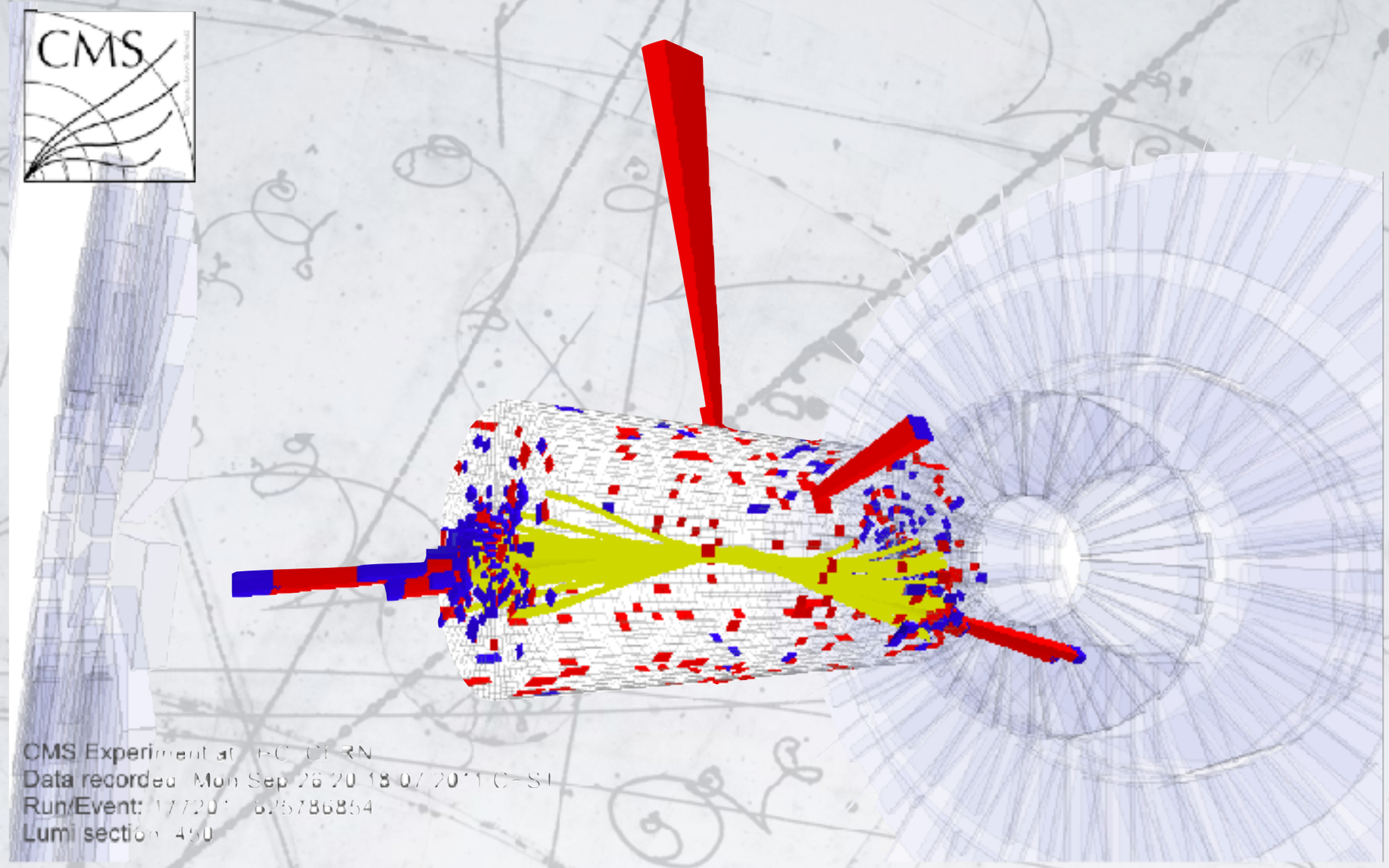
LA SCOPERTA DEL BOSONE DI HIGGS

Giovanni Organtini
Dip. di Fisica "Sapienza", Università di Roma & INFN-Sez. di Roma



COS'È UN BOSONE DI HIGGS?

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▶ François Englert
▶ Peter Higgs

All Nobel Prizes in Physics
All Nobel Prizes in 2013

The Nobel Prize in Physics 2013
François Englert & Peter Higgs

The Nobel Prize in Physics 2013

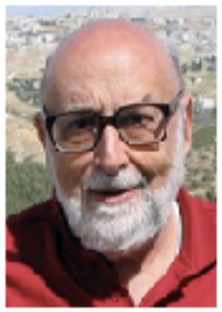

Photo: Privolet via Wikimedia Commons
François Englert

Photo: G. M. Greco via Wikimedia Commons
Peter W. Higgs

The Nobel Prize in Physics 2013 was awarded jointly to François Englert and Peter W. Higgs *"for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider"*

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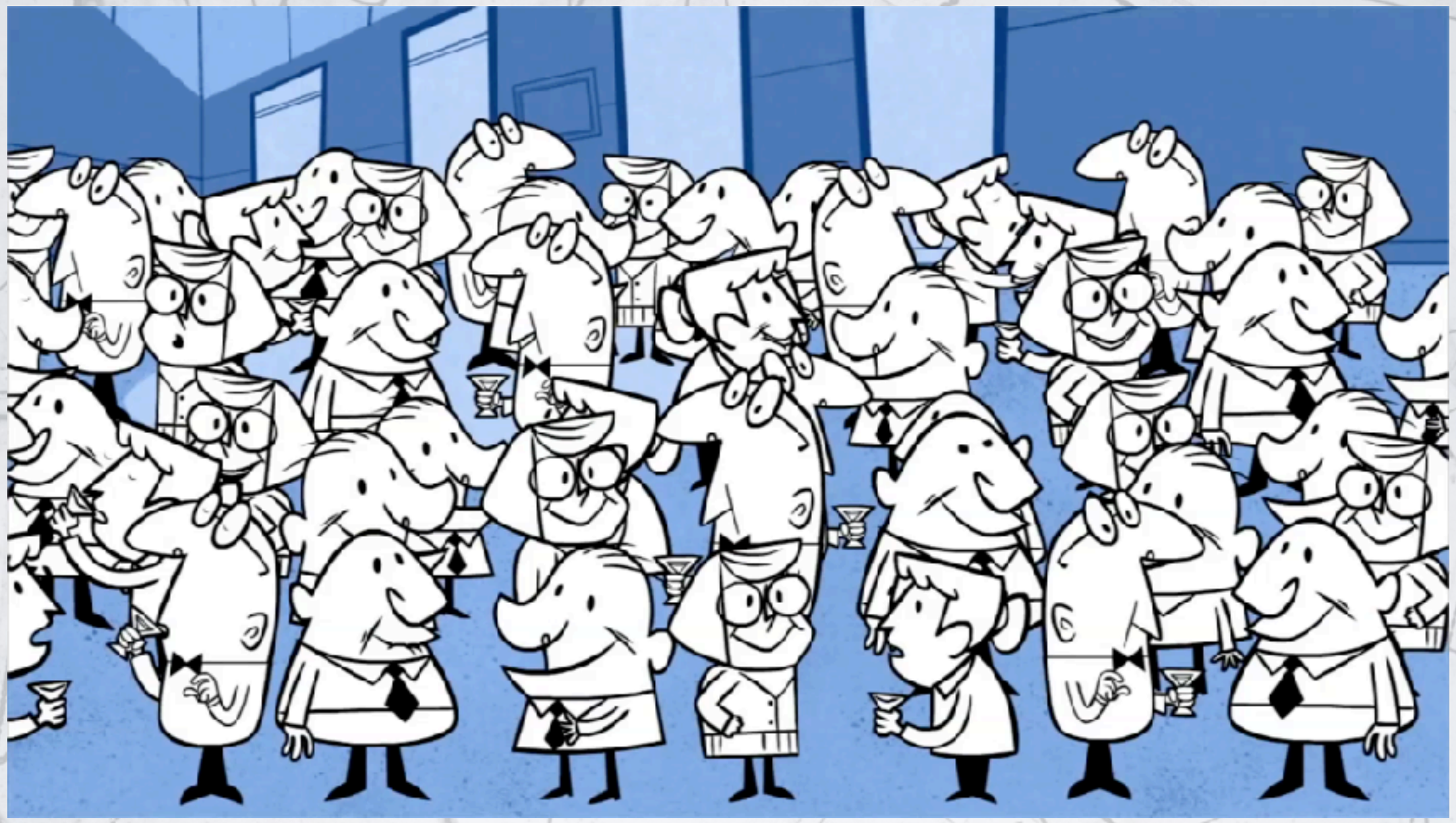
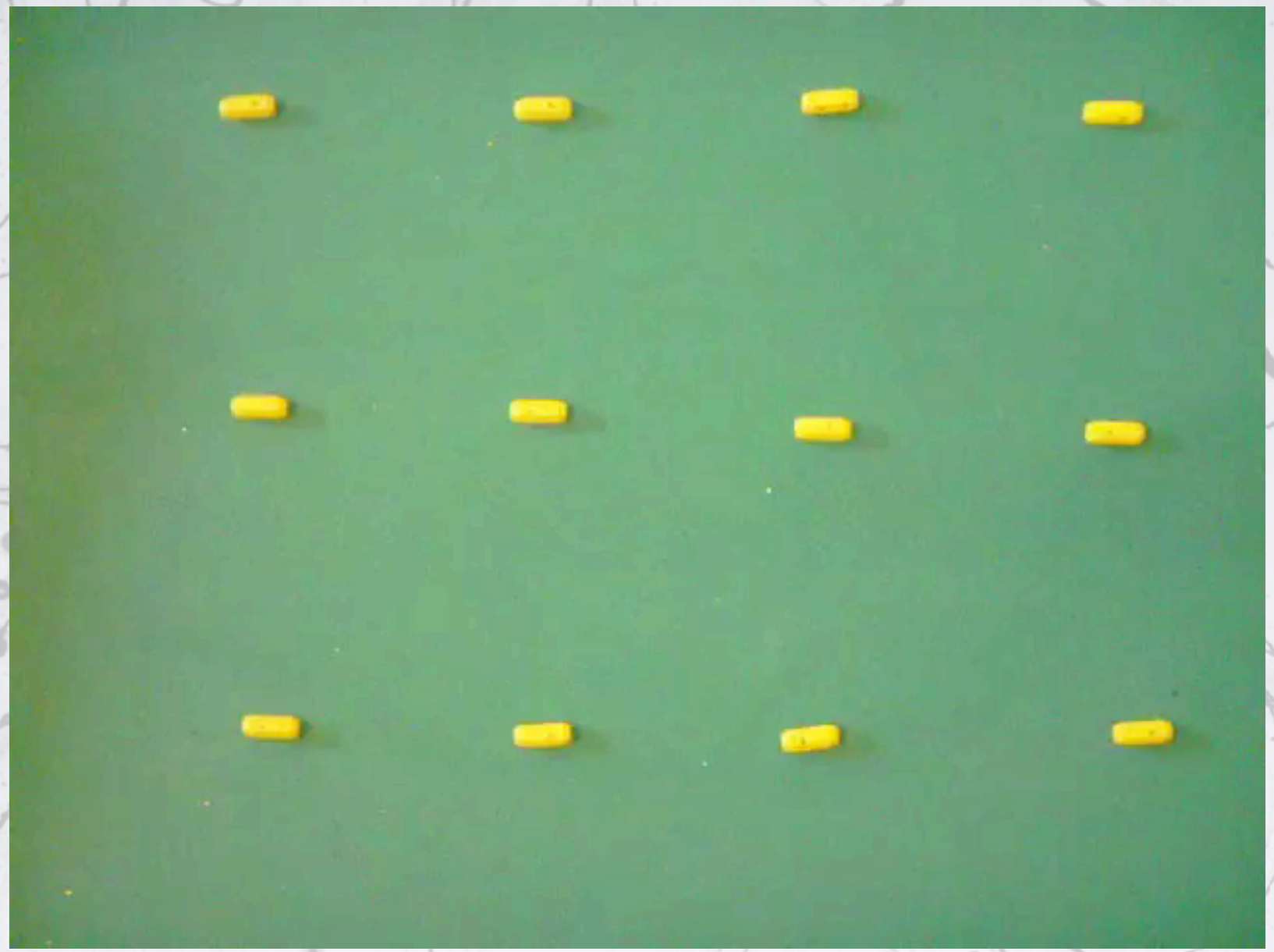
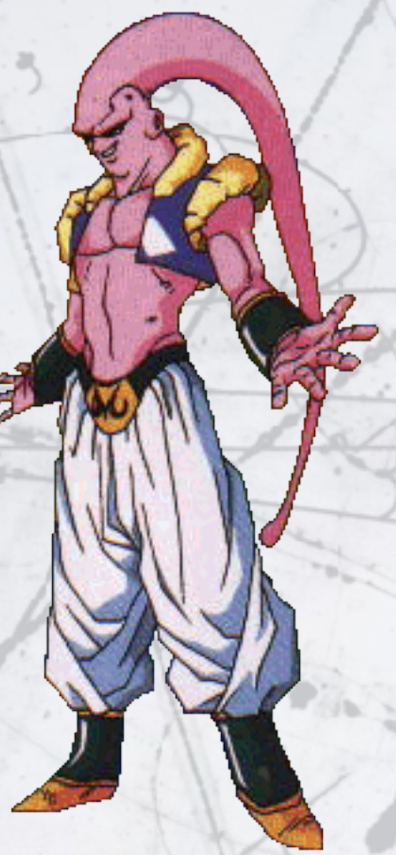
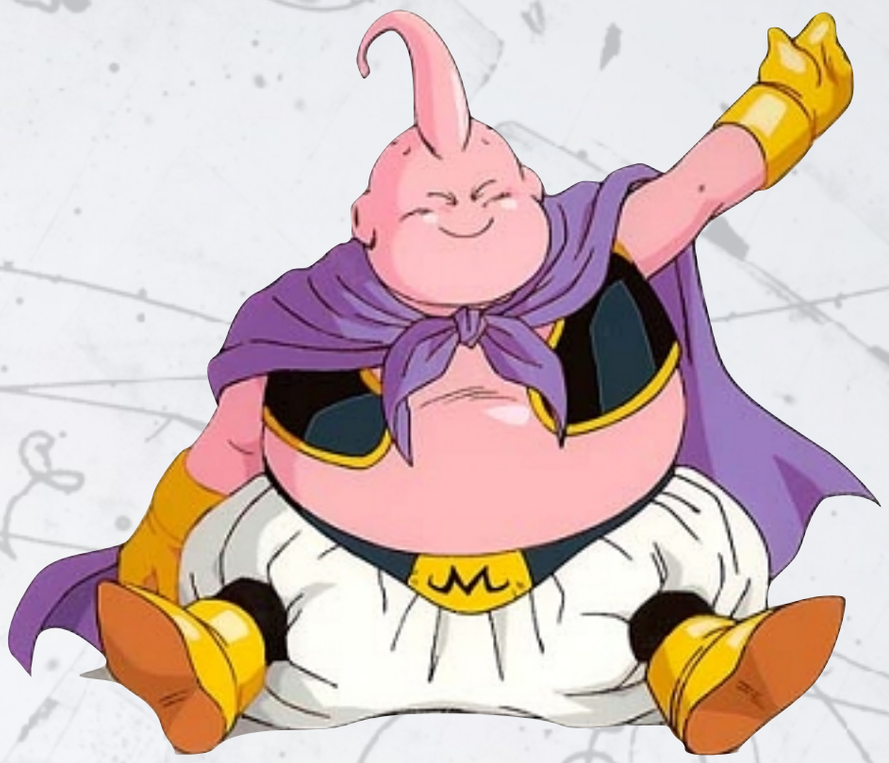


