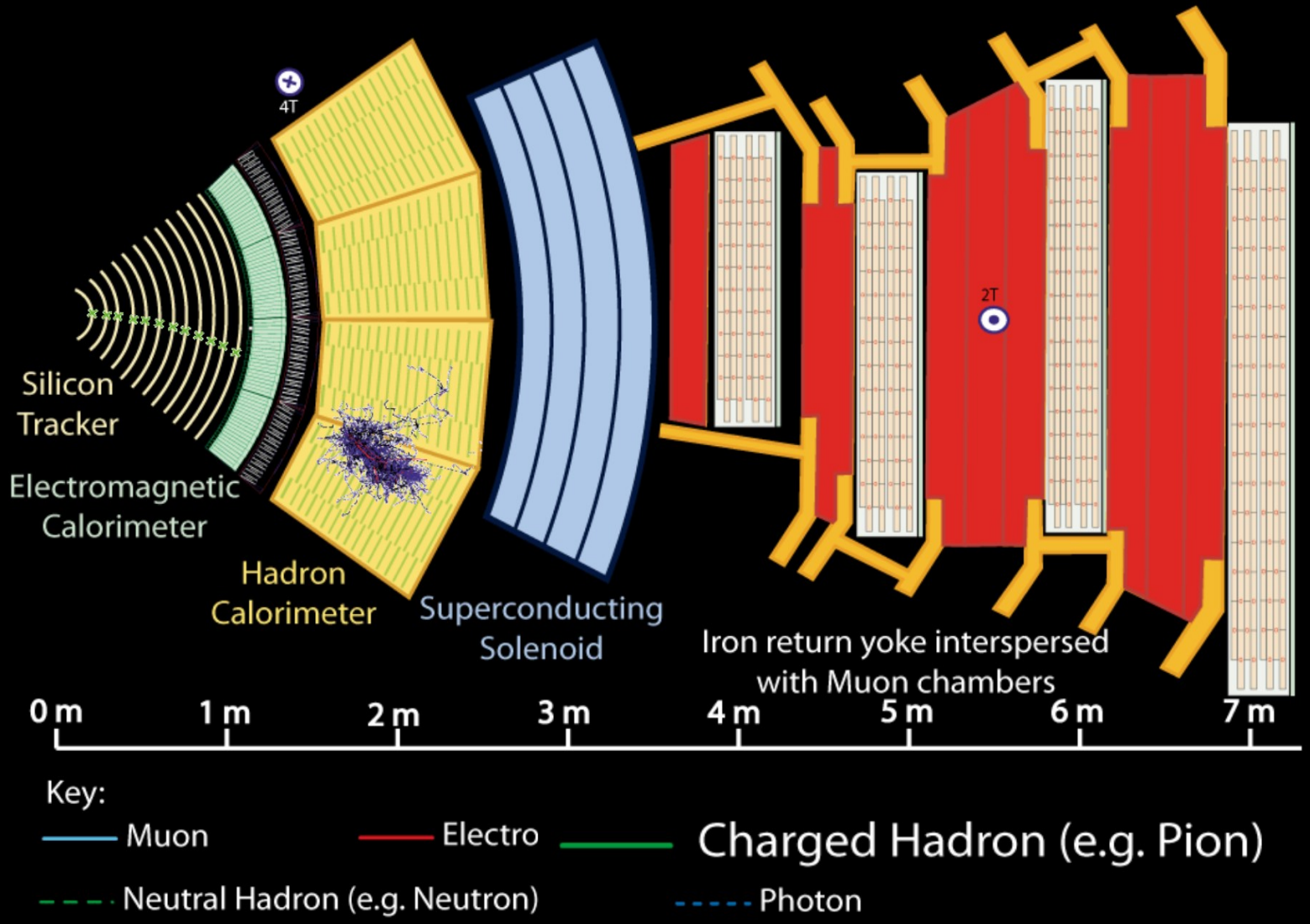
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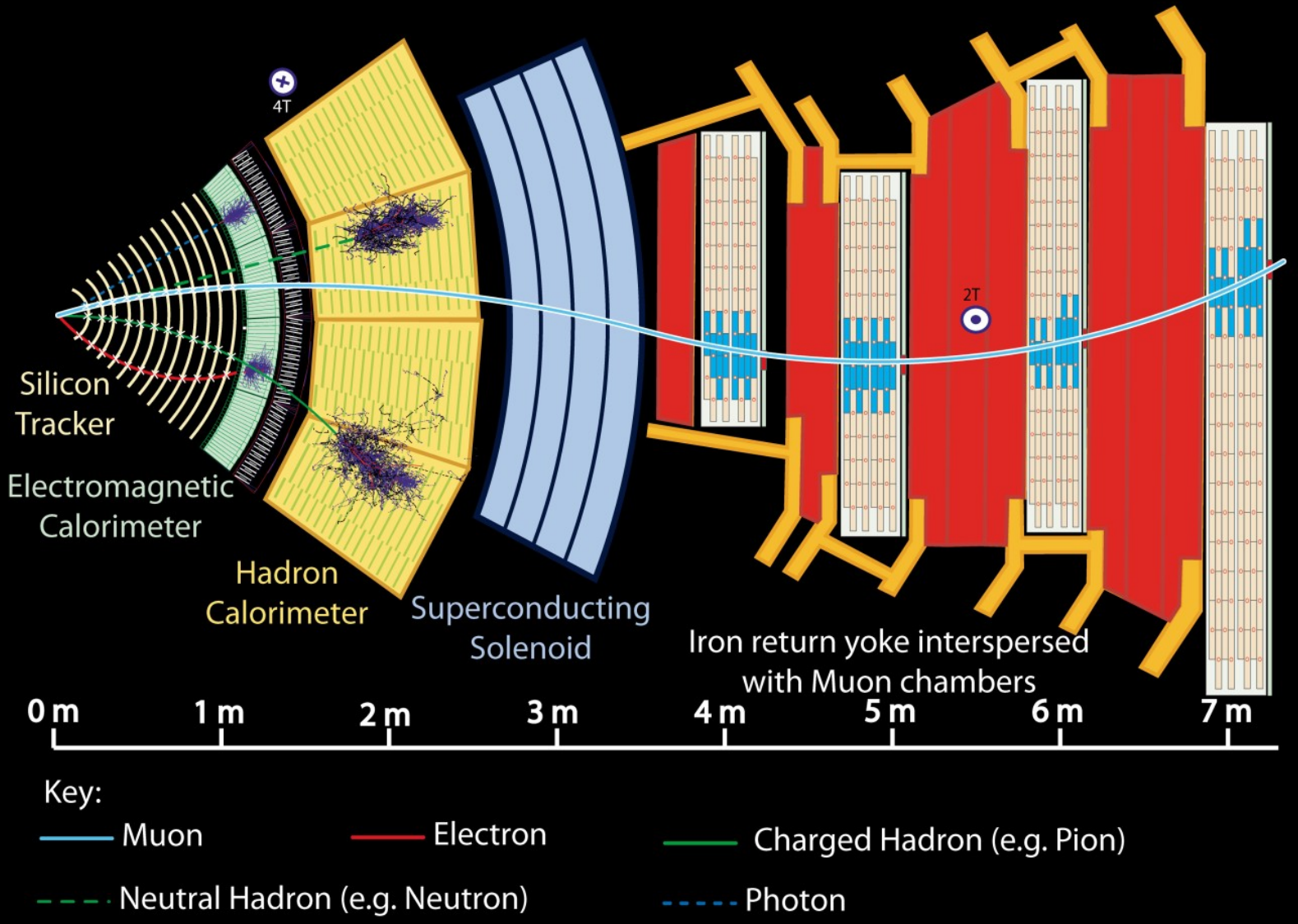
4T
2T
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Iron return yoke interspersed with Muon chambers
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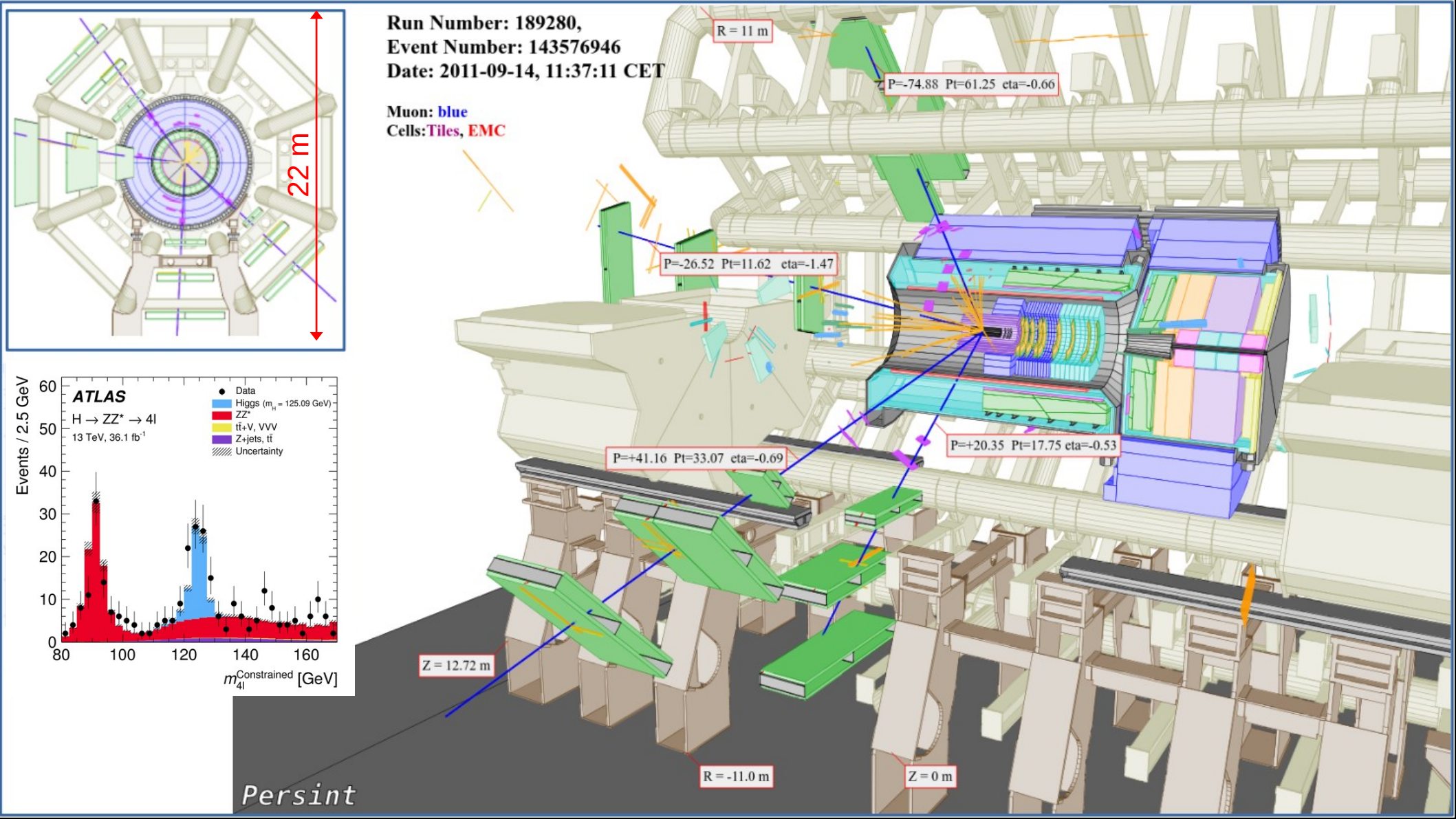
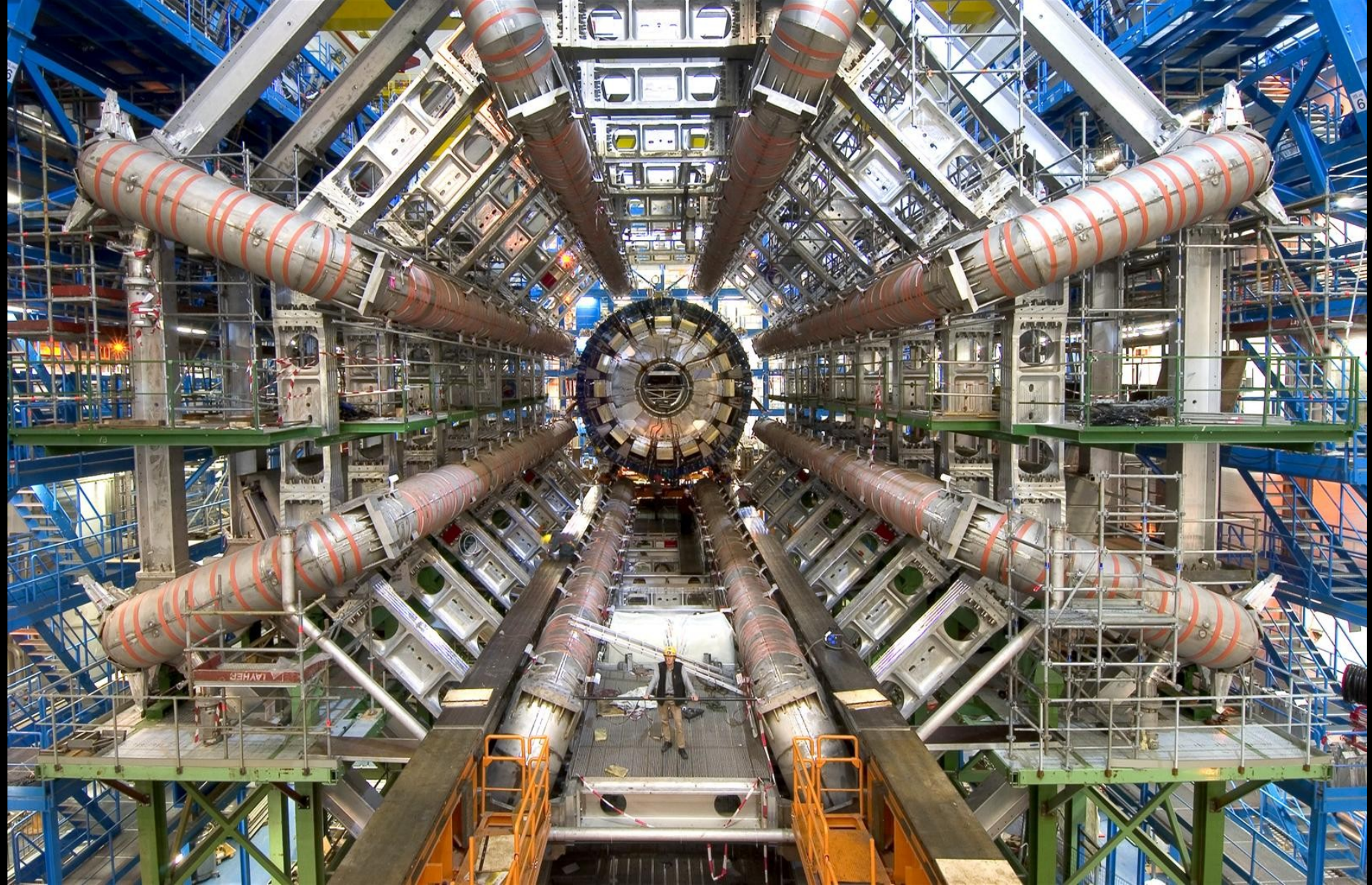
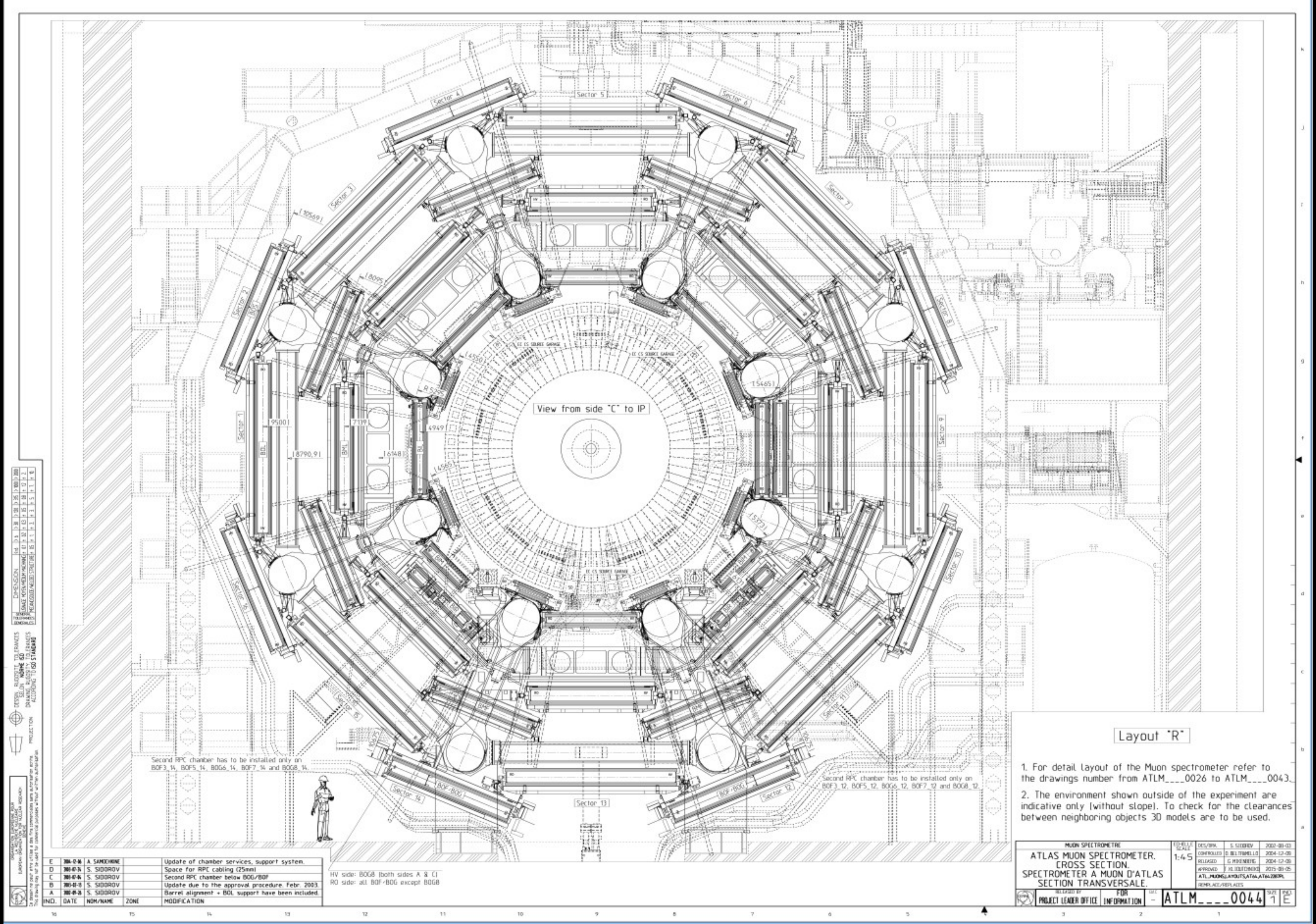
