

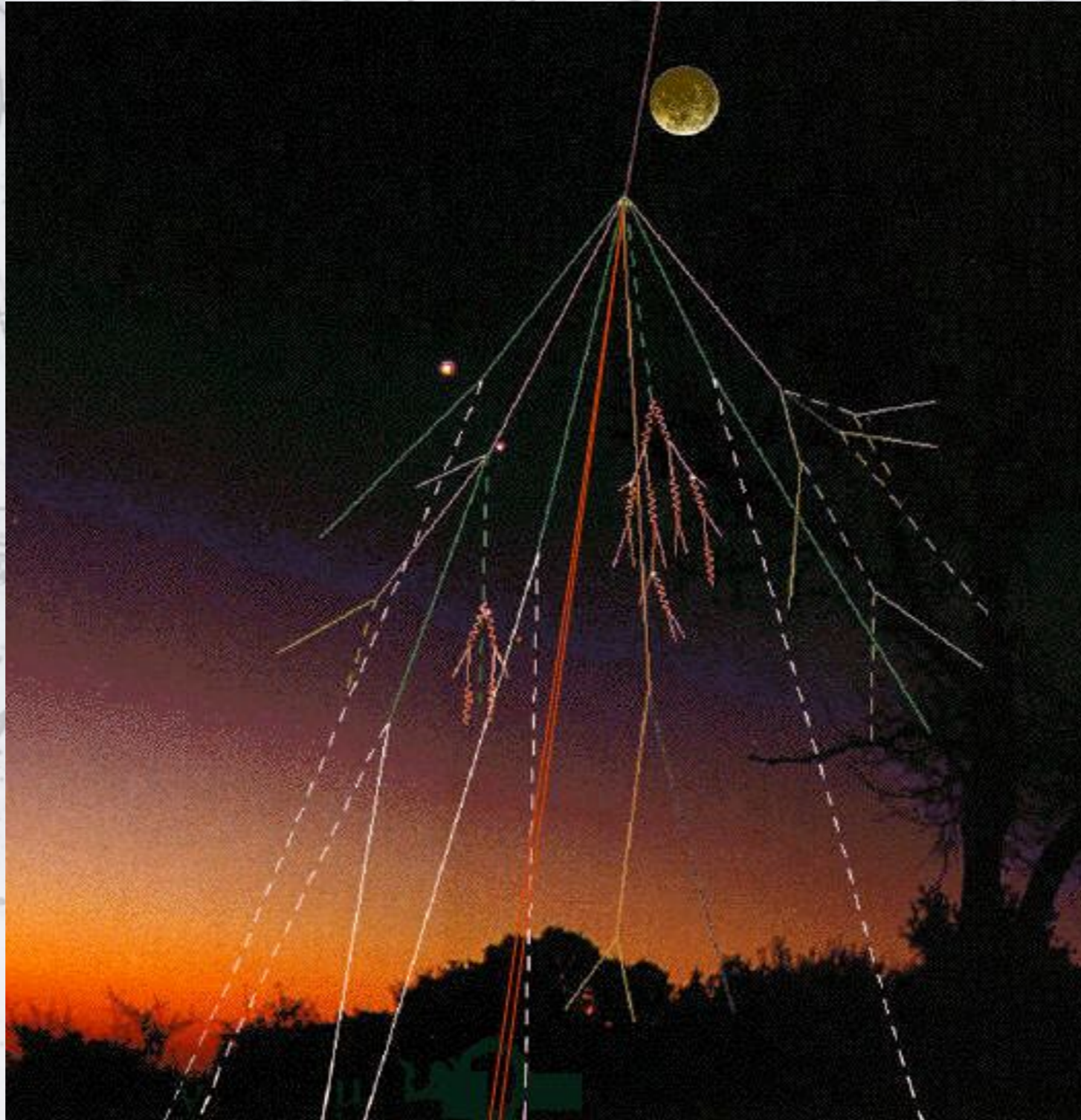
# ACCELERATORI E RIVELATORI

Giovanni Organtini

“Sapienza” Università di Roma & INFN-Sez. di Roma



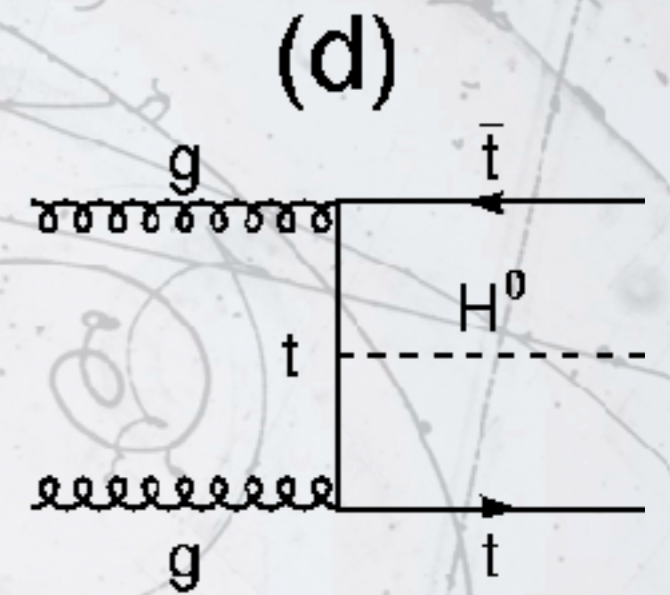