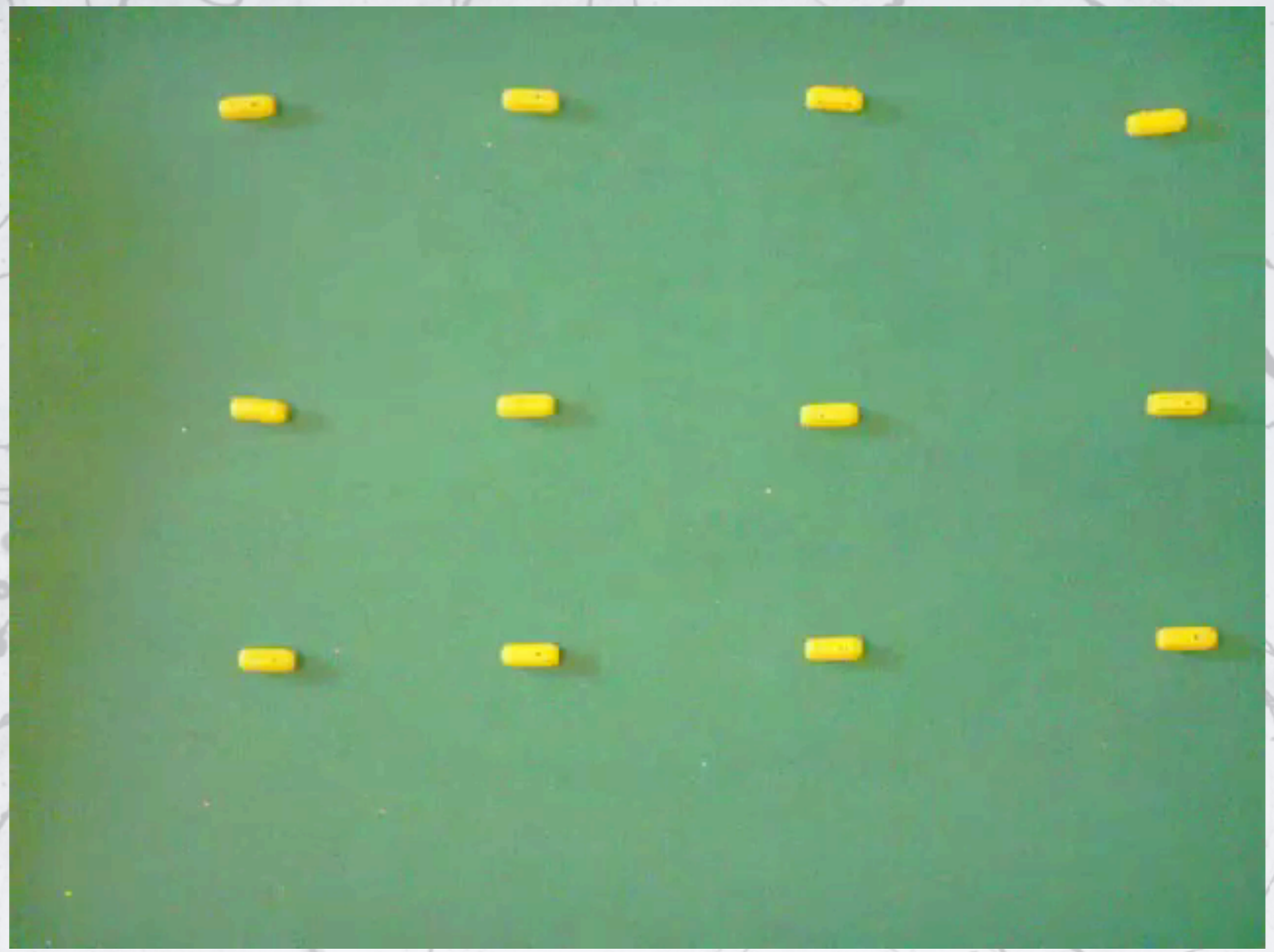


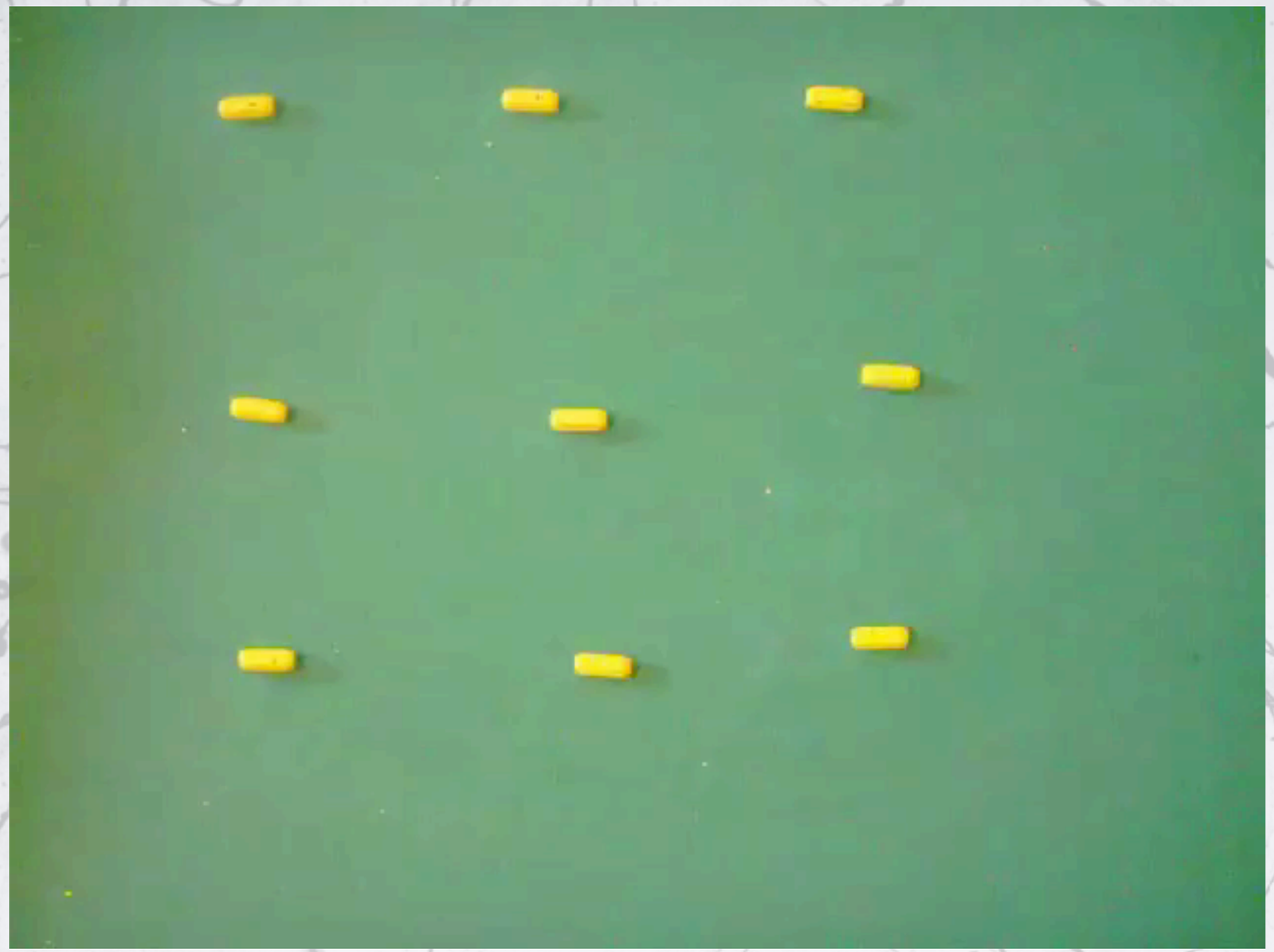


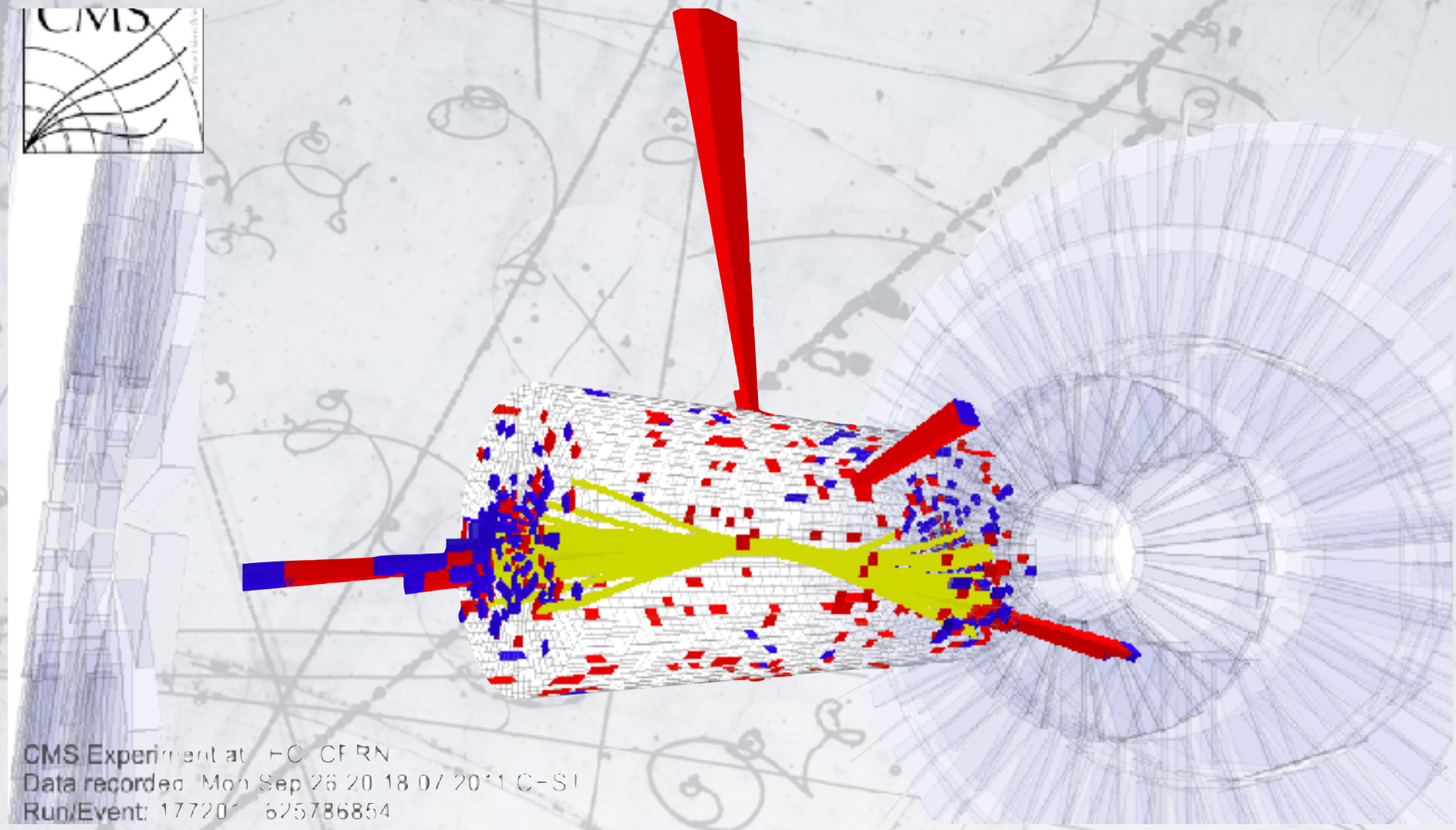
elettrone



muone

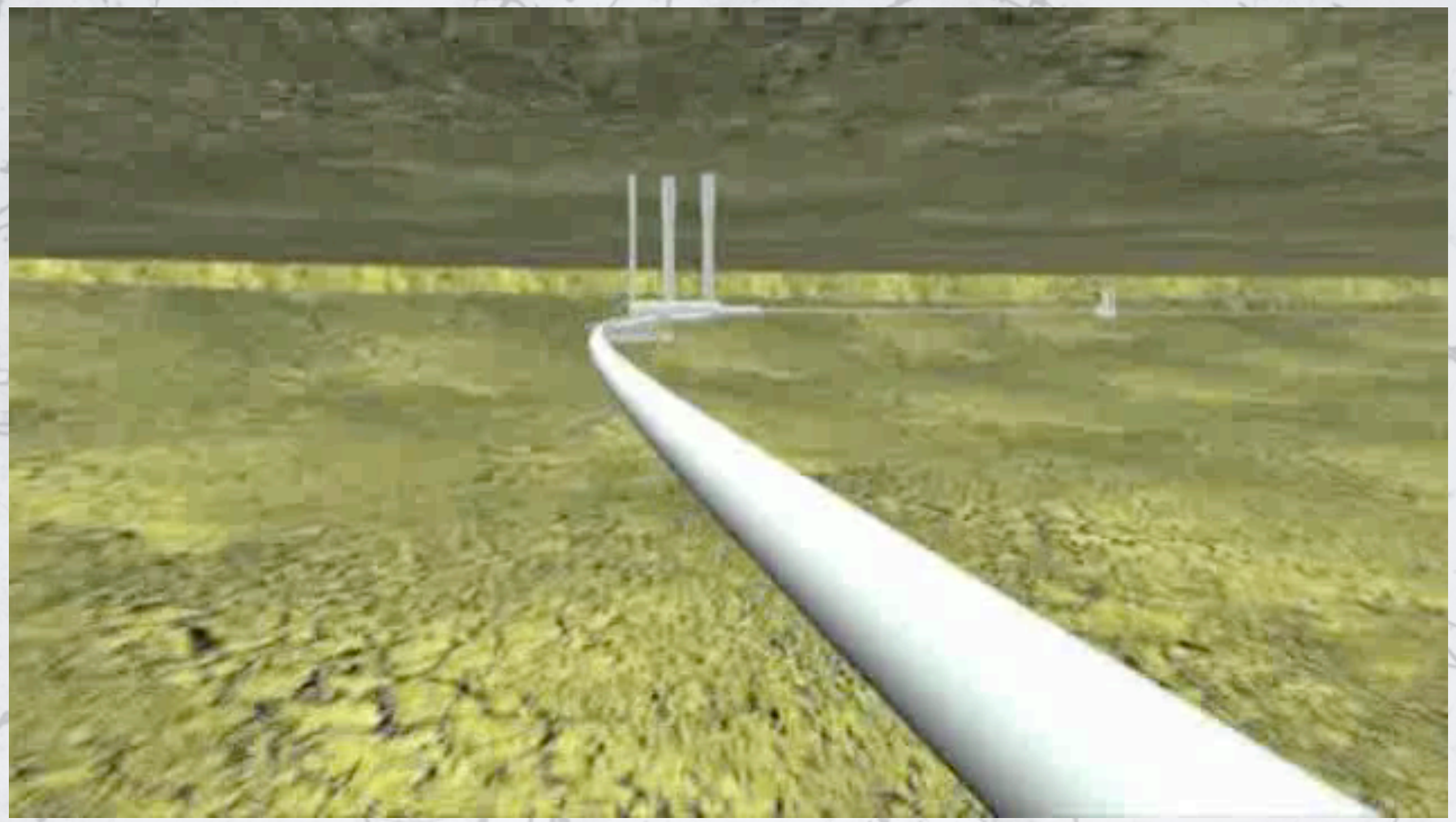


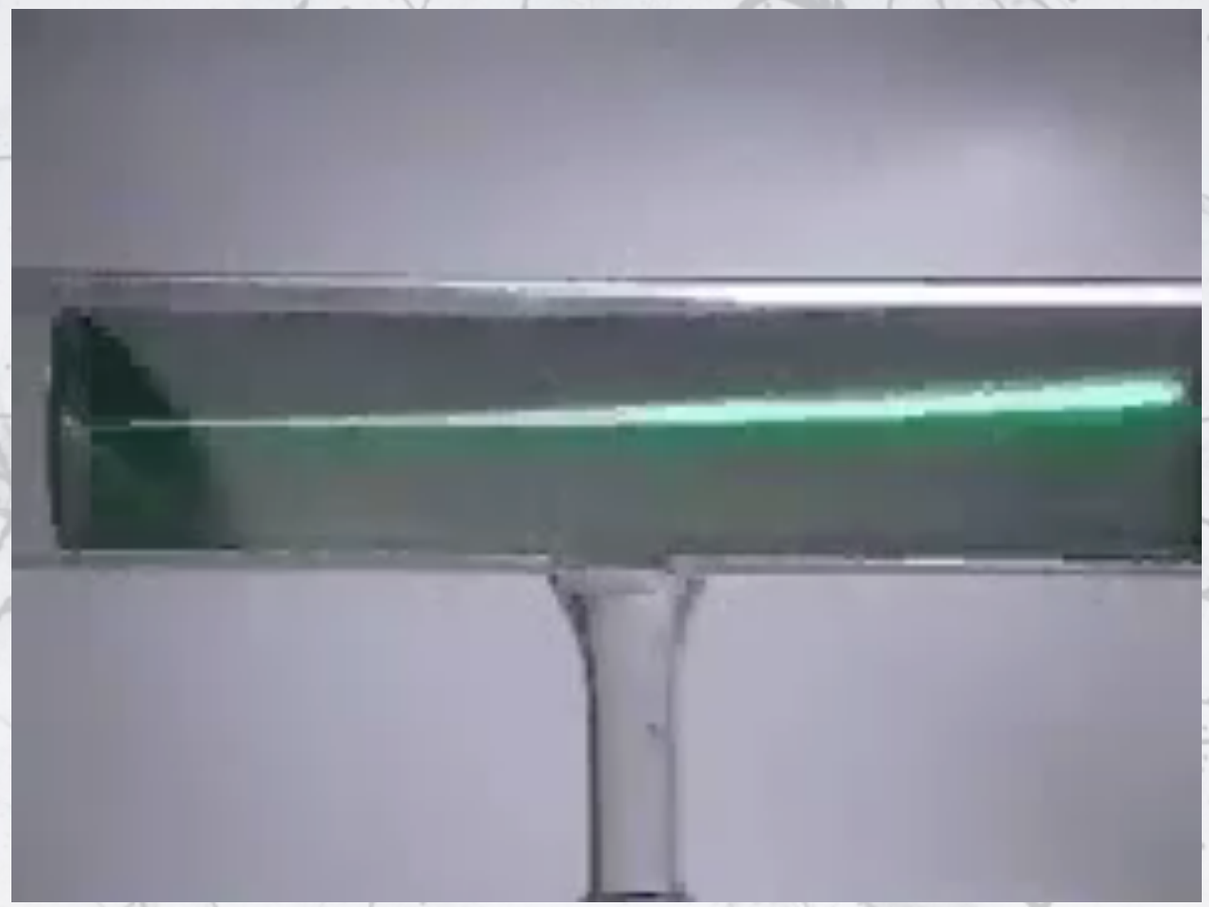




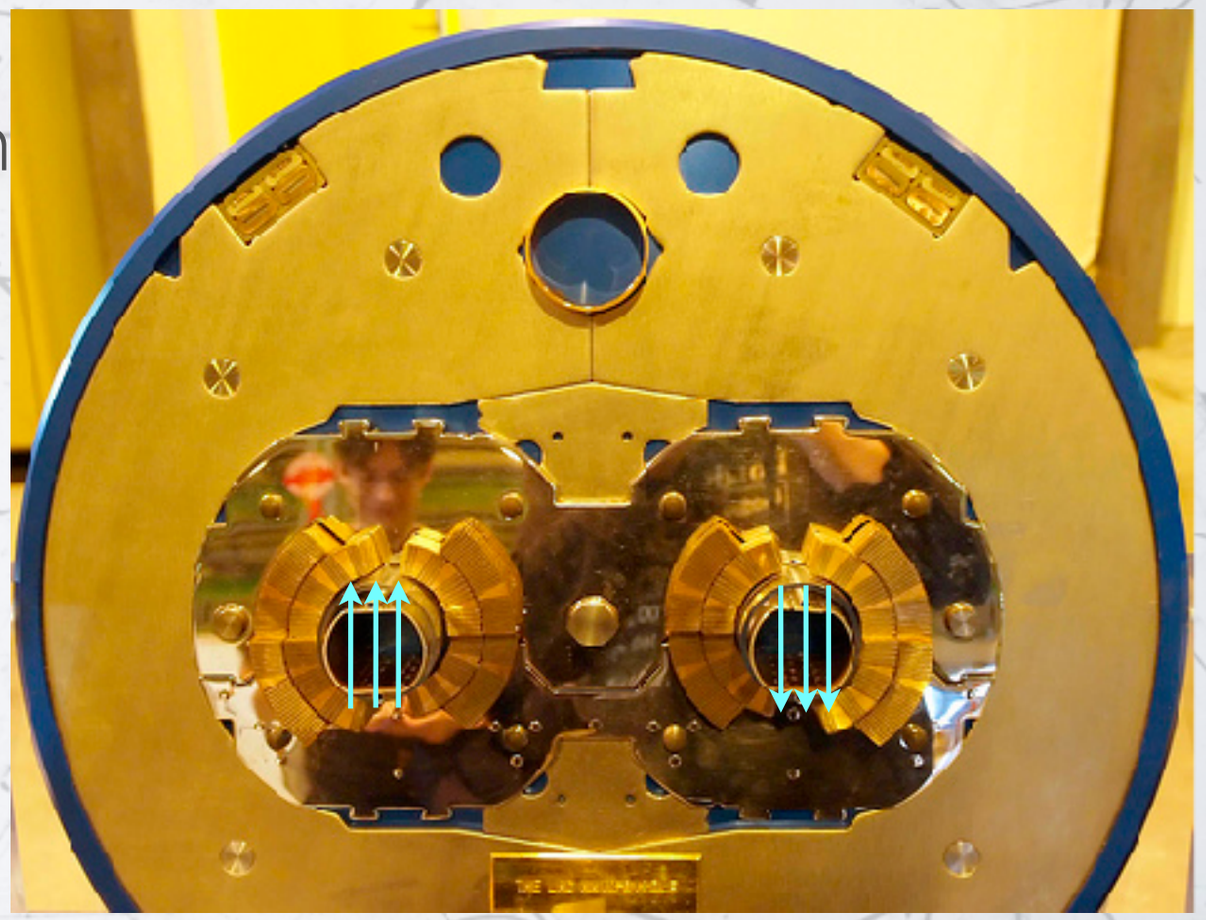
COME SI PRODUCE UN BOSONE DI HIGGS?