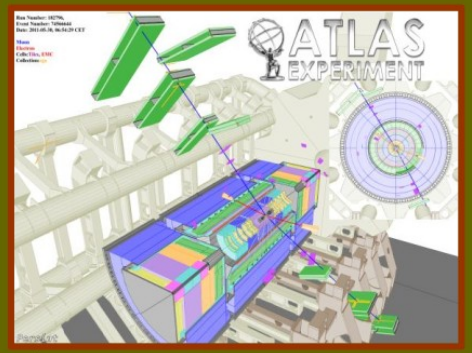
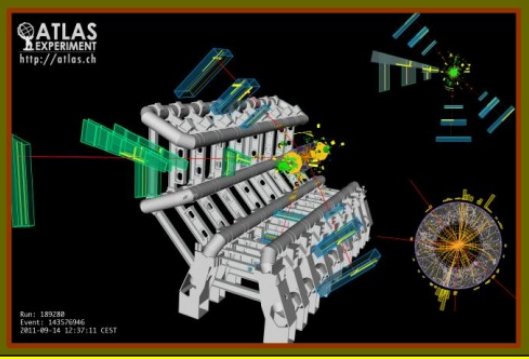

Run Number: 189280,
Event Number: 143576946
Date: 2011-09-14, 11:37:11 CET
Muon: blue
Cells:Tiles, EMC
22 m
R = 11 m
P=-74.88 Pt=61.25 eta=-0.66
P=-26.52 Pt=11.62 eta=-1.47
P=+41.16 Pt=33.07 eta=-0.69
P=+20.35 Pt=17.75 eta=-0.53
Z = 12.72 m
R = -11.0 m
Z = 0 m
Persint
ATLAS
H → ZZ* → 4l
13 TeV, 36.1 fb-1
Data
Higgs (mH = 125.09 GeV)