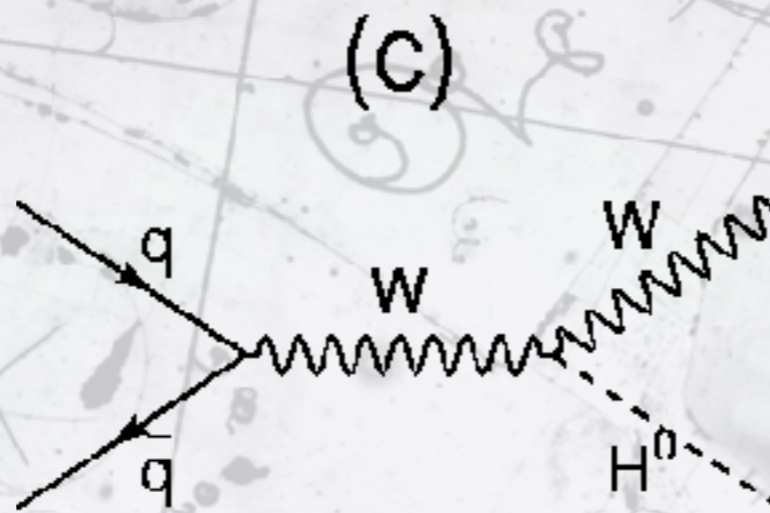
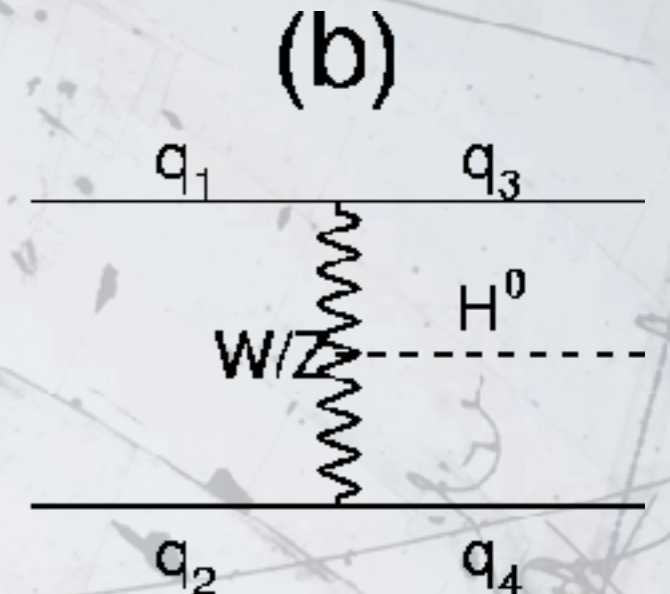
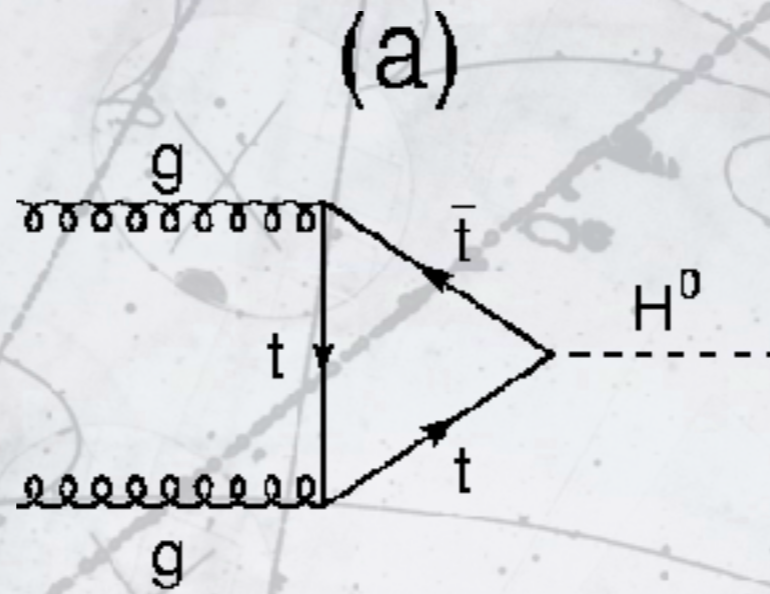
# DAI RAGGI COSMICI AGLI ACCELERATORI