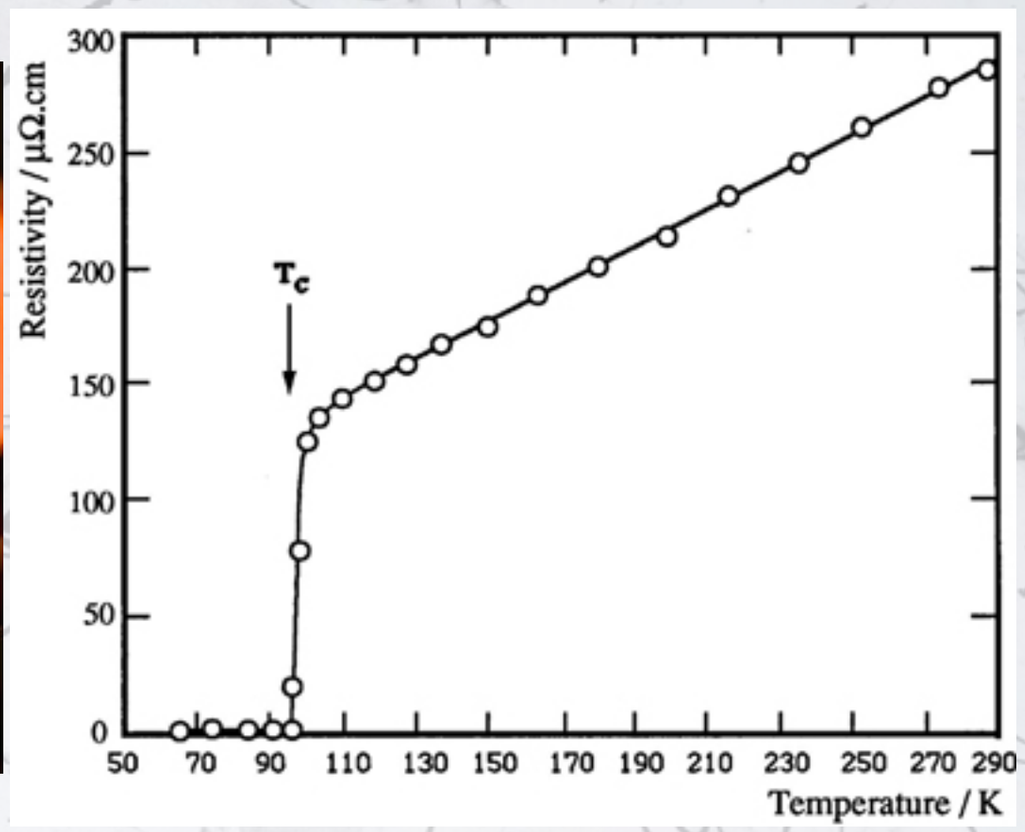
$E=mc^2$

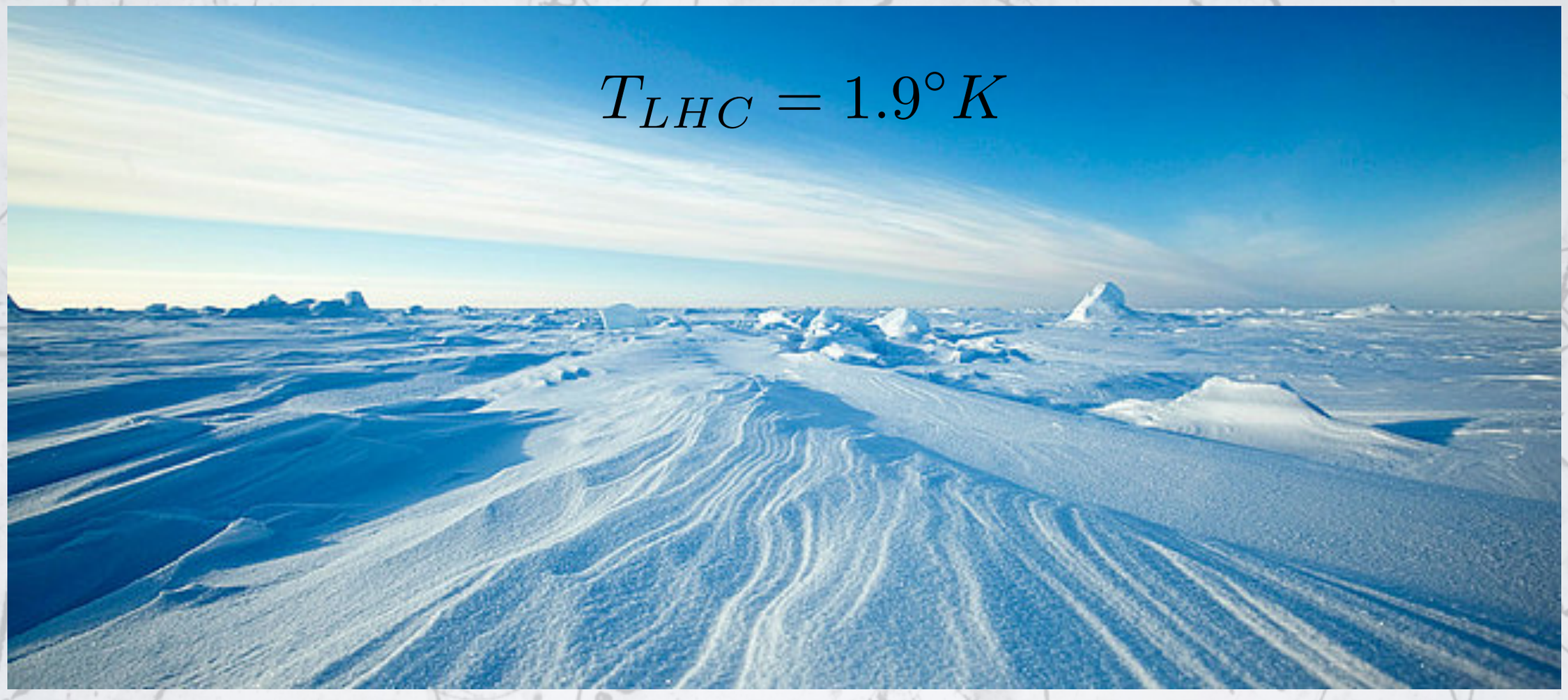




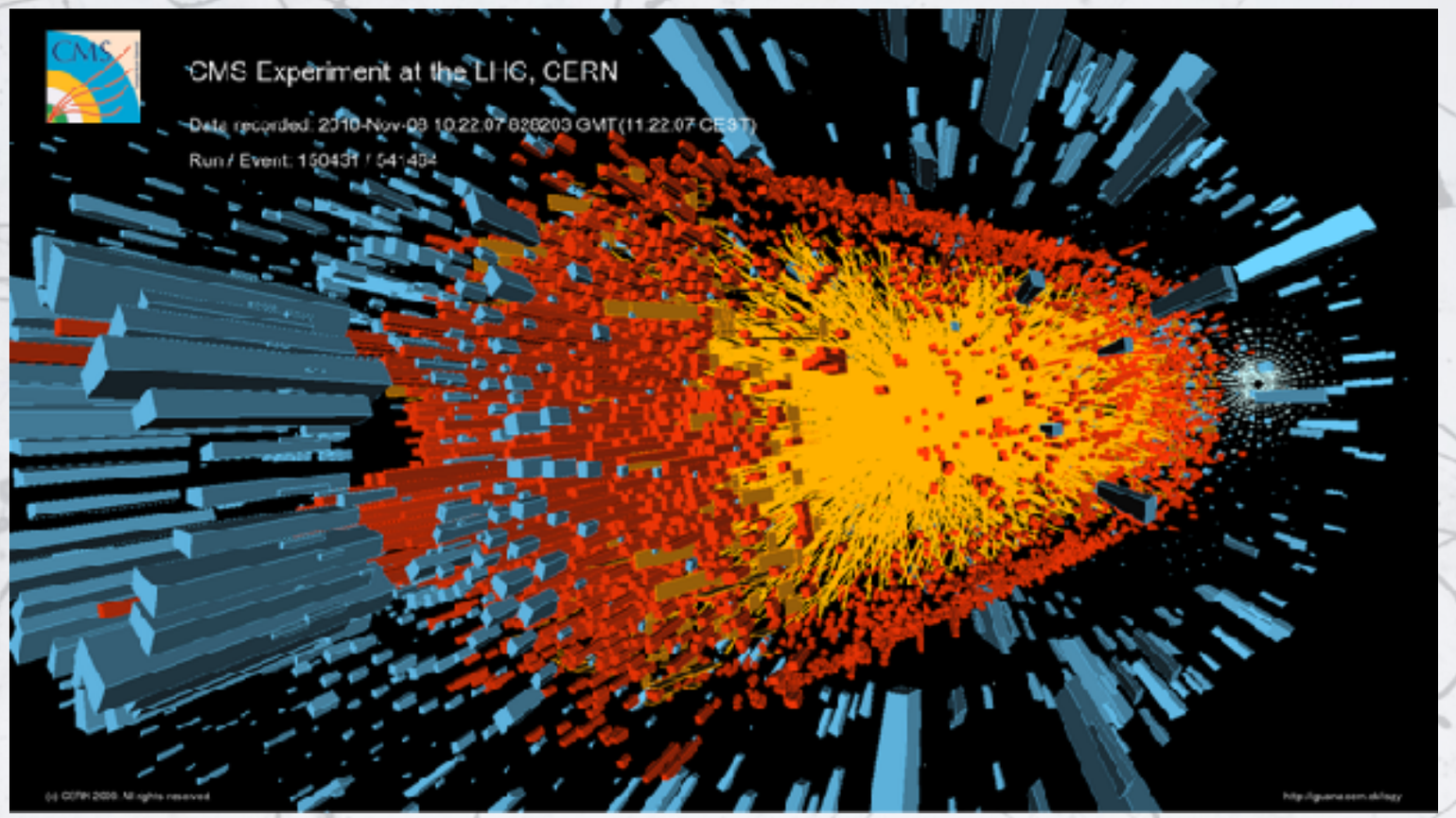
- 1232 dipoli magnetici
  - B = 8.33 T (100.000 volte più intenso di quello terrestre)
  - I = 12000 A (utenze domestiche: ~13 A)
  - lunghezza del dipolo:14.3 m
  - 1 miliardo di km di cavo




Resistivity / μΩ.cm
300
250
200
150
100
50
0
T_c
50
70
90
110
130
150
170
190
210
230
250
270
290
Temperature / K


$T_{LHC} = 1.9° K$

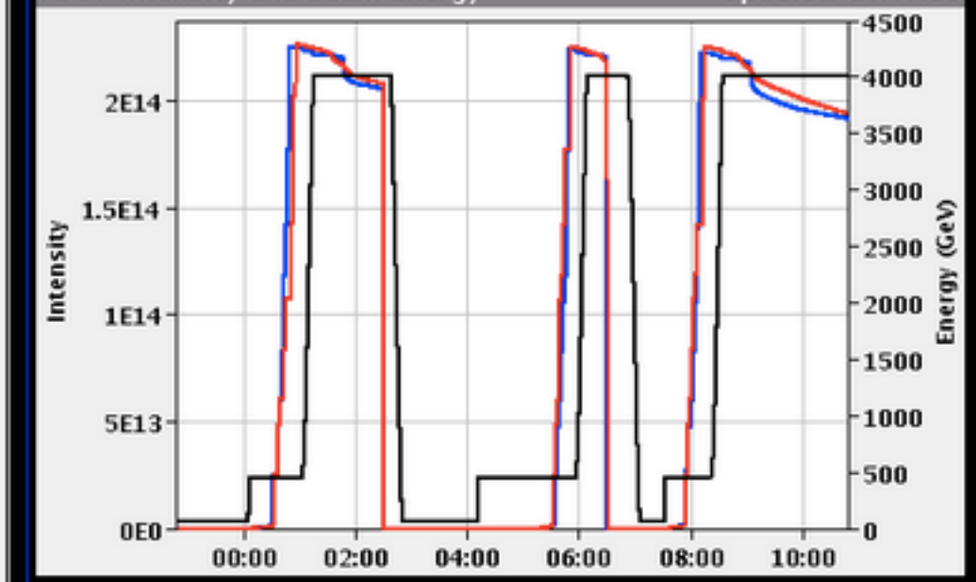
$T_{Coll} > 100000\ T_{Sun}$

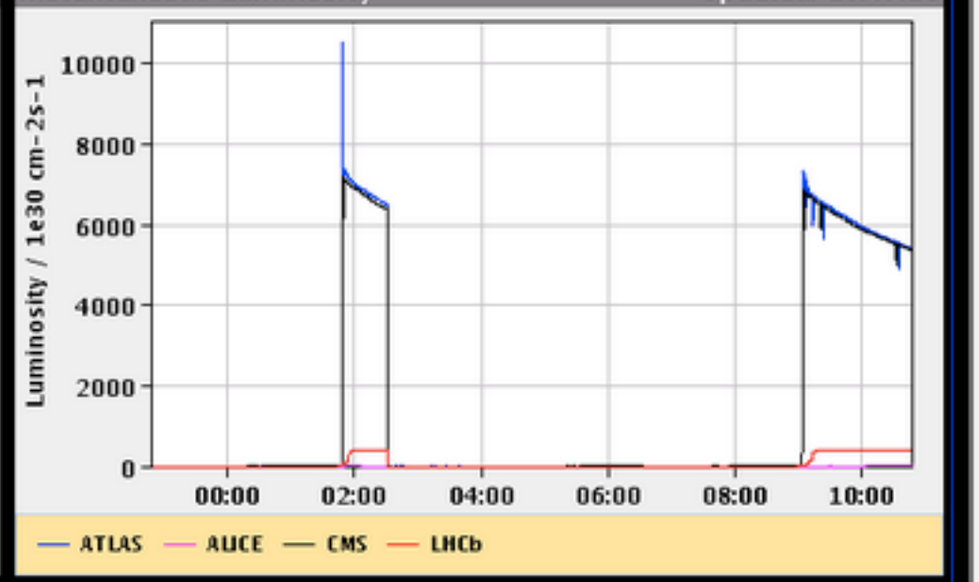


LHC Page1 | Fill: 3005 | E: 4000 GeV | t(SB): 01:42:50 | 26-08-12 10:47:18

PROTON PHYSICS: STABLE BEAMS

Energy:	4000 GeV	I(B1):	1.95e+14	I(B2):	1.96e+14



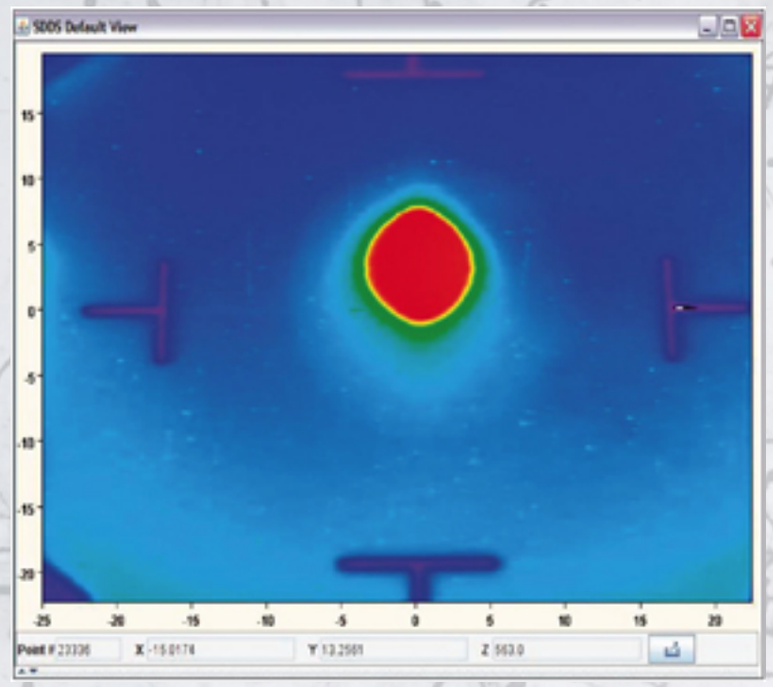


Comments 26-08-2012 07:39:54 :

Filling for physics

BIS status and SMP flags	B1	B2
Link Status of Beam Permits	true	true
Global Beam Permit	true	true
Setup Beam	false	false
Beam Presence	true	true
Moveable Devices Allowed In	true	true
Stable Beams	true	true

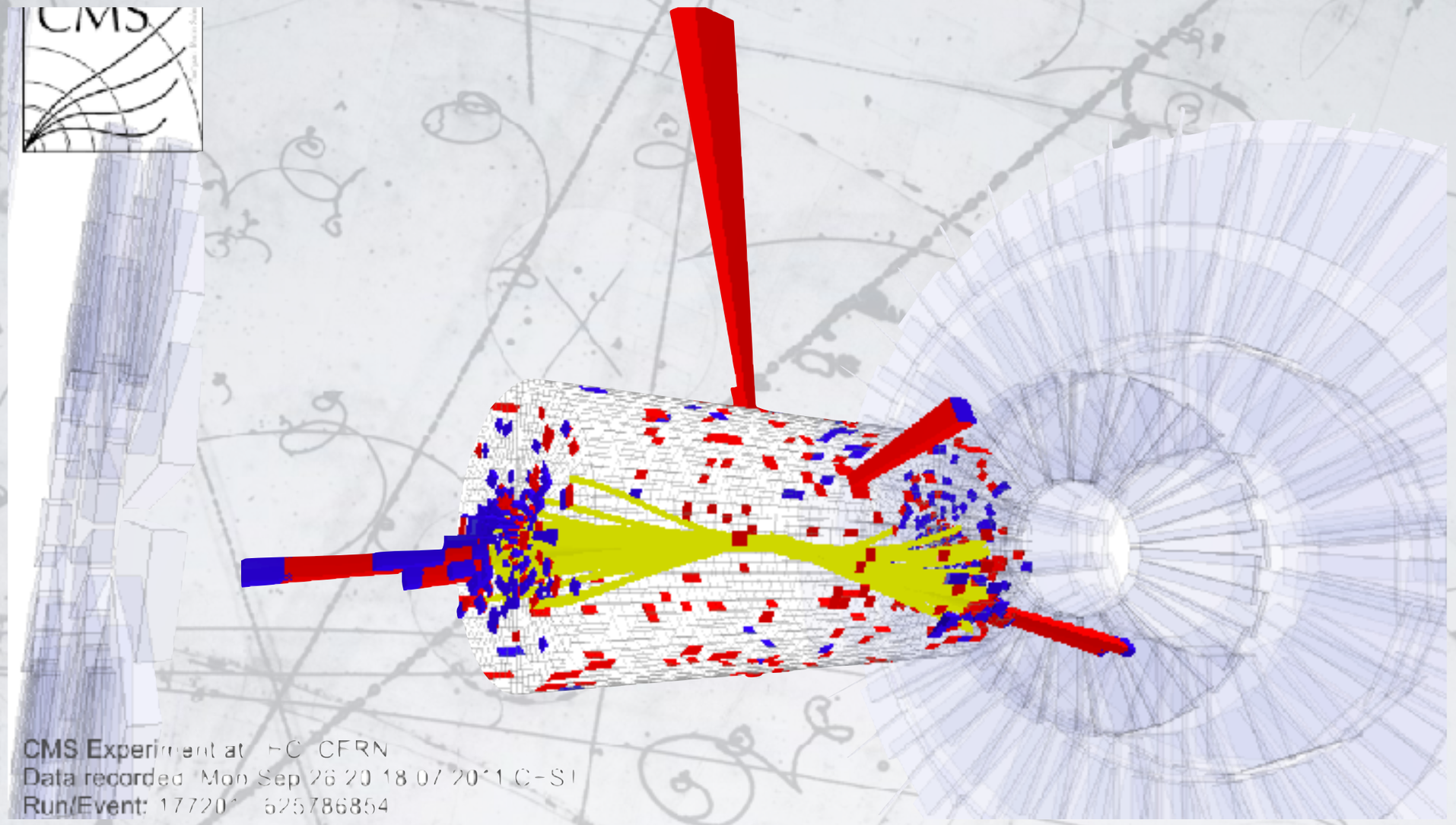
AFS: 50ns_1374_1368_0_1262_144bpi12inj | PM Status B1: ENABLED | PM Status B2: ENABLED