ZZ*
tt̄+V, VVV
Z+jets, tt̄
Uncertainty
Events / 2.5 GeV
m4lConstrained [GeV]

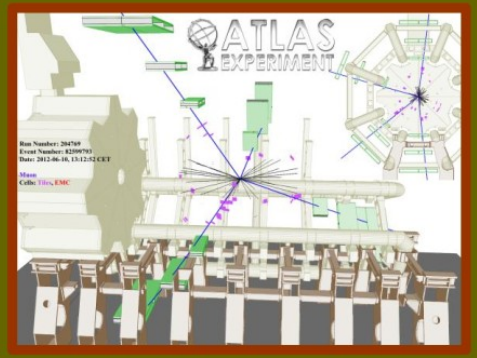

cité
sciences et industrie
conférences
Raconte-moi le CERN
70 ans d'exploration de l'infiniment petit
28—29 septembre 2024
de 10h à 19h
RÉPUBLIQUE FRANÇAISE
M> Porte de la Villette
cite-sciences.fr
#Conférences
En partenariat avec
CERN
70 ANS
cea
cnrs



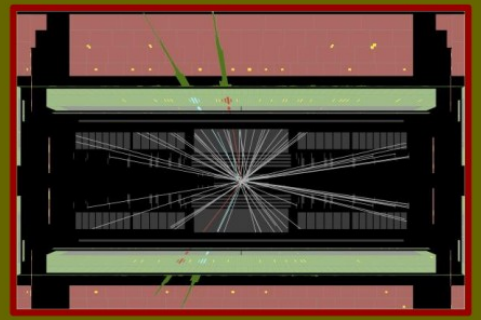