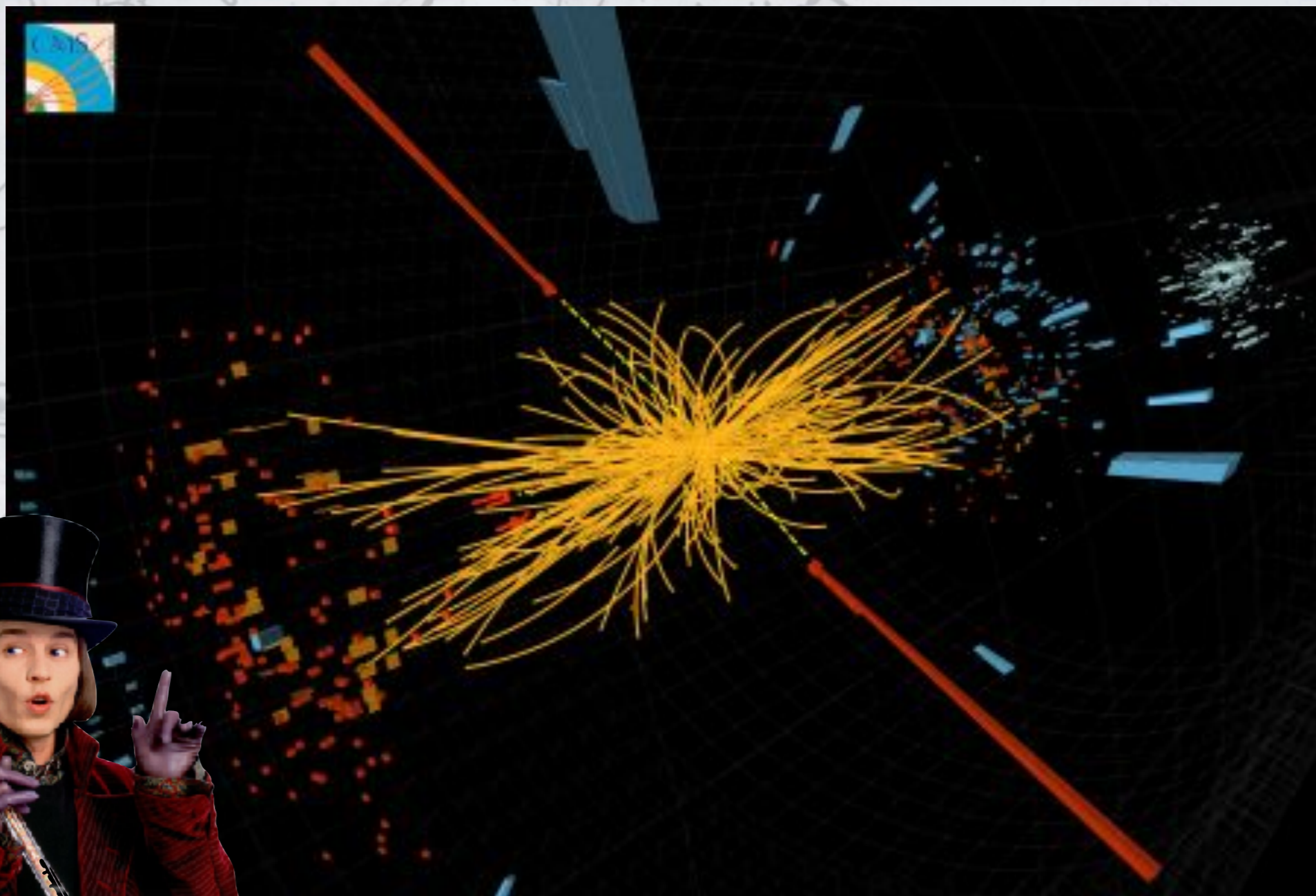




# RICETTE PER UN BOSONE DI HIGGS