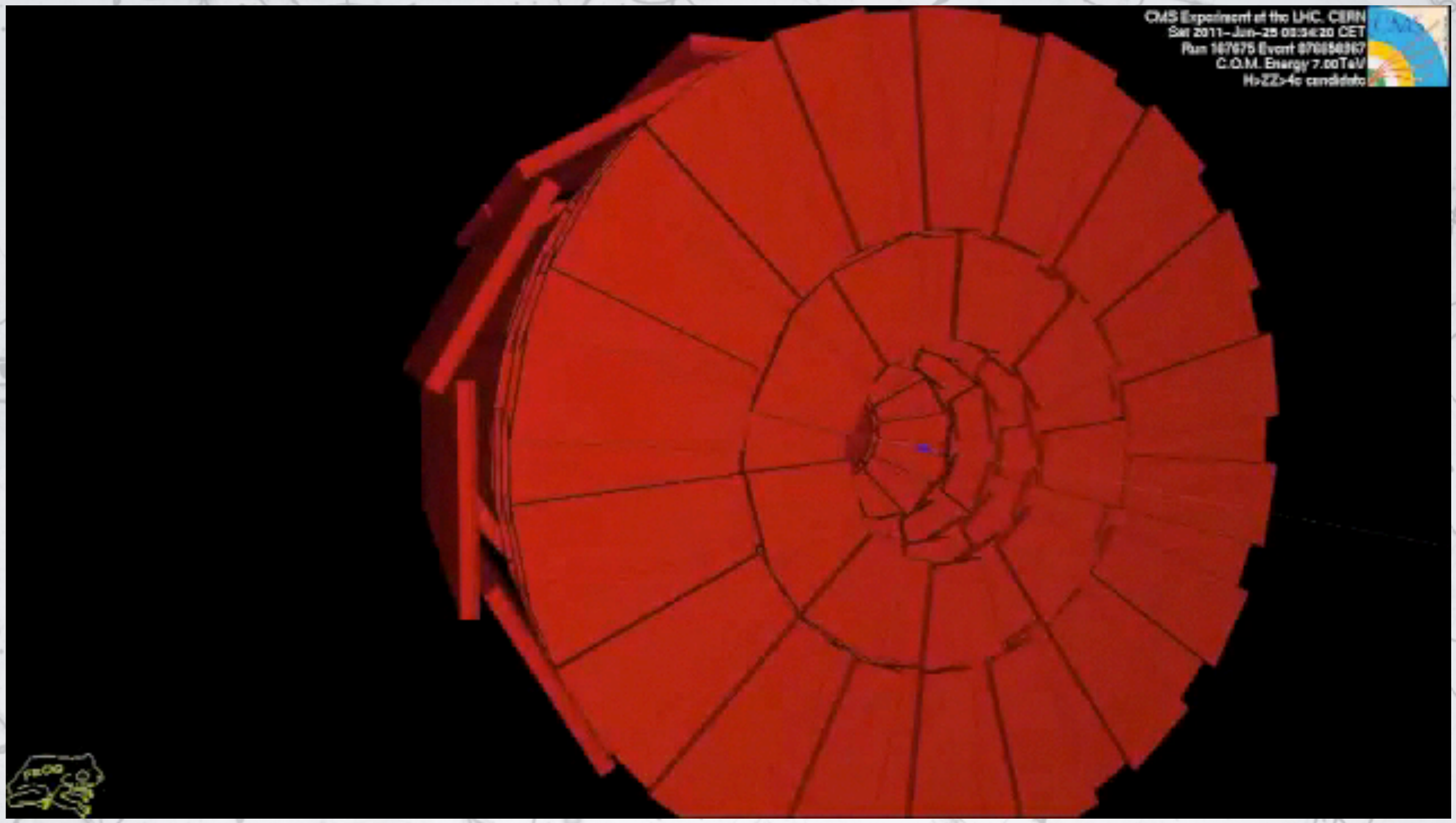
E_{LHC}=360 MJ

E_{FR}=900 MJ

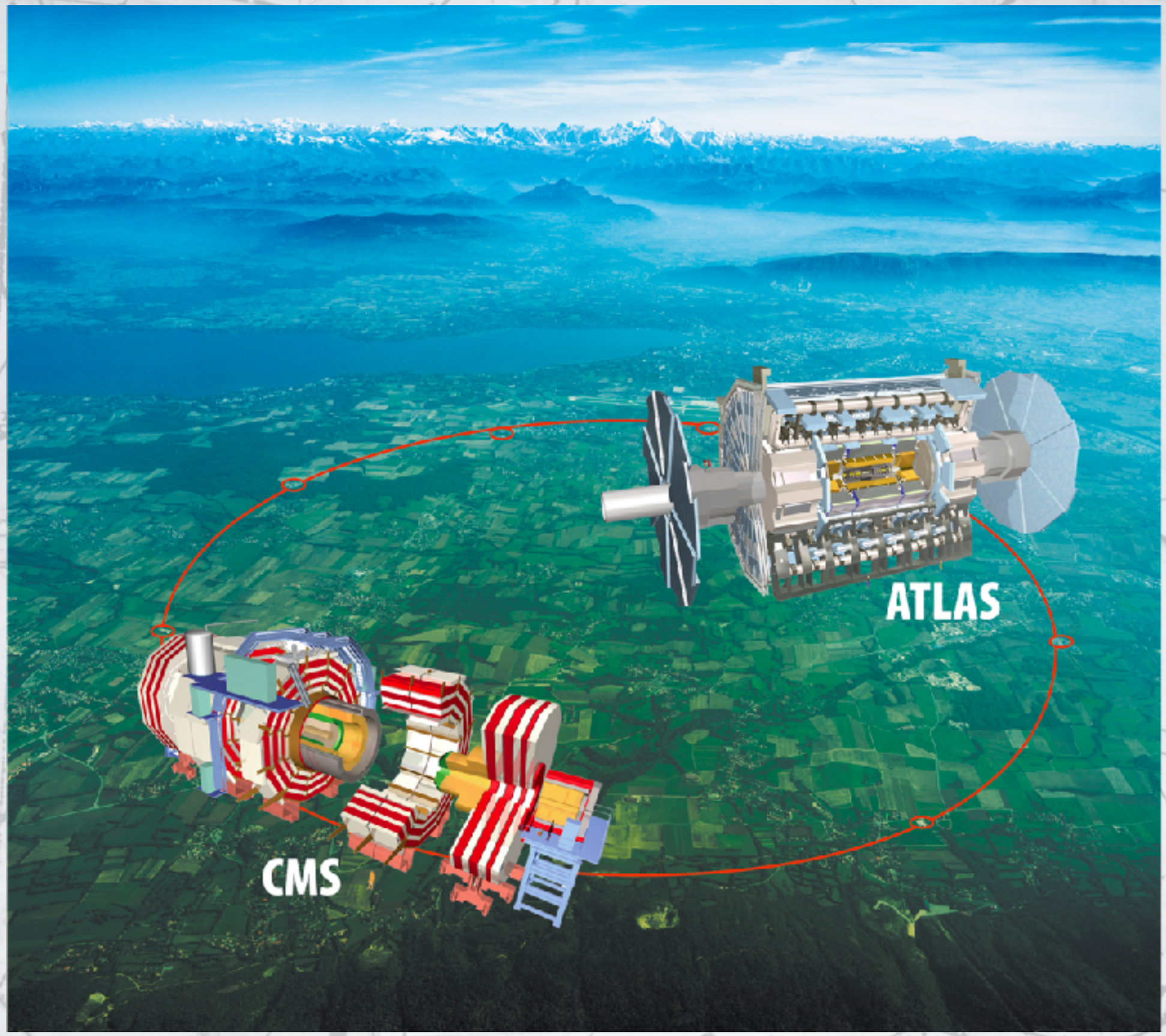
2 motrici + 11 carrozze @ 200 km/h



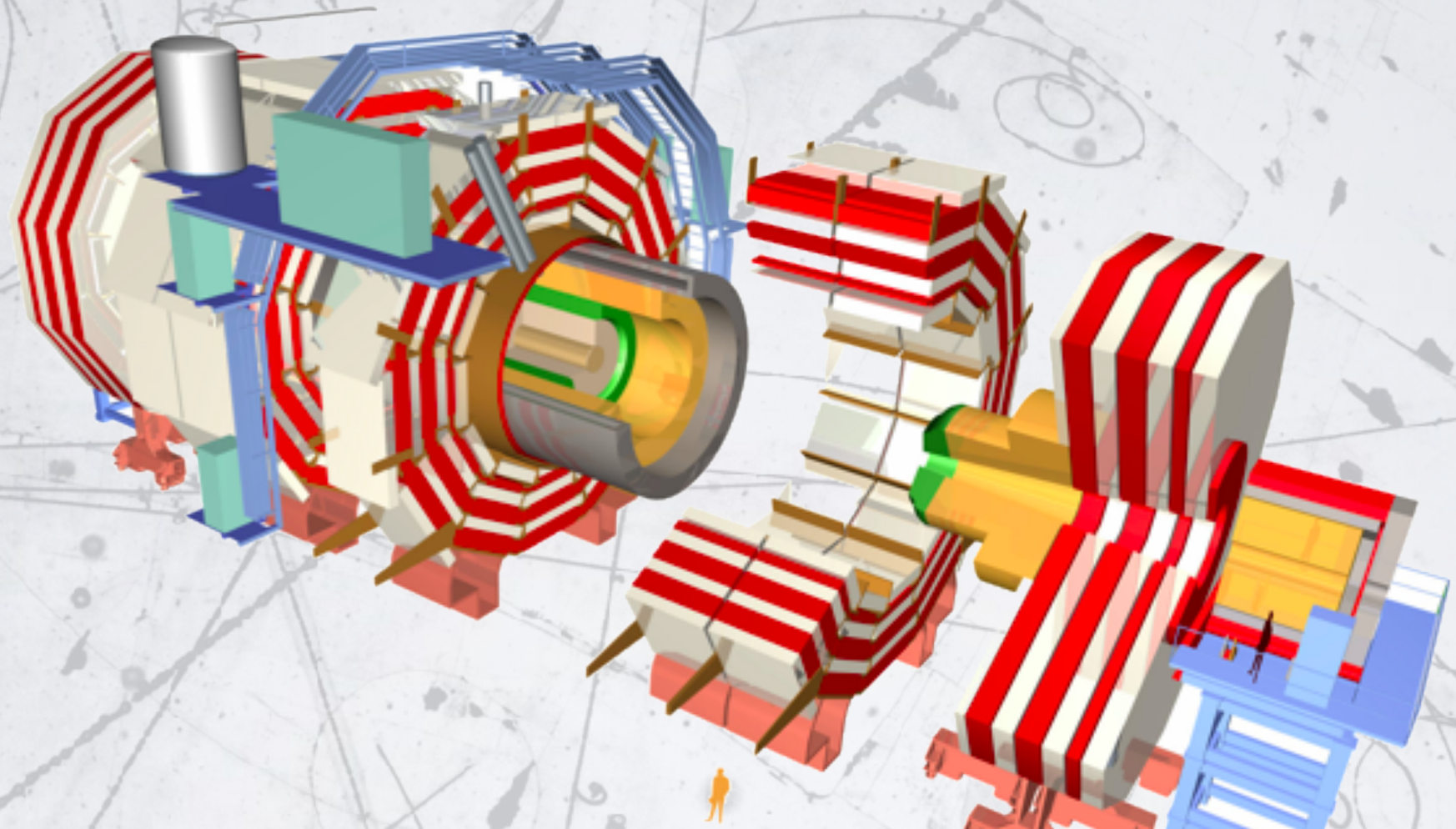
COME SI OSSERVA UN BOSONE DI HIGGS?


CMS Experiment at the LHC, CERN
Sat 2011-Jun-25 03:34:20 CET
Run 167675 Event 870858867
C.O.M. Energy 7.00TeV
H>ZZ>4e candidate

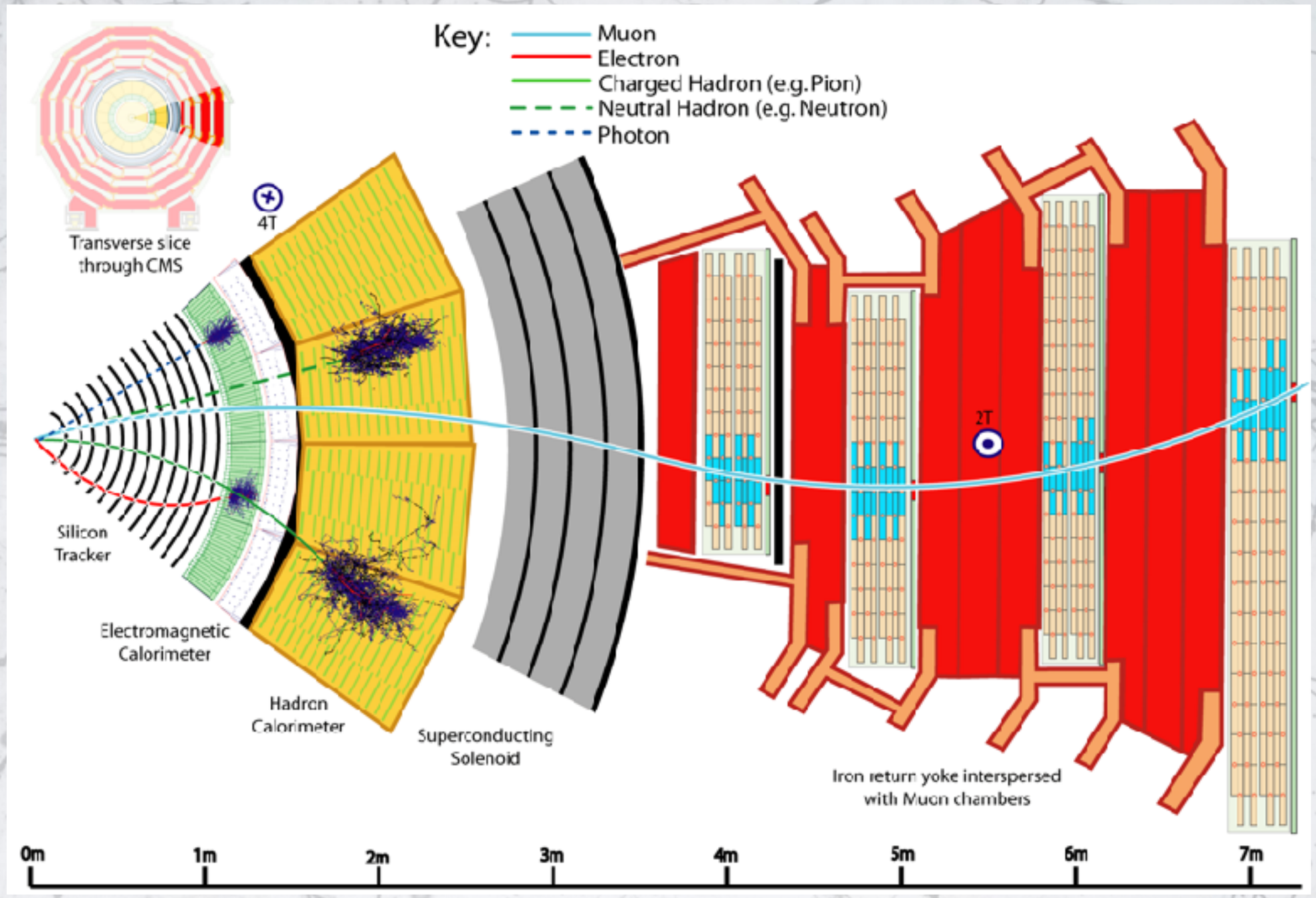
SULLE TRACCE DELLE PARTICELLE


ATLAS
CMS

UN RIVELATORE



UN RIVELATORE DI PARTICELLE



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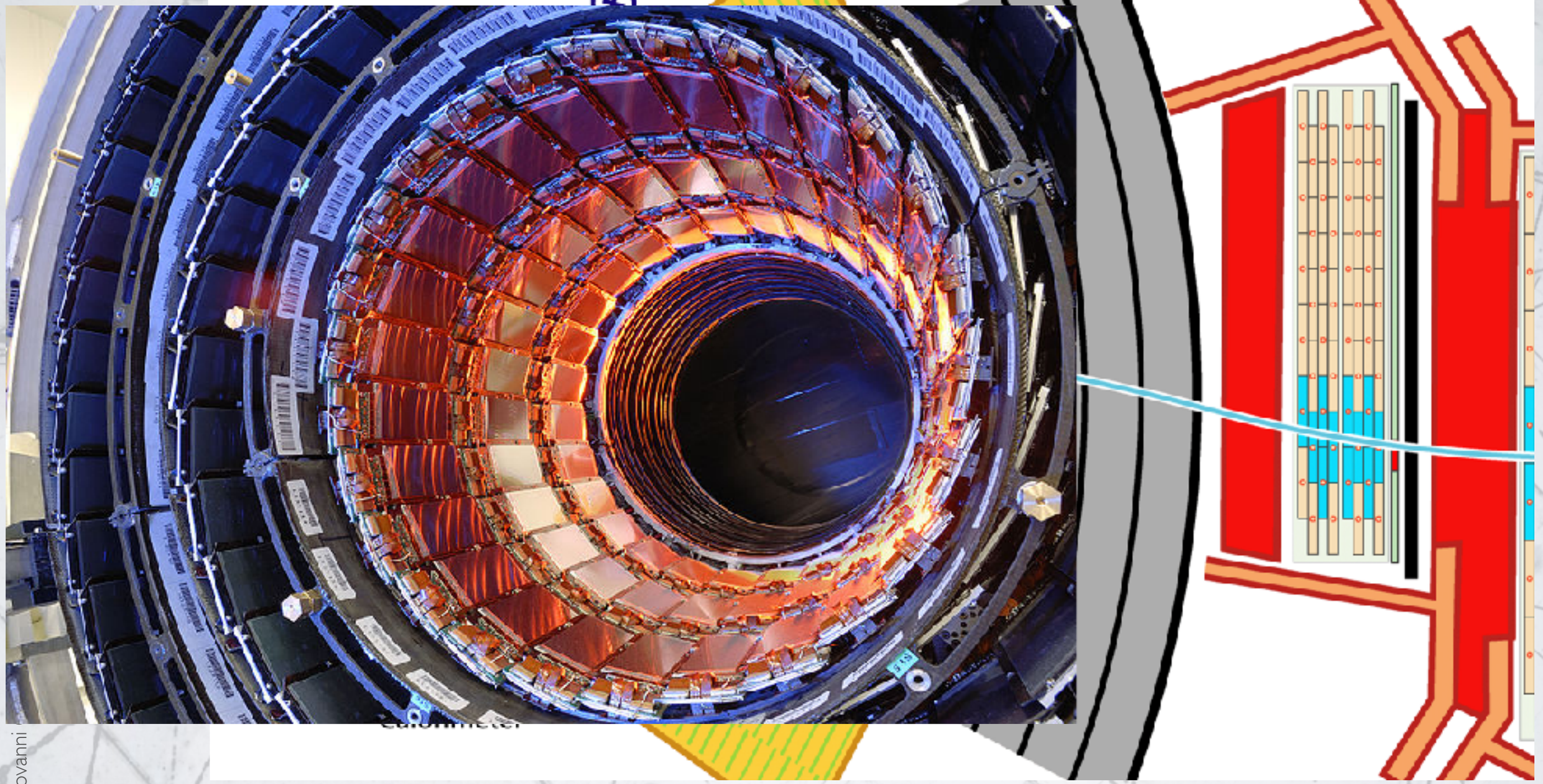
UN RIVELATORE DI PARTICELLE