View from side "C" to IP
Sector 1
Sector 2
Sector 3
Sector 4
Sector 5
Sector 6
Sector 7
Sector 8
Sector 9
Sector 10
Sector 12
Sector 13
Sector 14
Sector 16
BOL
BML
BIL
9500
7139
18790,91
16148
4949
10569
8095
EC CS SOURCE GARAGE
Second RPC chamber has to be installed only on BOF3_14, BOF5_14, BOG6_14, BOF7_14 and BOG8_14.
Second RPC chamber has to be installed only on BOF3_12, BOF5_12, BOG6_12, BOF7_12 and BOG8_12.
HV side: BOG8 (both sides A & C)
RO side: all BOF-BOG except BOG8
Layout "R"
1. For detail layout of the Muon spectrometer refer to the drawings number from ATLM____0026 to ATLM____0043.
2. The environment shown outside of the experiment are indicative only (without slope). To check for the clearances between neighboring objects 3D models are to be used.
E | A. SAMOCHKINE | Update of chamber services, support system.
D | S. SIDOROV | Space for RPC cabling (25mm)
C | S. SIDOROV | Second RPC chamber below BOG/BOF
B | S. SIDOROV | Update due to the approval procedure. Febr. 2003.
A | S. SIDOROV | Barrel alignment + BOL support have been included.
IND. | DATE | NOM/NAME | ZONE | MODIFICATION
MUON SPECTROMETRE
ATLAS MUON SPECTROMETER. CROSS SECTION.
SPECTROMETRE A MUON D'ATLAS SECTION TRANSVERSALE.