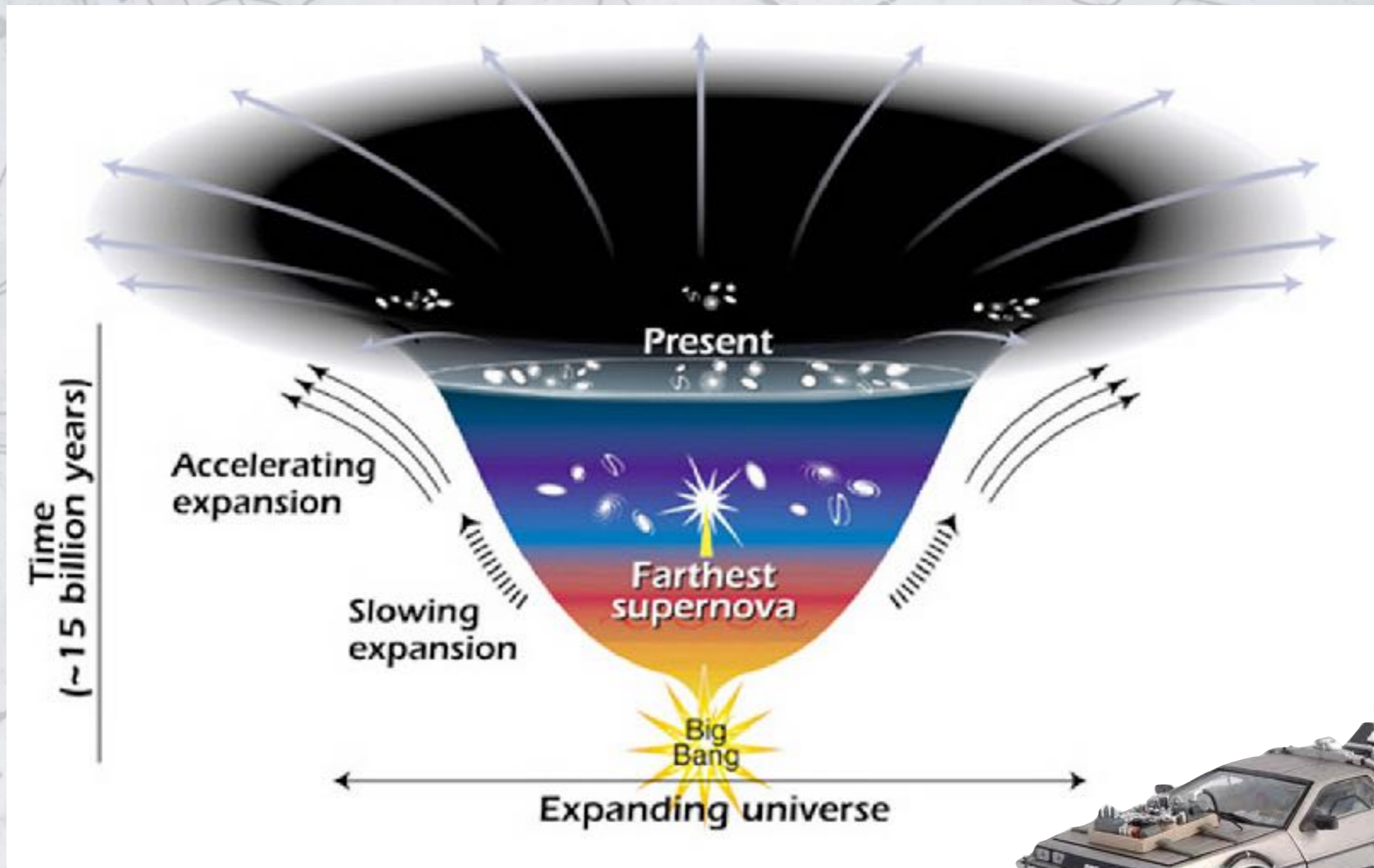
# LA FABBRICA DI PARTICELLE





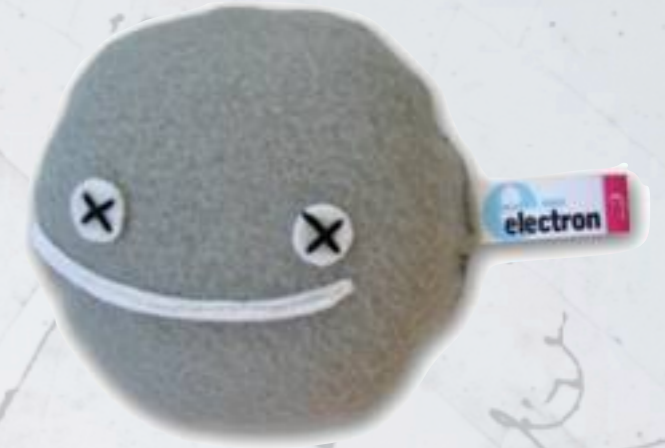