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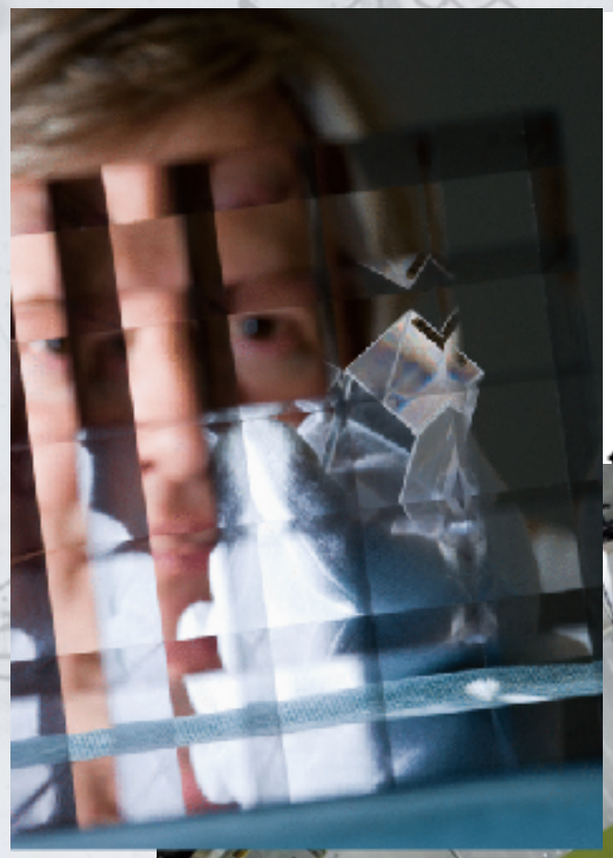

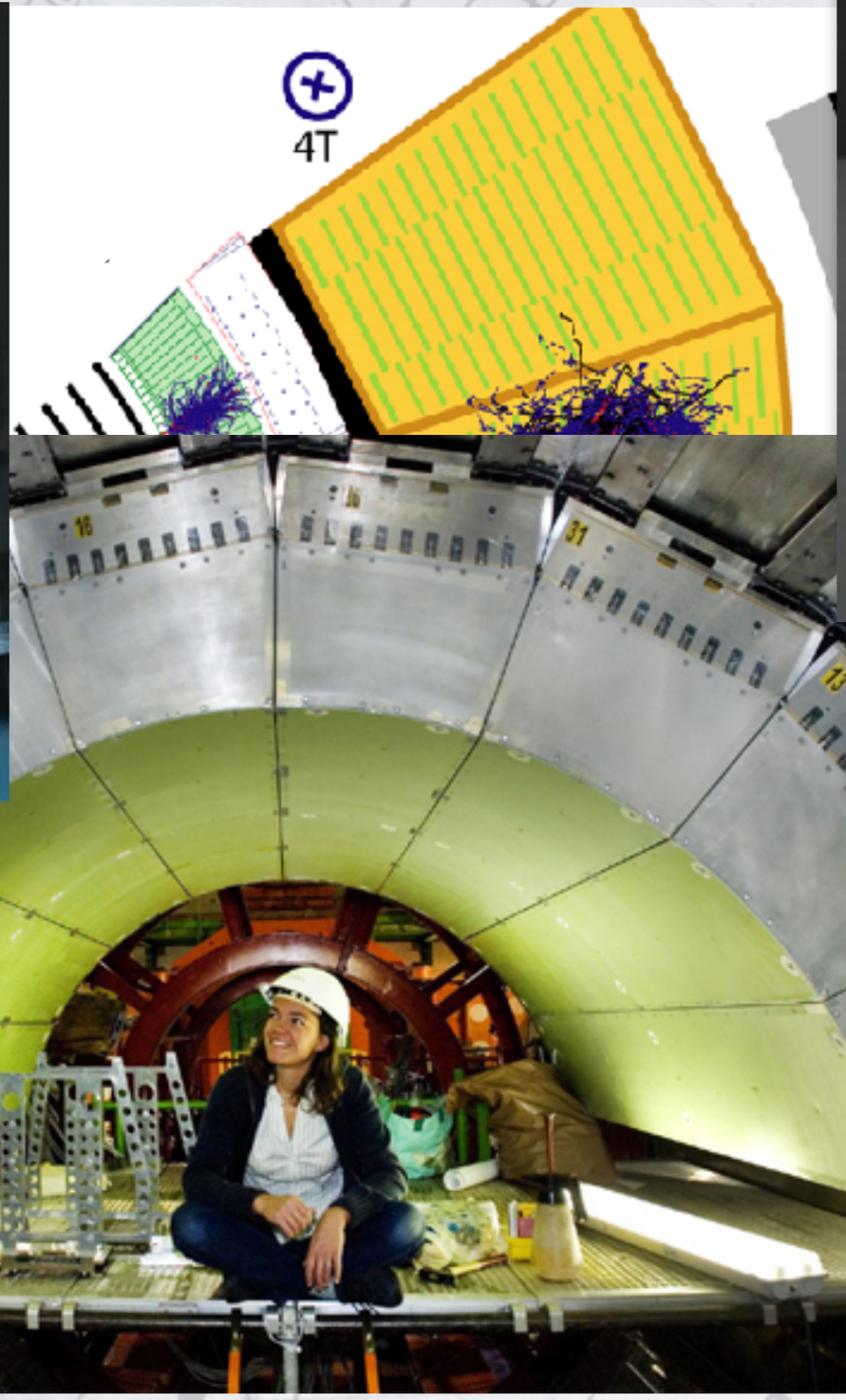

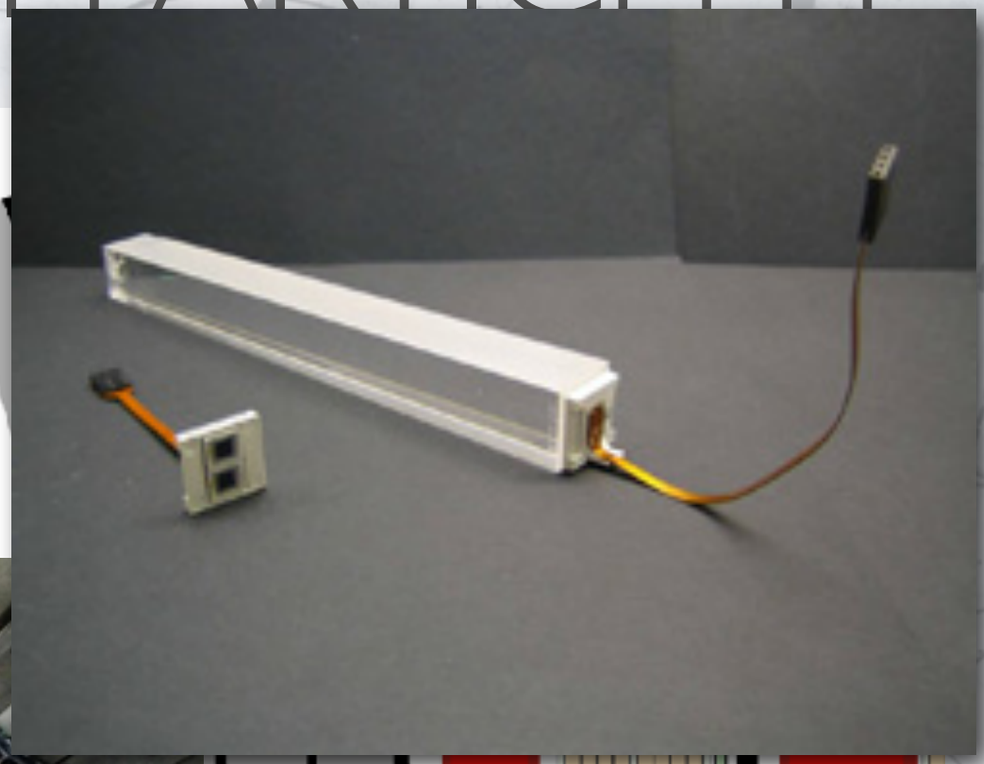

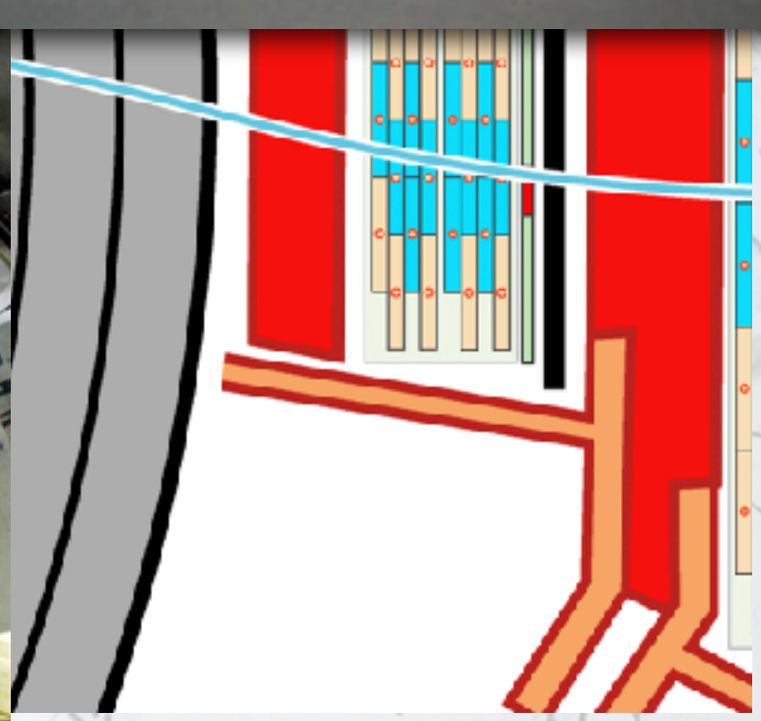

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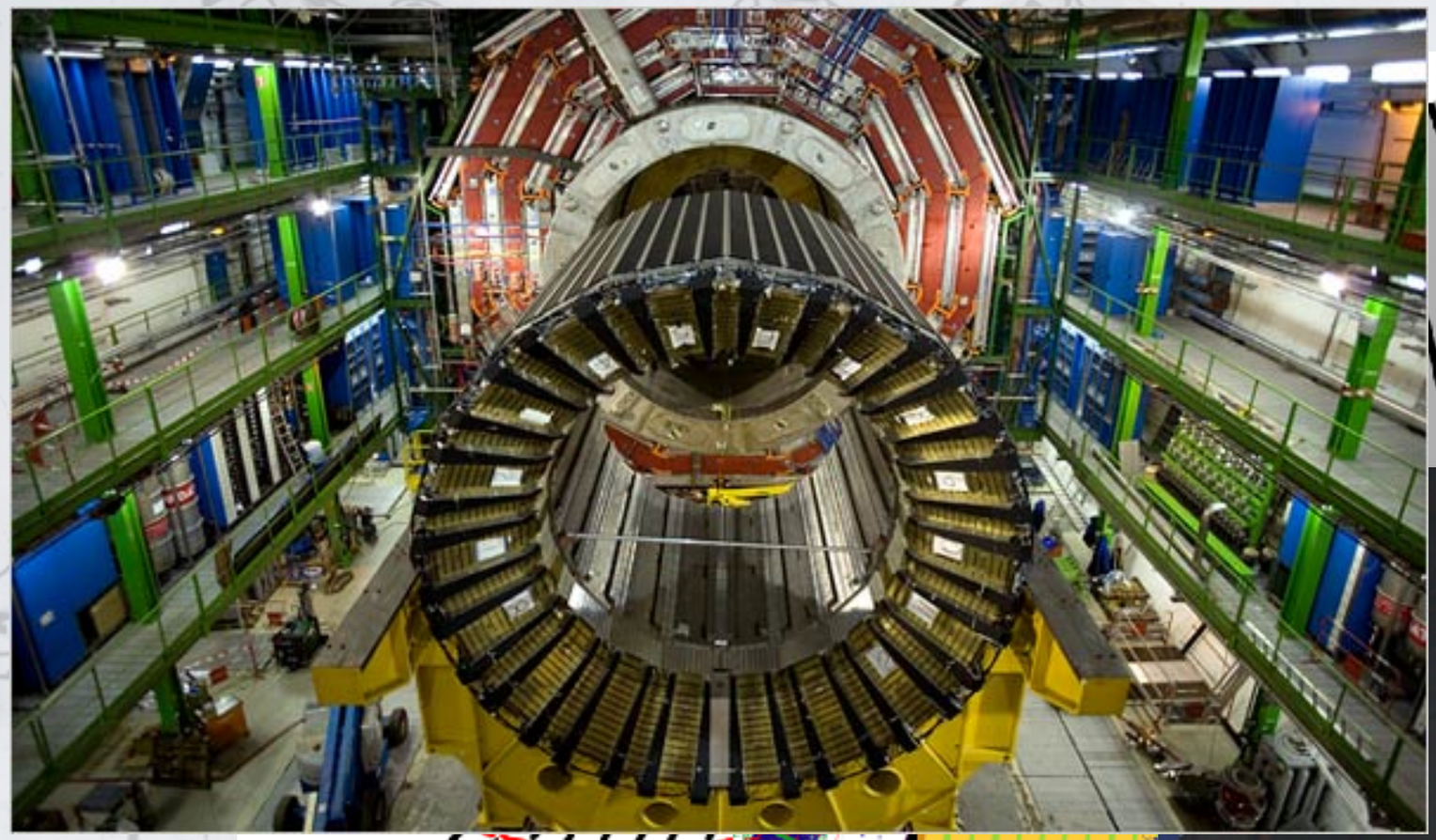

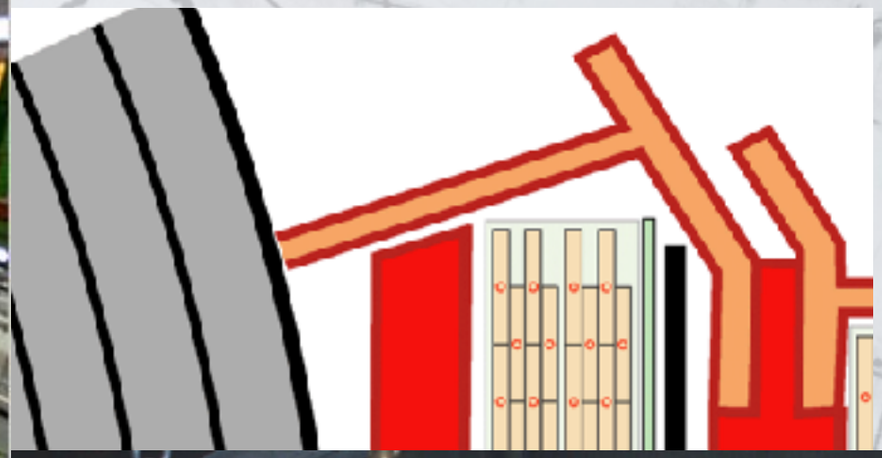

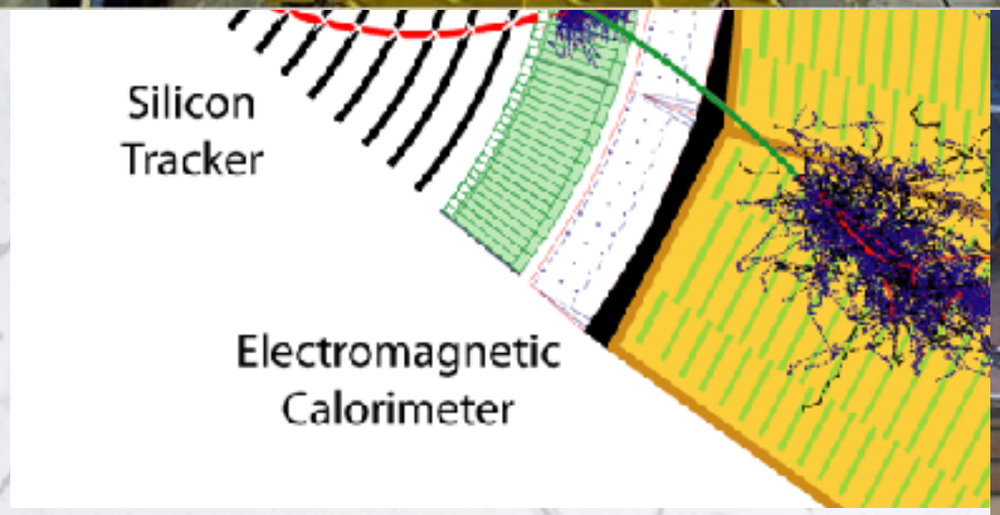

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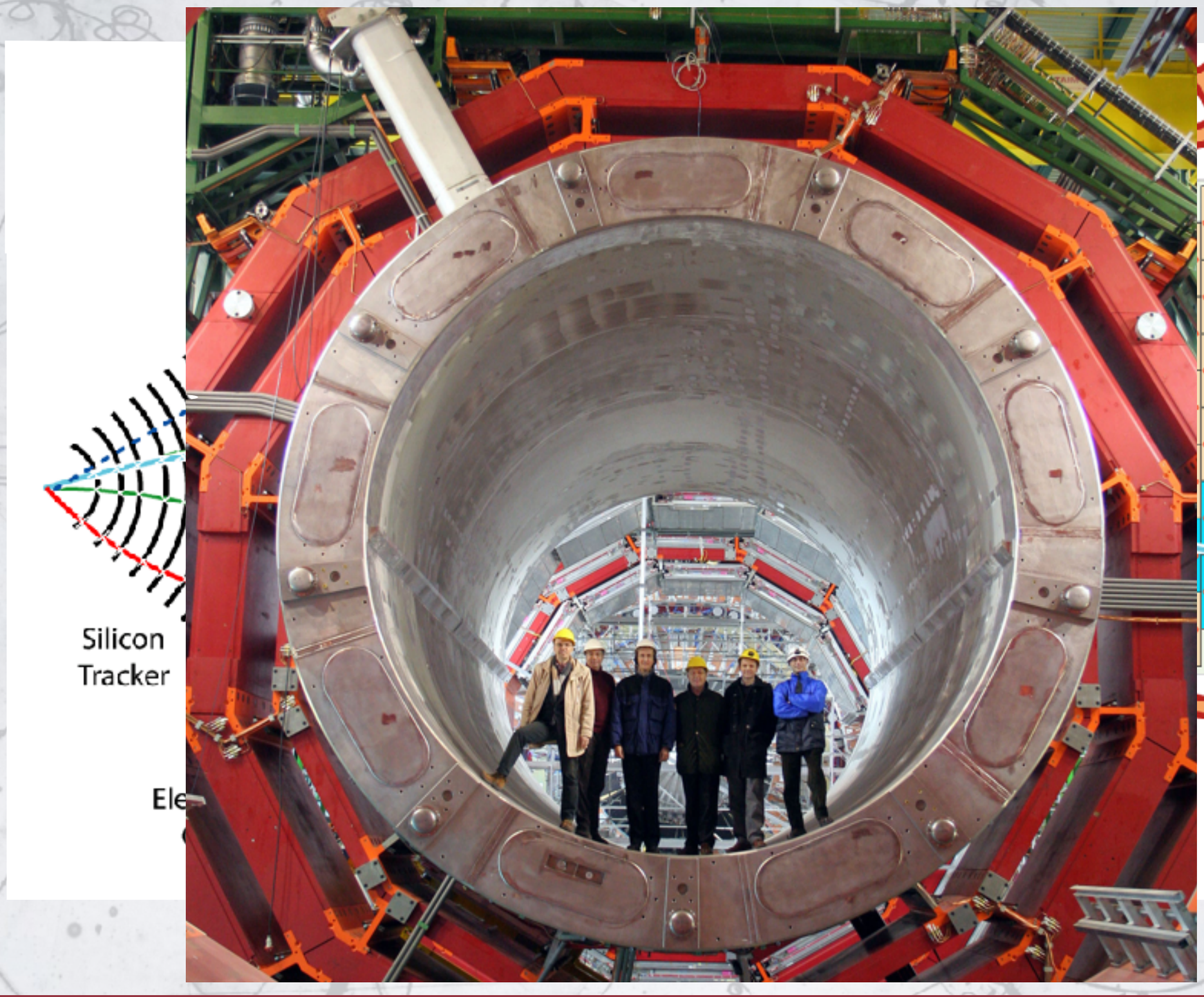