1:45
PROJECT LEADER OFFICE
FOR INFORMATION
ATLM____0044





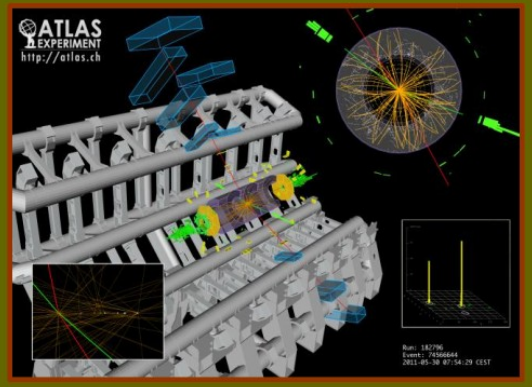


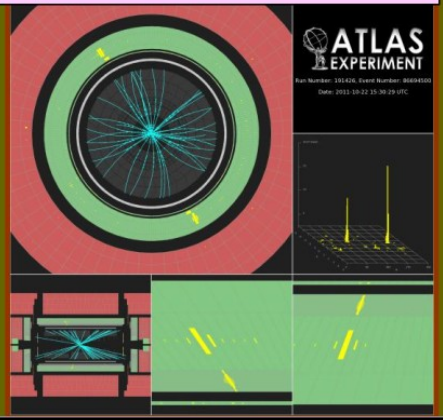
Status of Standard Model Higgs searches in ATLAS

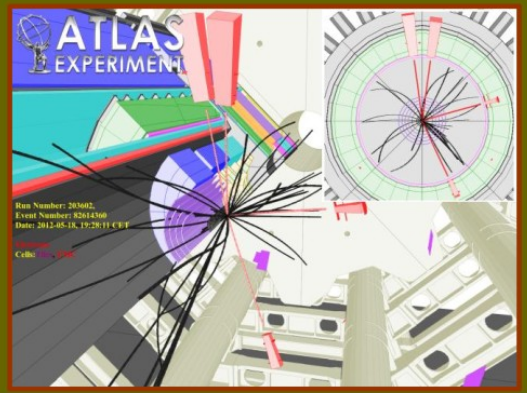


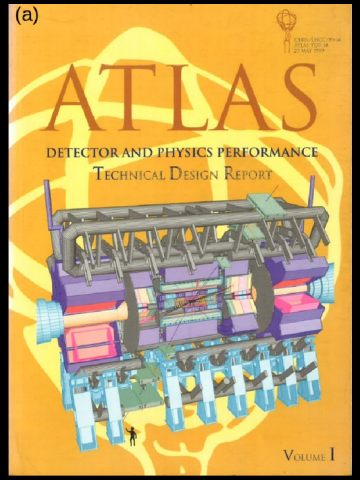
Using the full datasets recorded in 2011 at $\sqrt{s}$= 7 TeV and 2012 at $\sqrt{s}$=8 TeV: up to 10.7 fb^{-1}

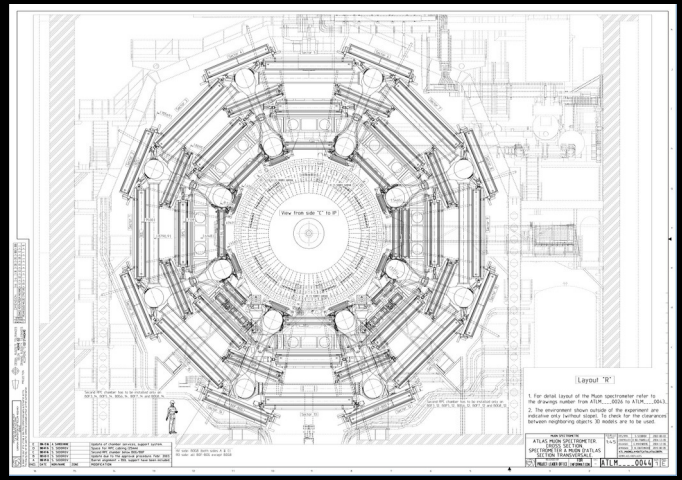