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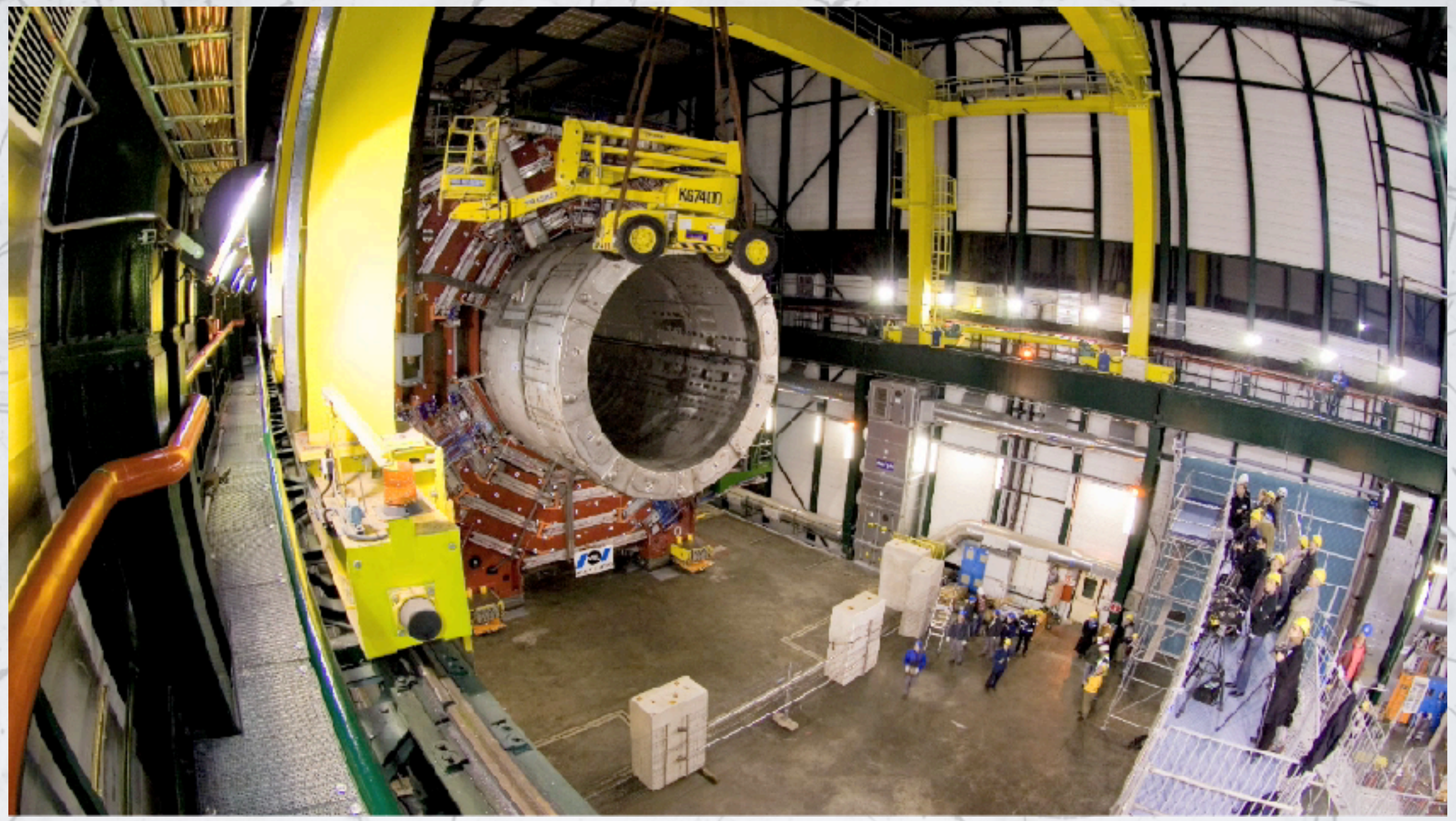

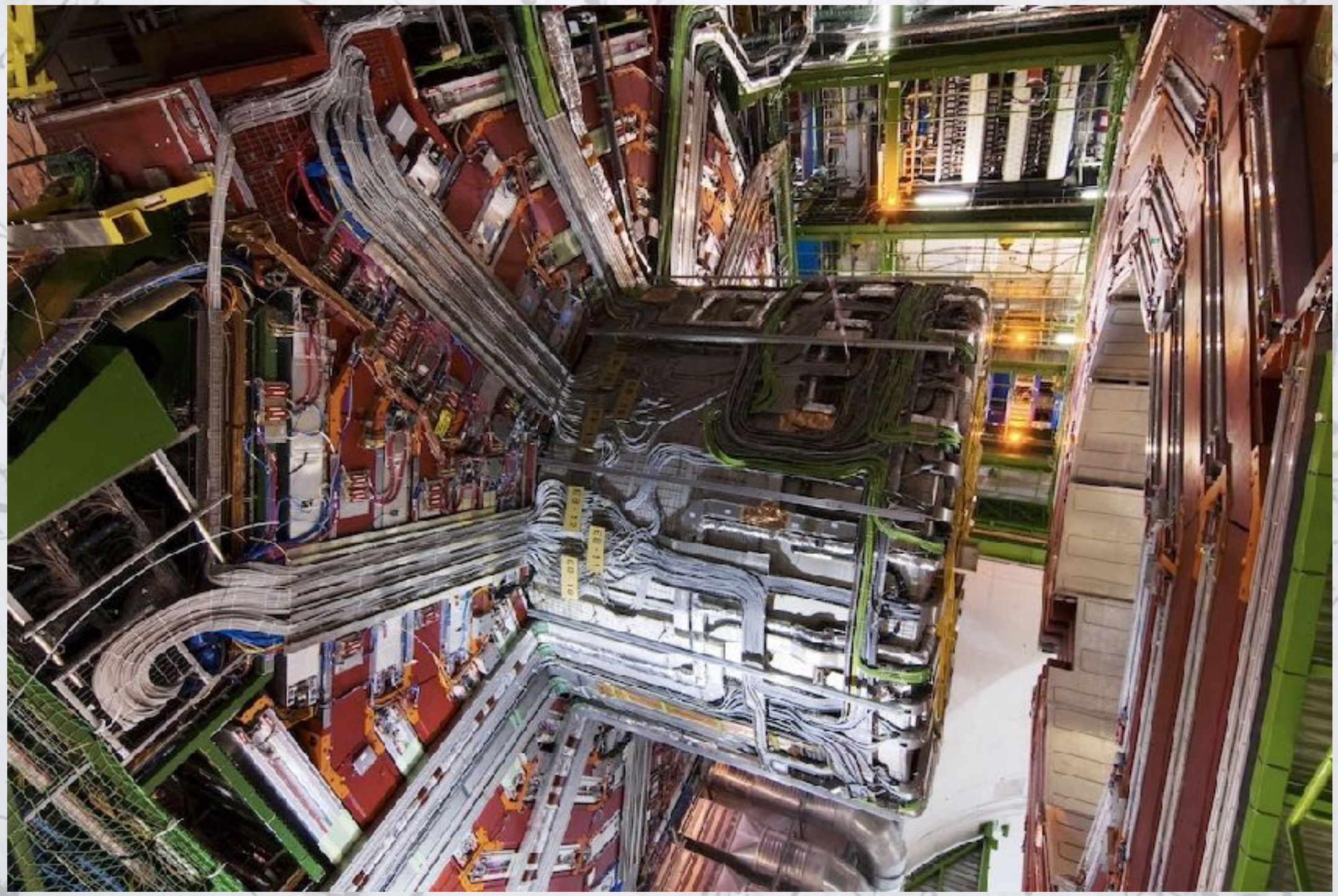

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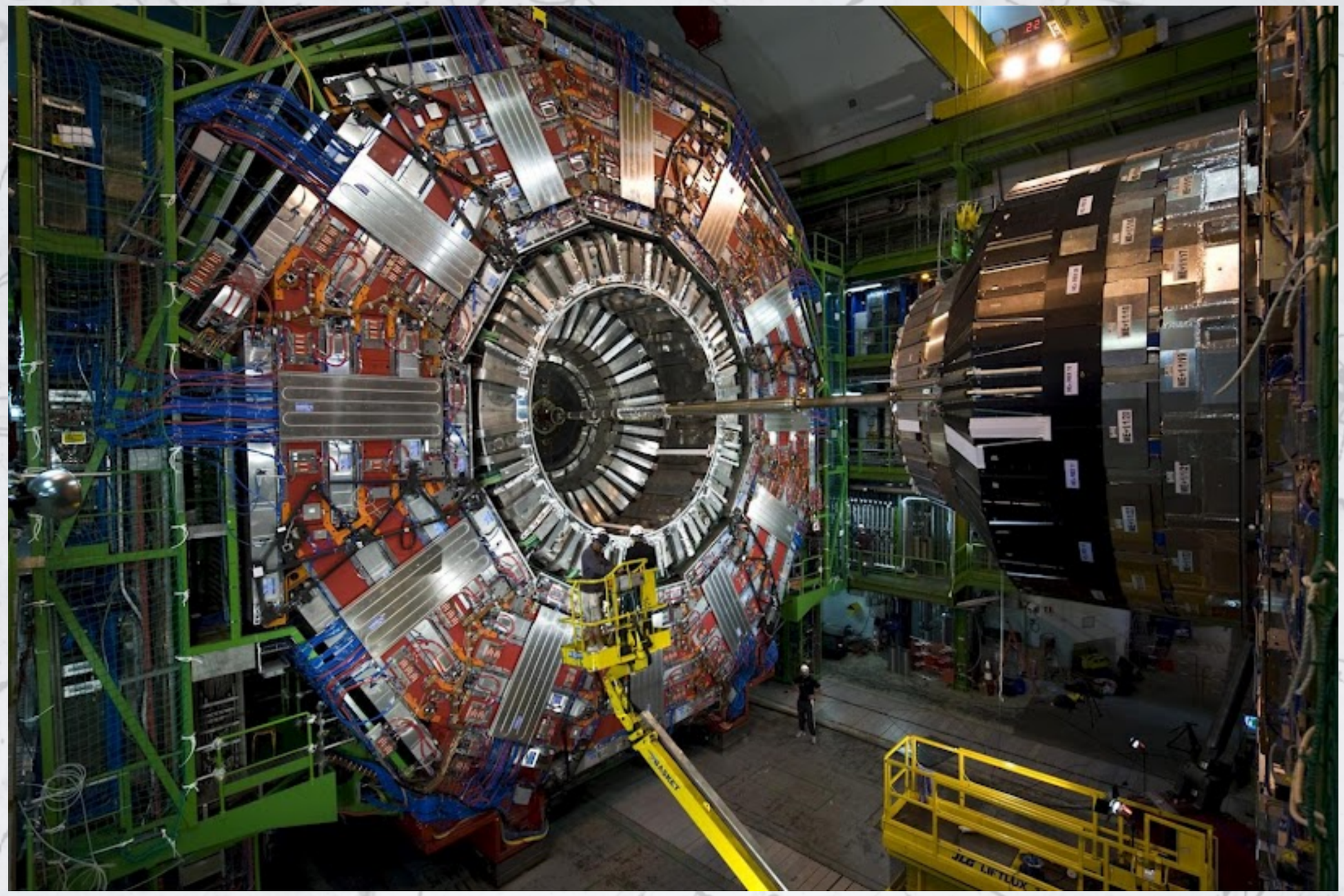
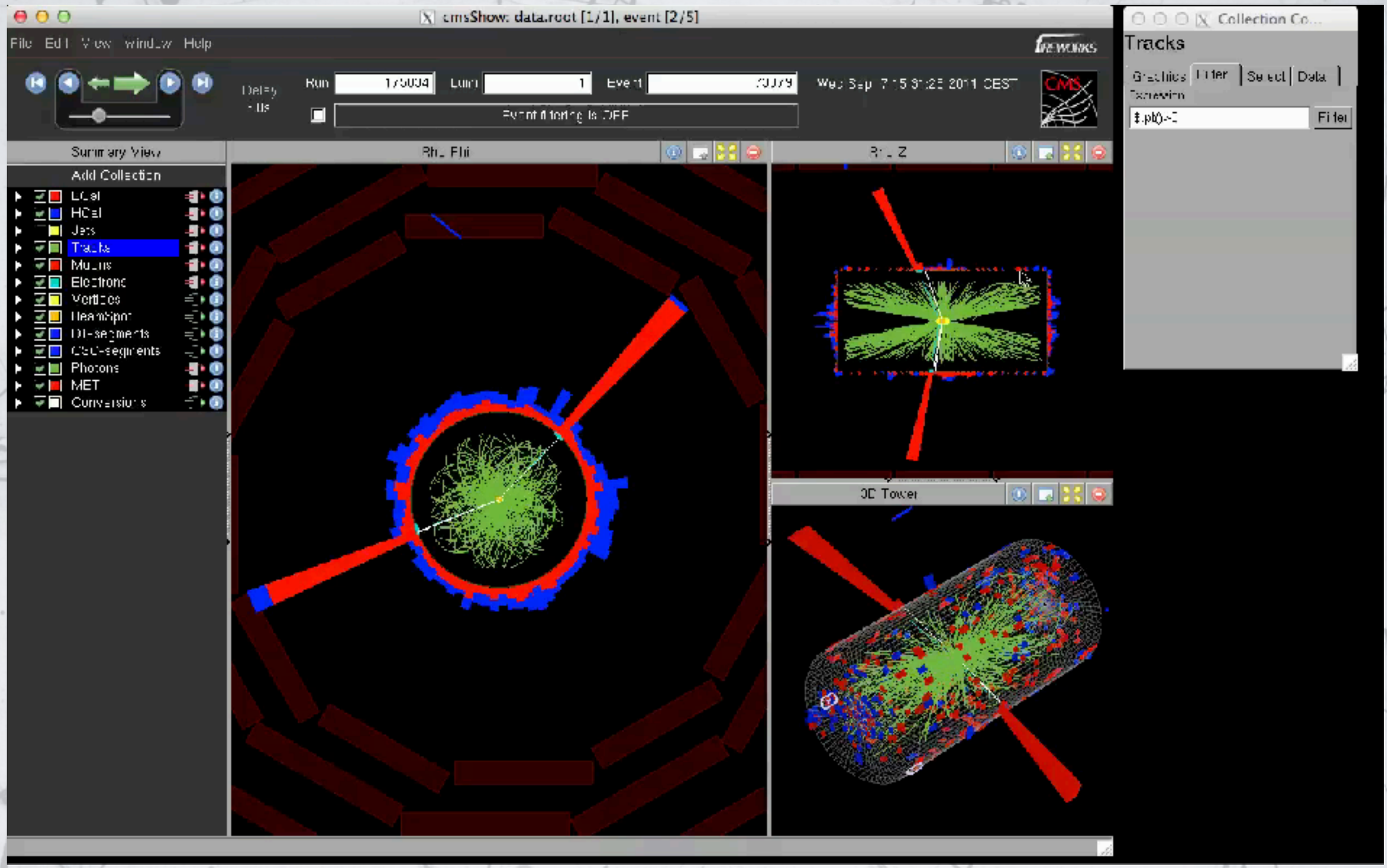
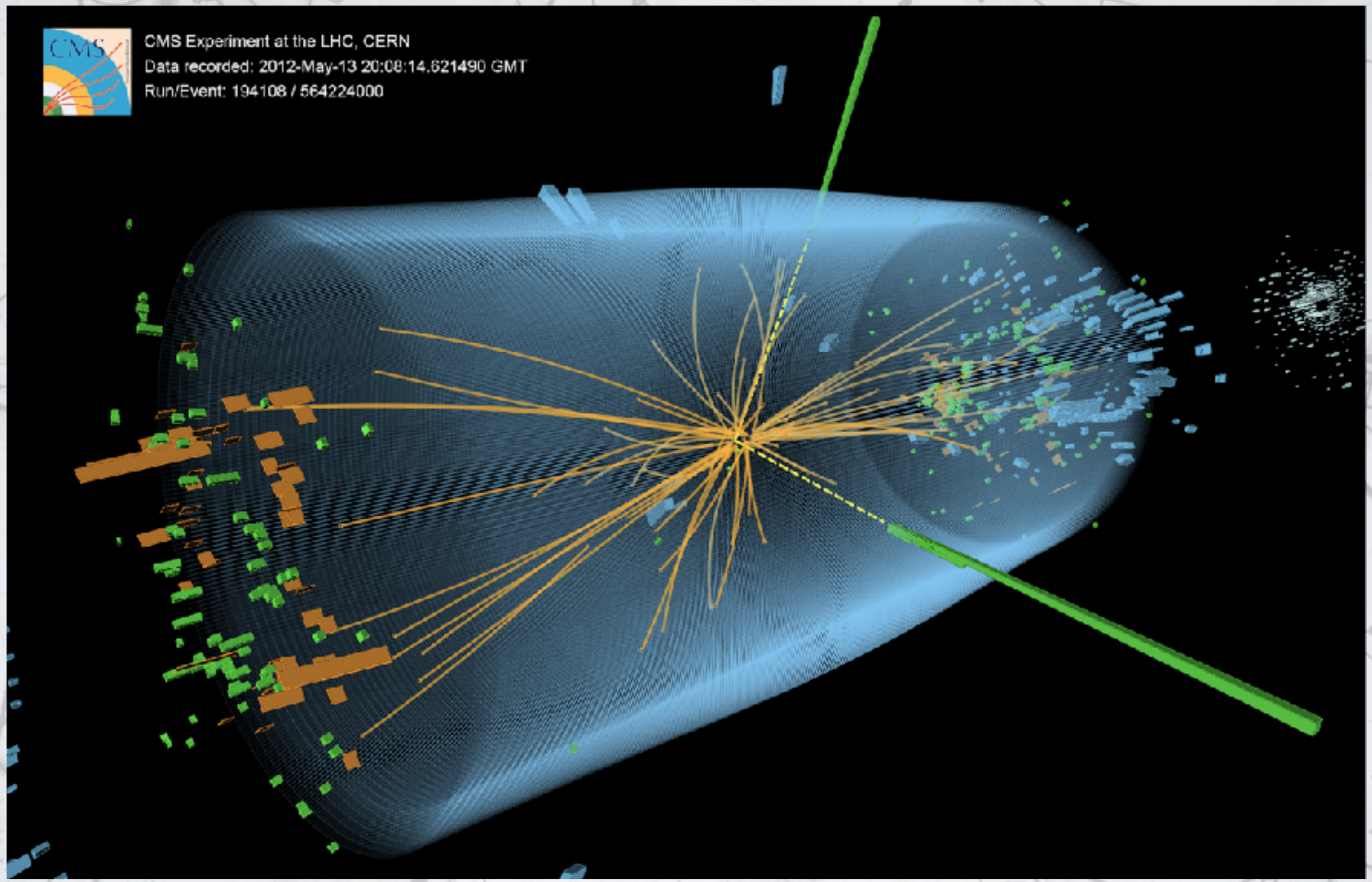

JLG LIFTLUX


cmsShow: data.root [1/1], event [2/5]
File Edit View Window Help
Run
Lumi
Event
Event filtering is OFF
Summary View
Add Collection
Tracks
Muons
Electrons
Vertices
Photons
MET
Rho Phi
Rho Z
3D Tower
Collection Co...
Tracks
Graphics
Filter
Select
Data
Filter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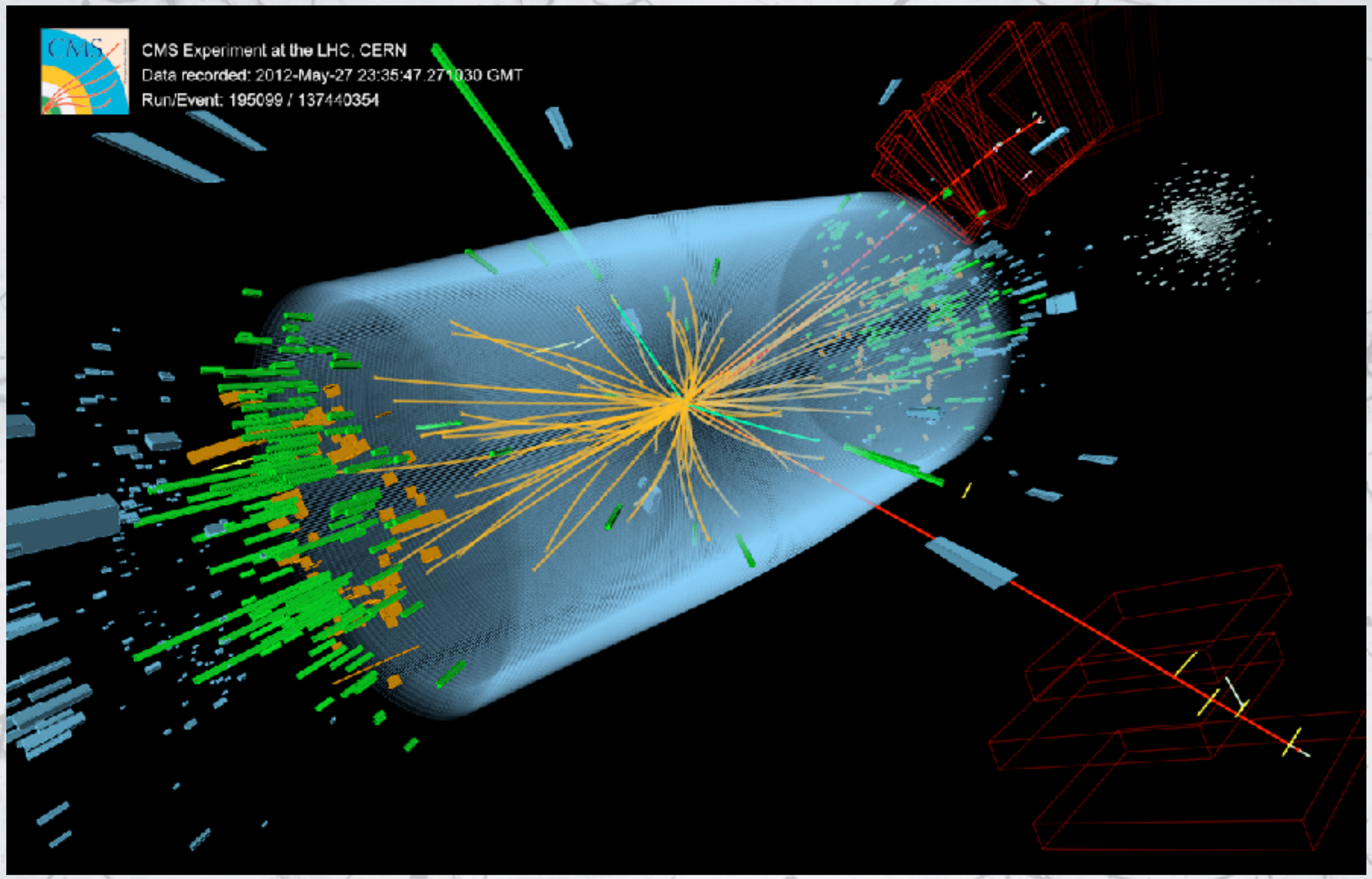
Run/Event: 194108 / 564224000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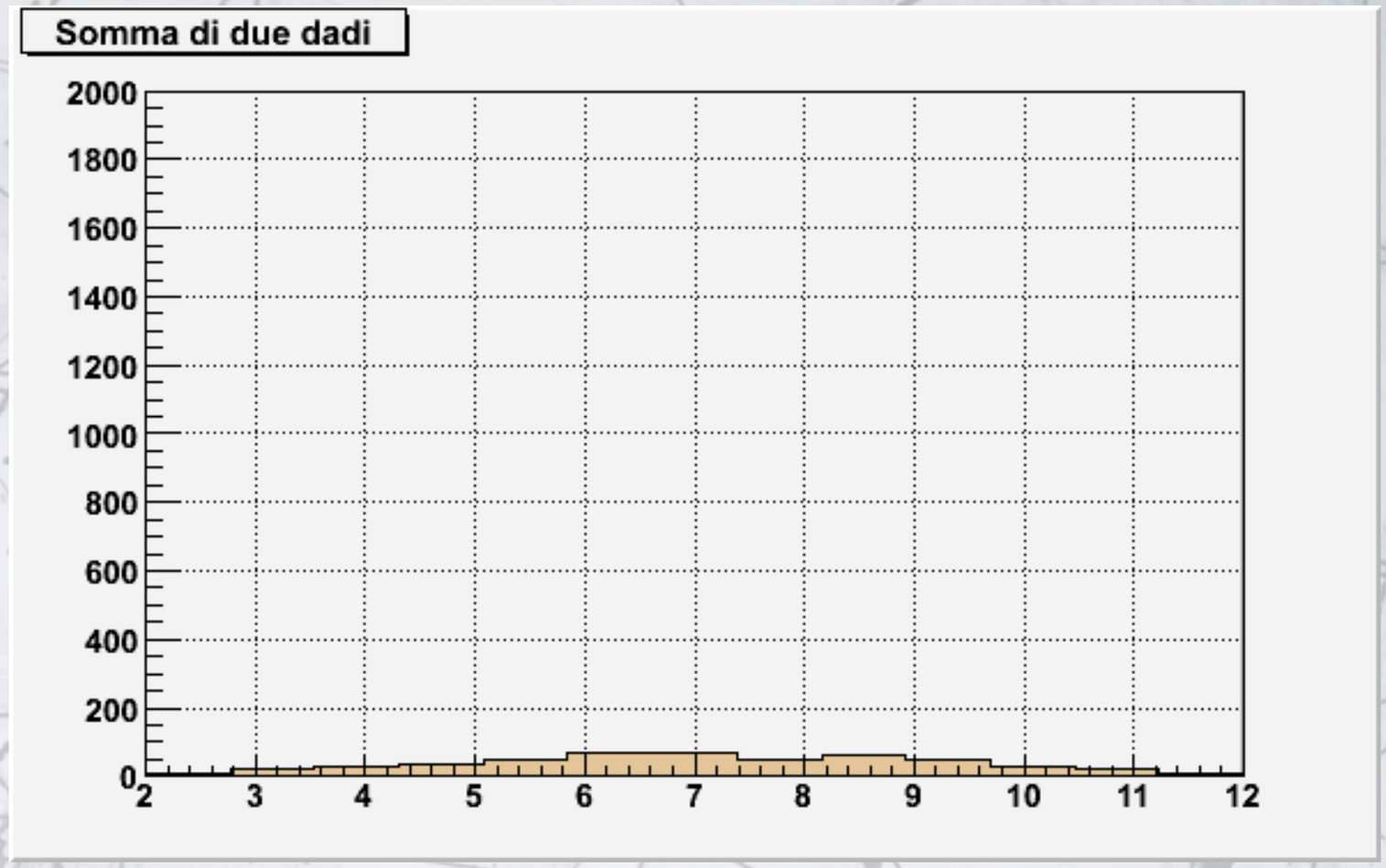
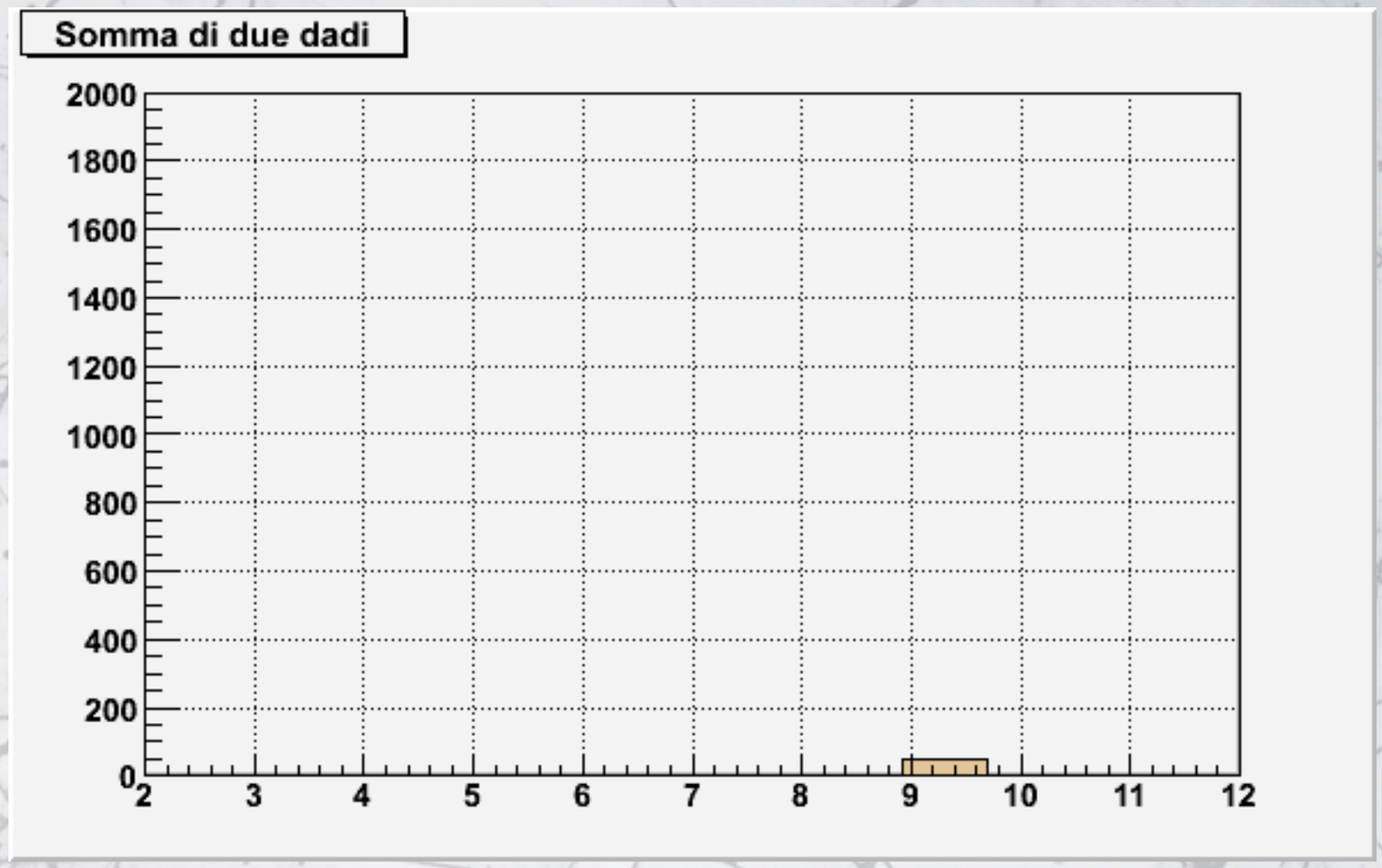
Run/Event: 195099 / 137440354


Somma di due dadi
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2
3
4
5
6
7
8
9
10
11
12


Somma di due dadi
2000
1800
1600
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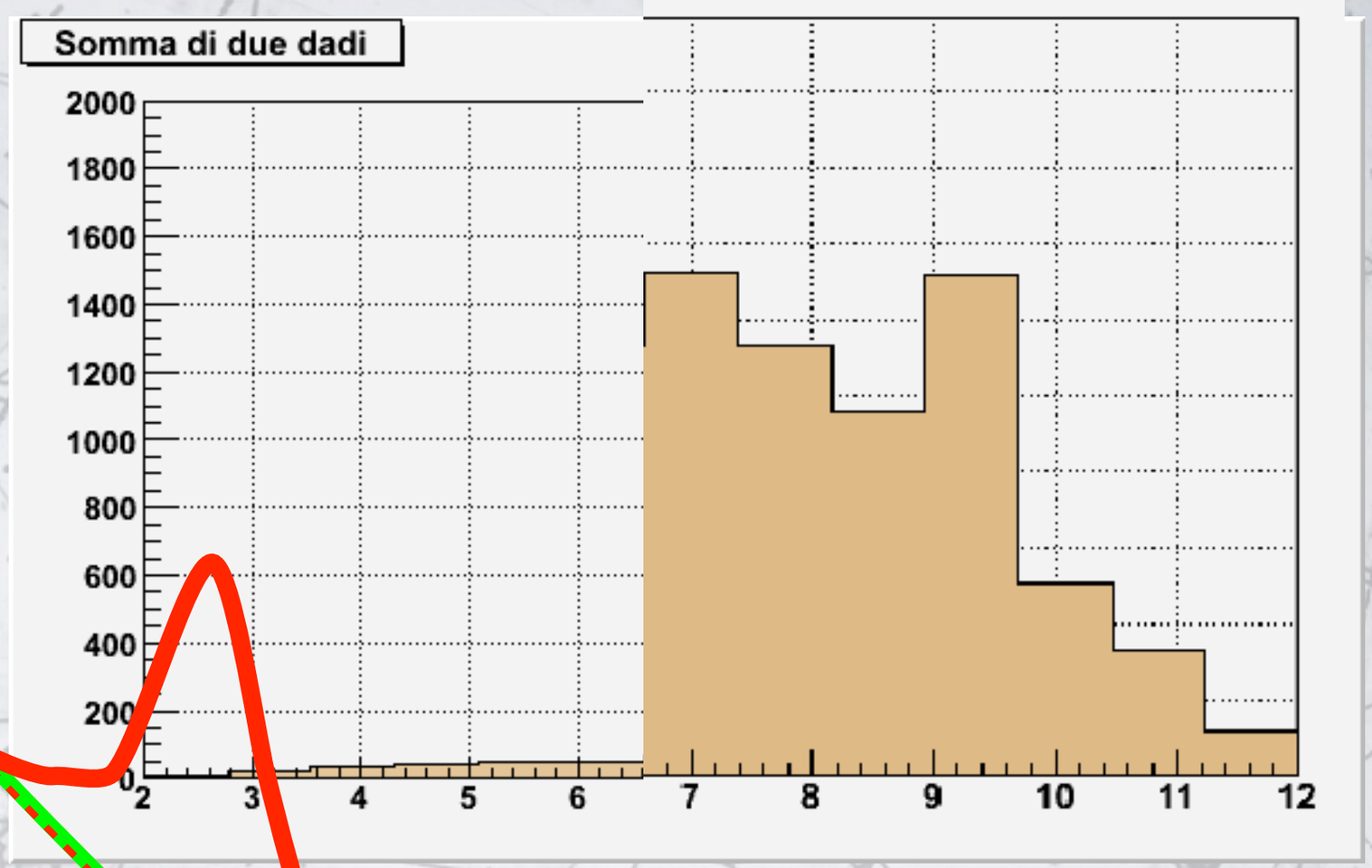
Somma di due dadi
2000
1800
1600
1400
1200
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200
0
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10
11
12