Fabiola Gianotti (CERN), representing the ATLAS Collaboration

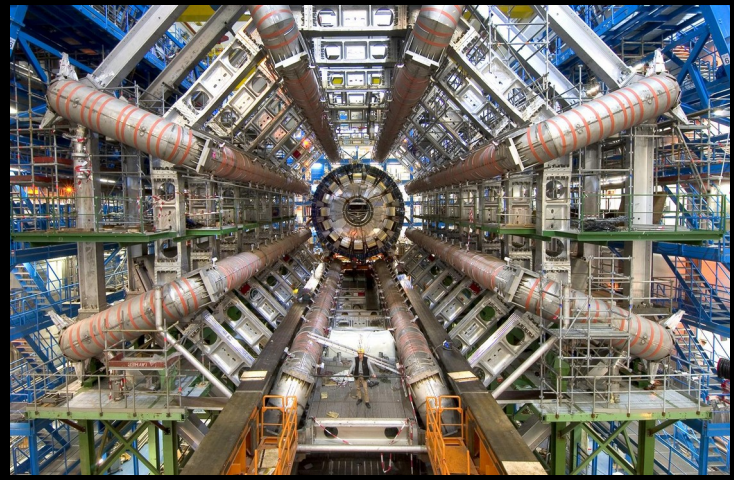


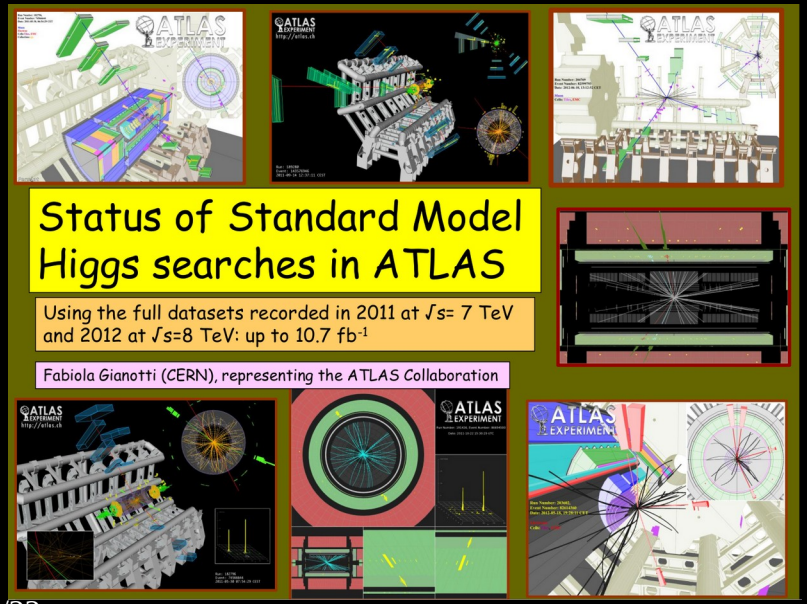





(a)
ATLAS
DETECTOR AND PHYSICS PERFORMANCE
TECHNICAL DESIGN REPORT
VOLUME I



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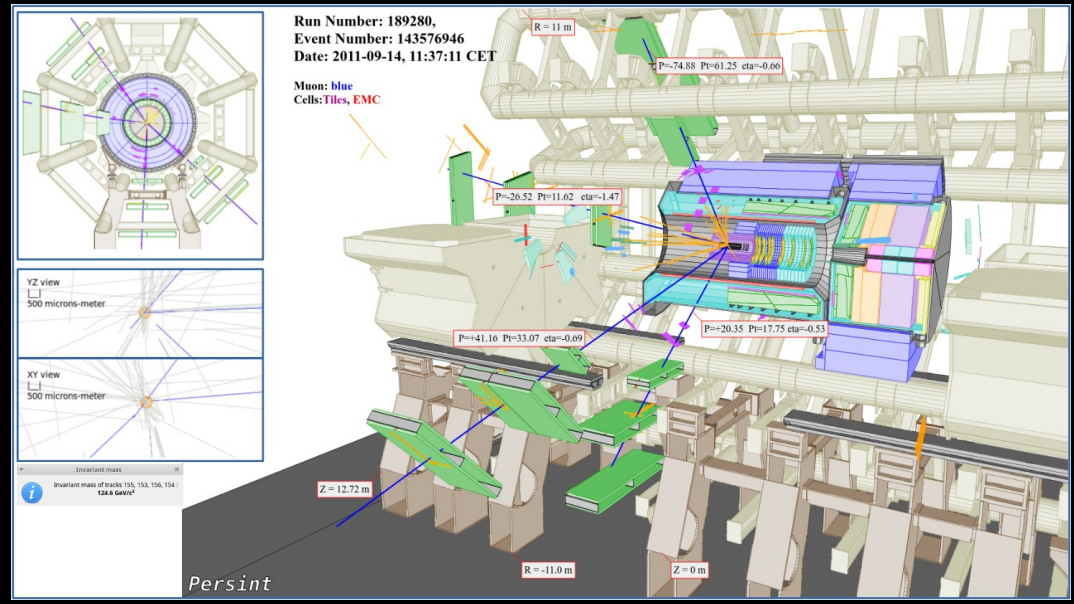
Run Number: 189280,
Event Number: 143576946
Date: 2011-09-14, 11:37:11 CET
Muon: blue
Cells: Tiles, EMC
YZ view
500 microns-meter
XY view
500 microns-meter
Persint