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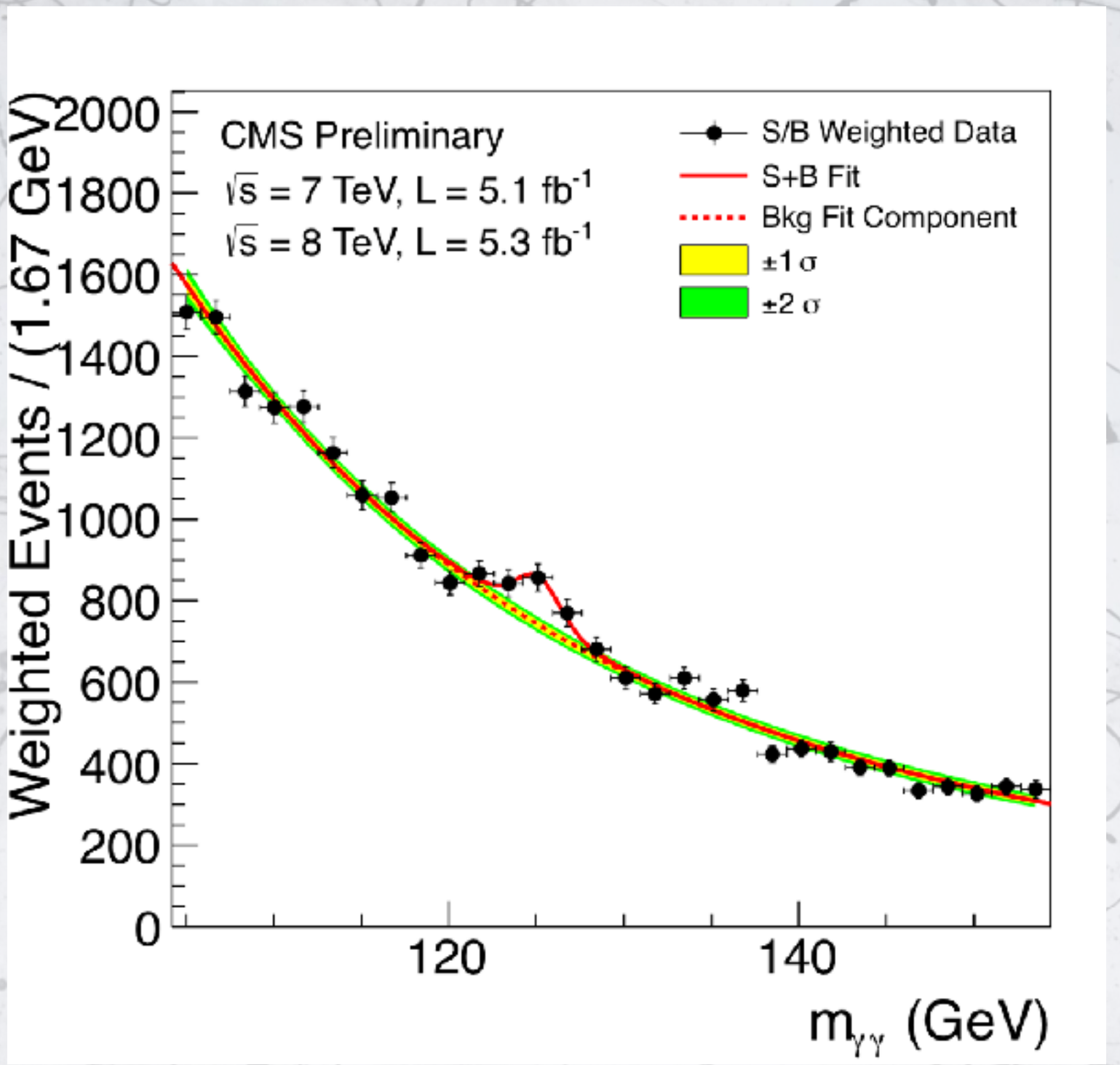
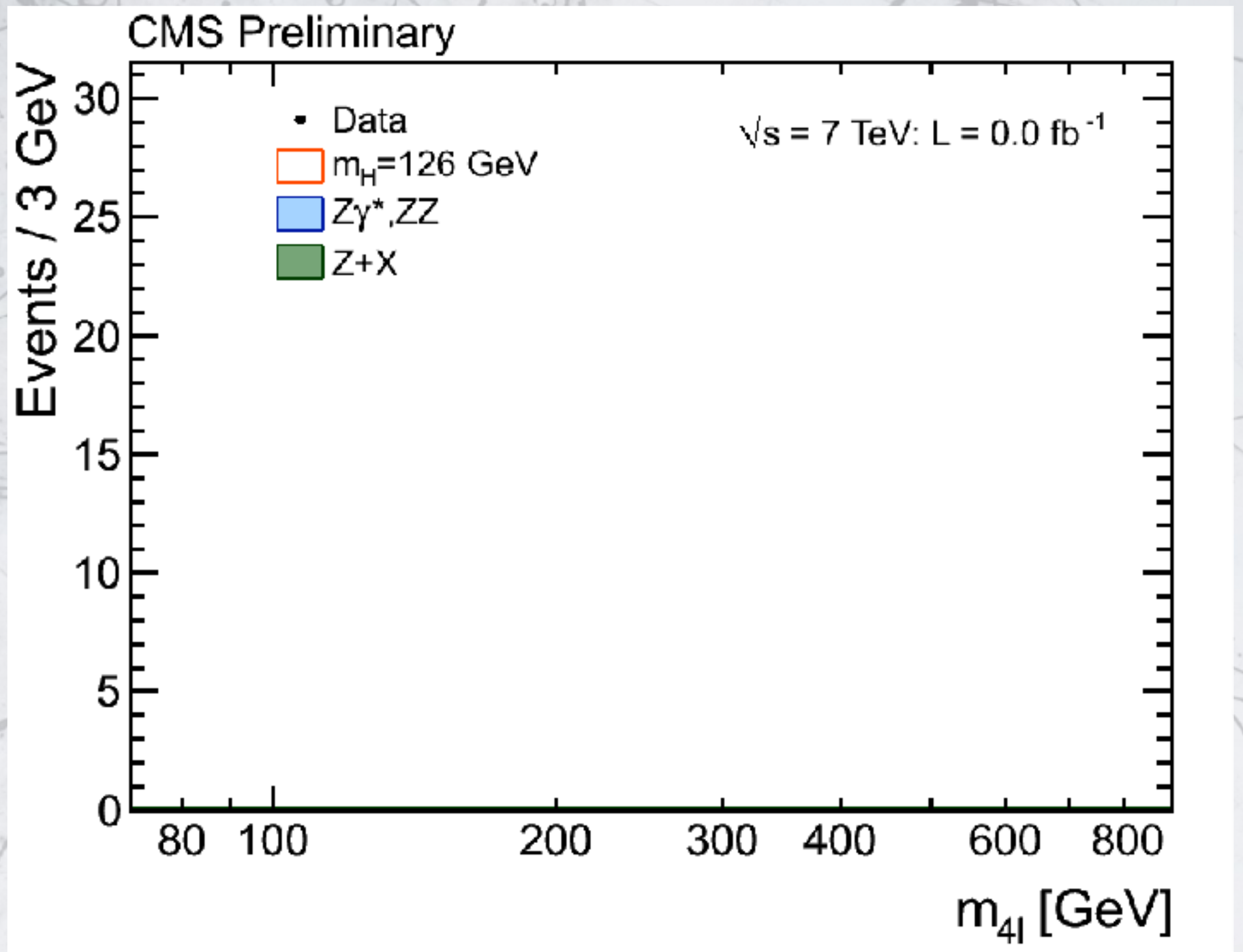
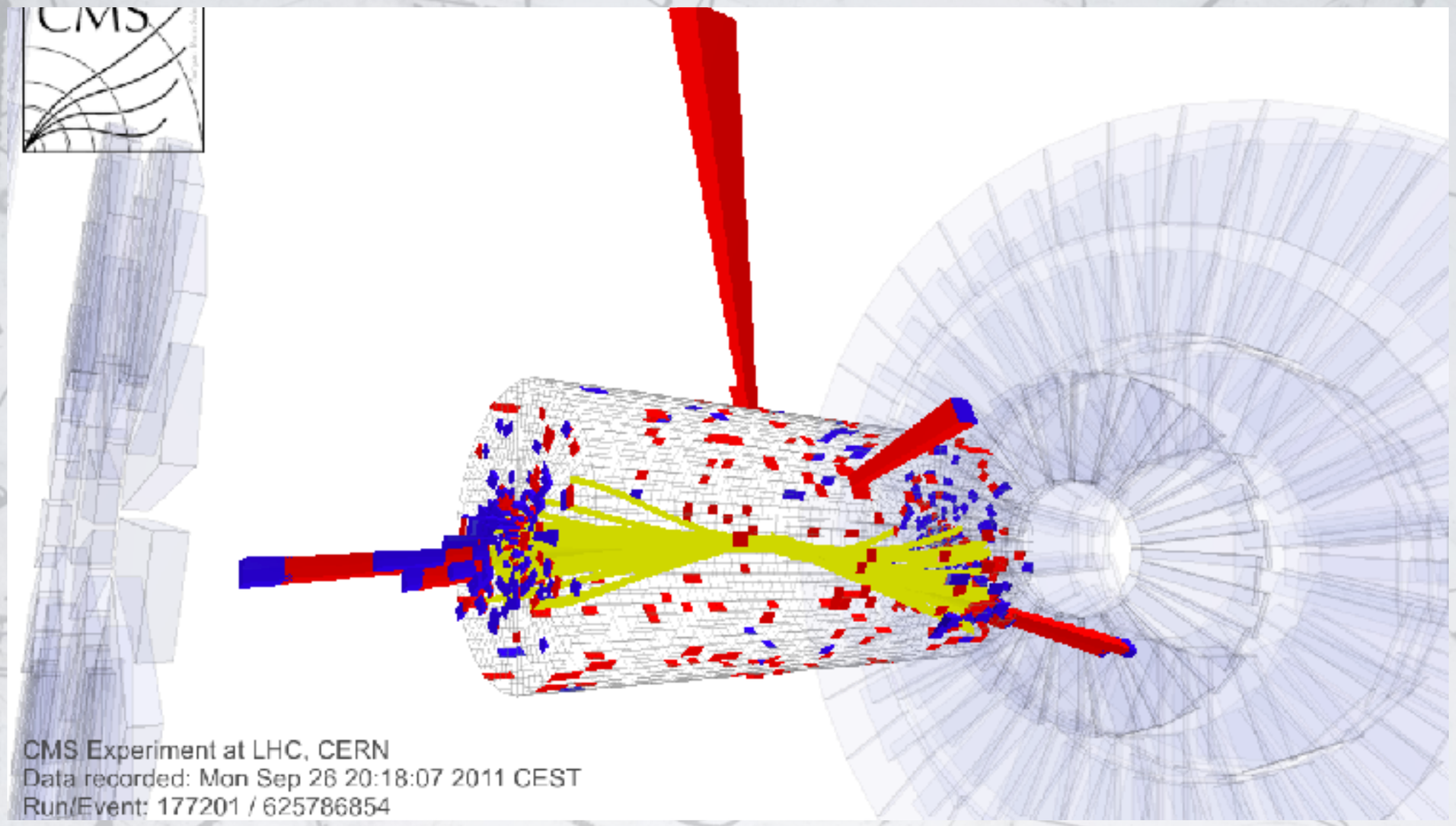



CMS Preliminary
Events / 3 GeV
30
25
20
15
10
5
0
Data
m_H=126 GeV
Zγ*,ZZ
Z+X
√s = 7 TeV: L = 0.0 fb^{-1}
80
100
200
300
400
600
800
m_{4l} [GeV]



CERCARE L'AGO NEL PAGLIAIO

40 milioni di collisioni/s
20 urti pp per collisione
200 giorni/anno

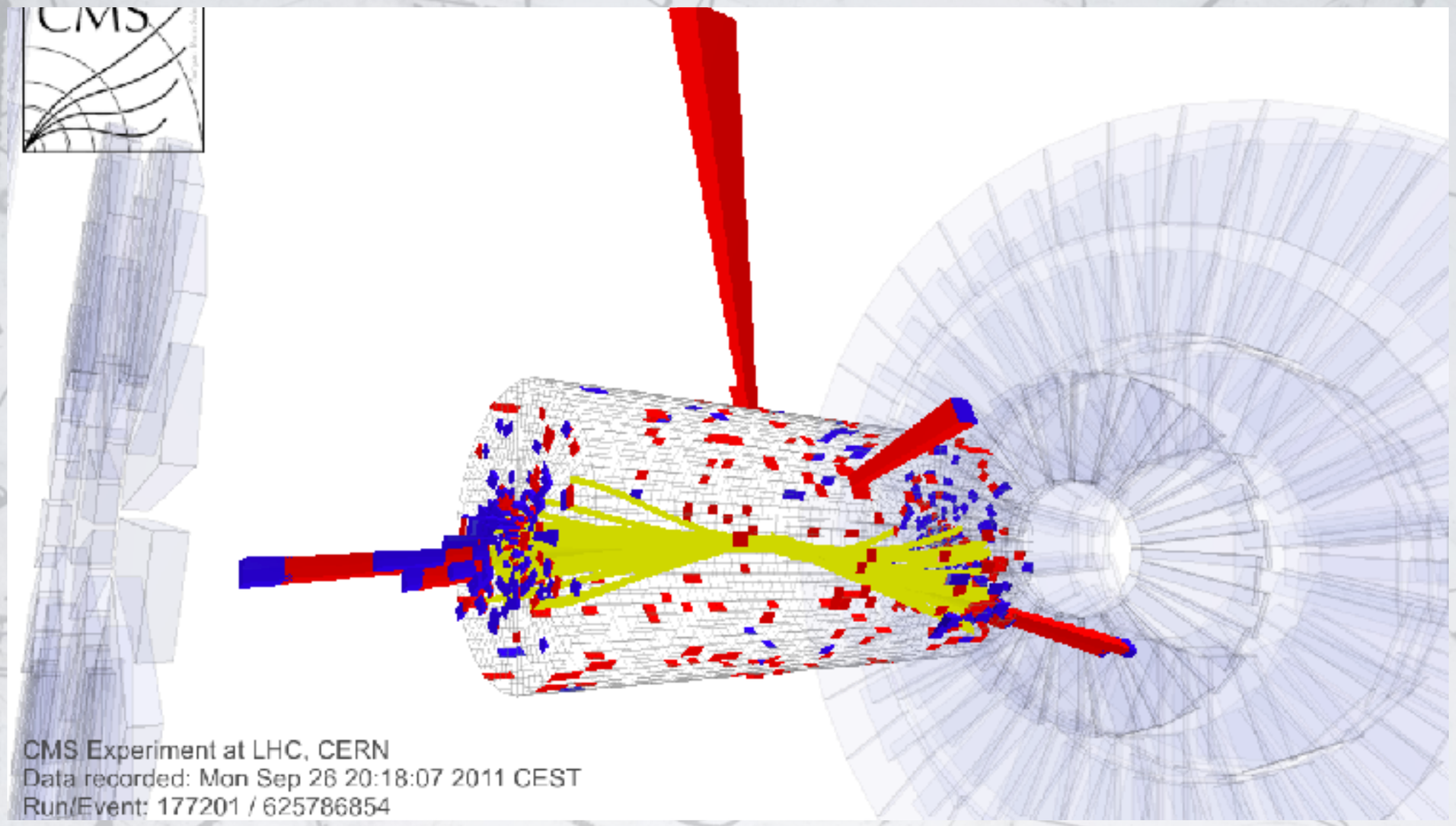
14 milioni di miliardi di eventi/anno
5 miliardi di eventi/anno selez.

400 $H \rightarrow \gamma\gamma$

THE GRID

CONCLUSIONE

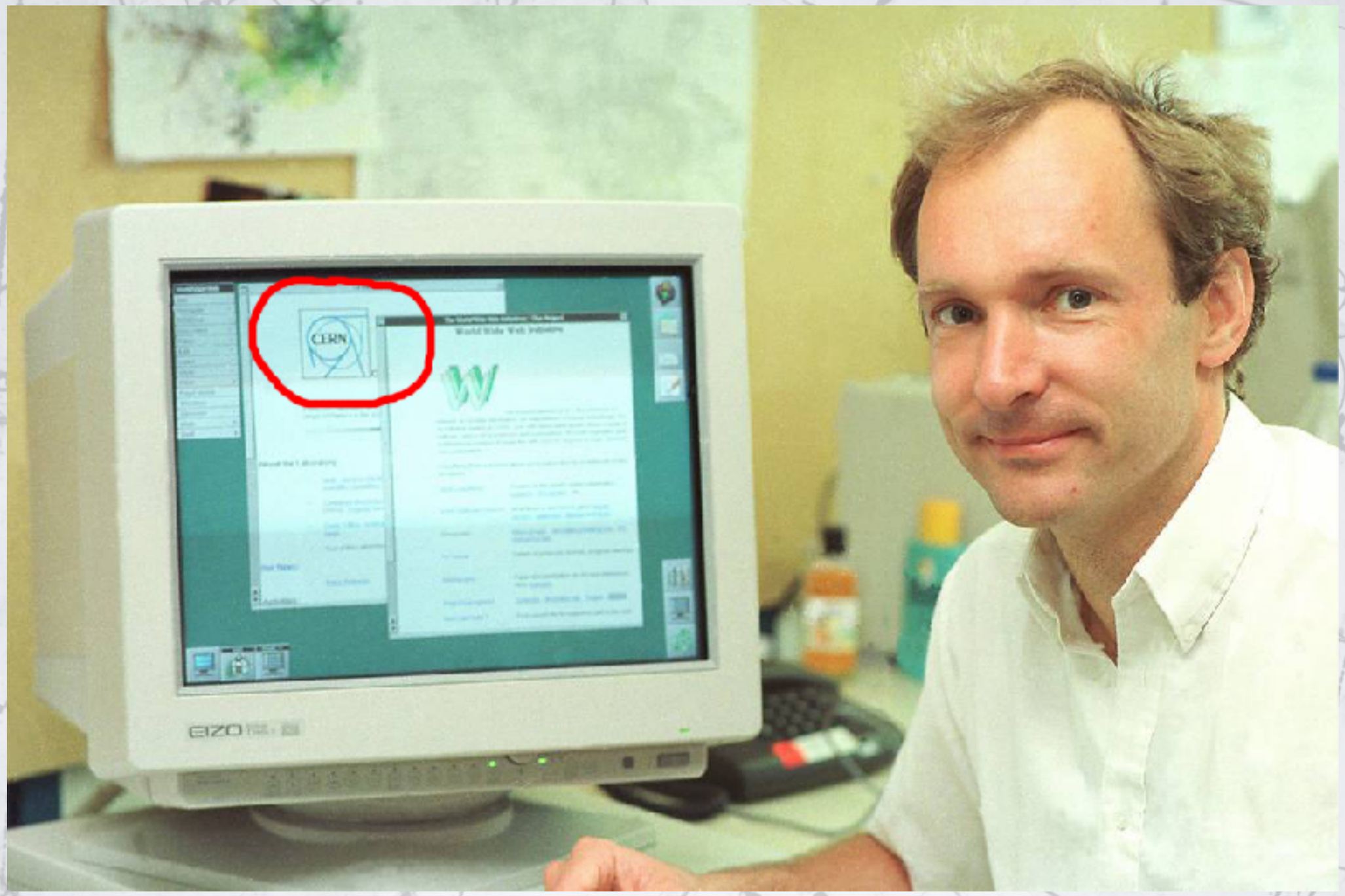
CONCLUSIONE



MA A CHE SERVE?

EFFETTI COLLATERALI

EFFETTI COLLATERALI



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CLOUD.it i nuovi ed innovativi servizi che rivoluzionano il mondo IT

Scegliere e gestire ovunque ti trovi ed in libertà i servizi creati da te, ottimizzare le spese di esercizio, ridurre i costi di start up, aumentare la sicurezza dei dati: rappresentano solo alcuni dei vantaggi dei servizi Cloud. IT che Aruba presenta a tutti i clienti. Se i tuoi obiettivi sono flessibilità, ridondanza, abbattimento degli sprechi, centra il bersaglio con Aruba ed i servizi Cloud.IT. **Scopri subito tutte le caratteristiche dei servizi Cloud.IT!**

Cloud Computing Come funziona?

Hardware come servizio

Aruba **Cloud Computing** è un sistema IAAS (Infrastructure as a Service) che permette di creare una o più macchine virtual, utilizzandole e pagandole come se fossero servizi

Aruba Cloud Computing è una soluzione assolutamente **sicura**, totalmente **scalabile**, **veloce** e **personalizzabile** in funzione delle tue reali esigenze

Progetta e gestisci il tuo Datacenter con Aruba Cloud Computing!

Caratteristiche »

Acquista subito

Richiedi una prova

Cloud Applications

Cloud Applications consente di utilizzare in modalità managed le applicazioni web maggiormente impiegate e diffuse (wordpress, joomla, etc..) liberandoti da operazioni di installazione e manutenzione.

Di tutto questo infatti si occuperà Aruba, consentendoti così di dedicarti completamente alla tua attività.

Cloud Storage

I Servizi di Cloud Storage estendono l'approccio flessibile e dinamico anche al mondo dello storage dei dati e del backup.

Cloud Object Storage
Ideale per coloro che intendono sviluppare applicazioni che necessitano di storage on-line

Cloud Back-up
Per l'organizzazione di sistemi di

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