# LA MACCHINA DEL TEMPO



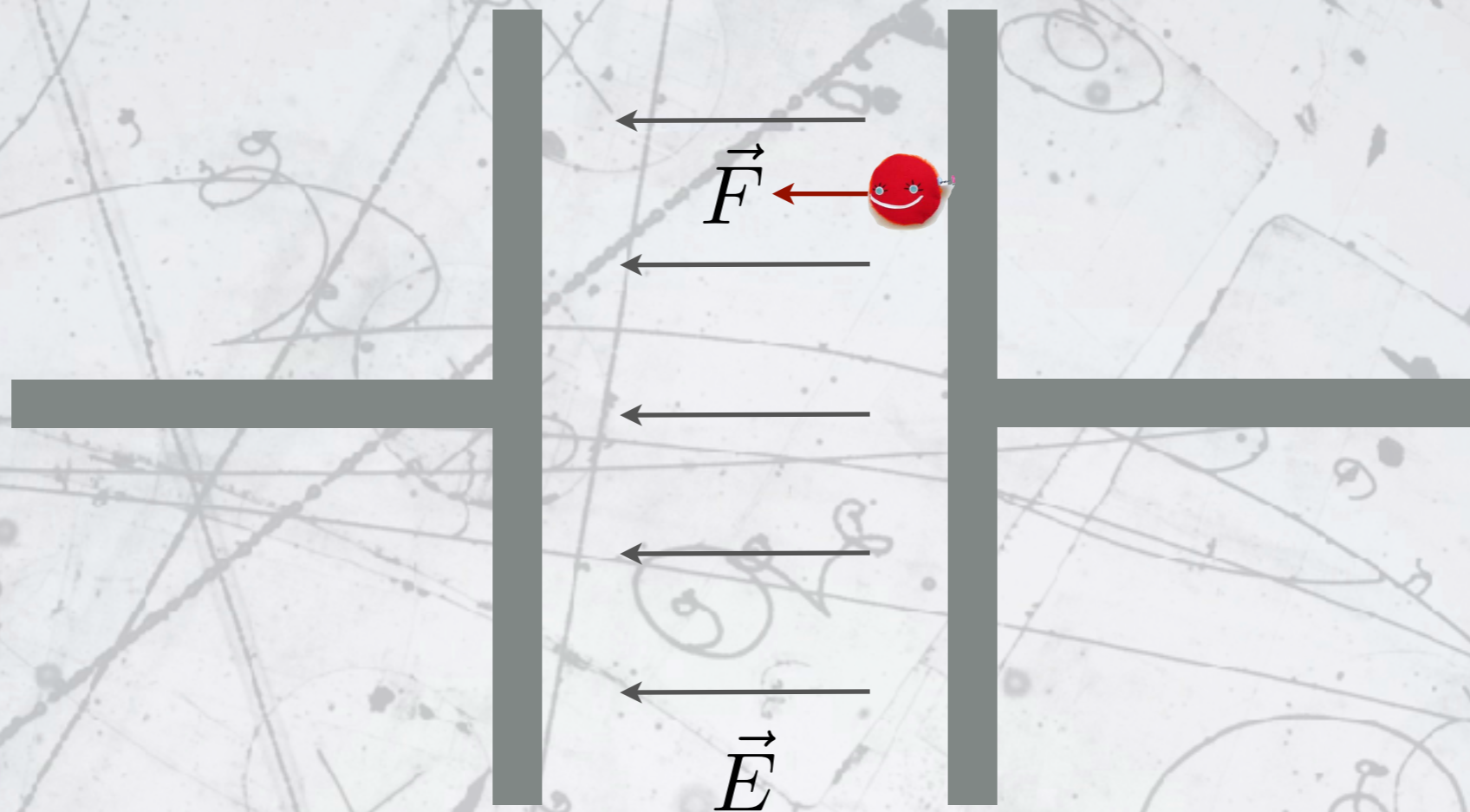


# LE PARTICELLE

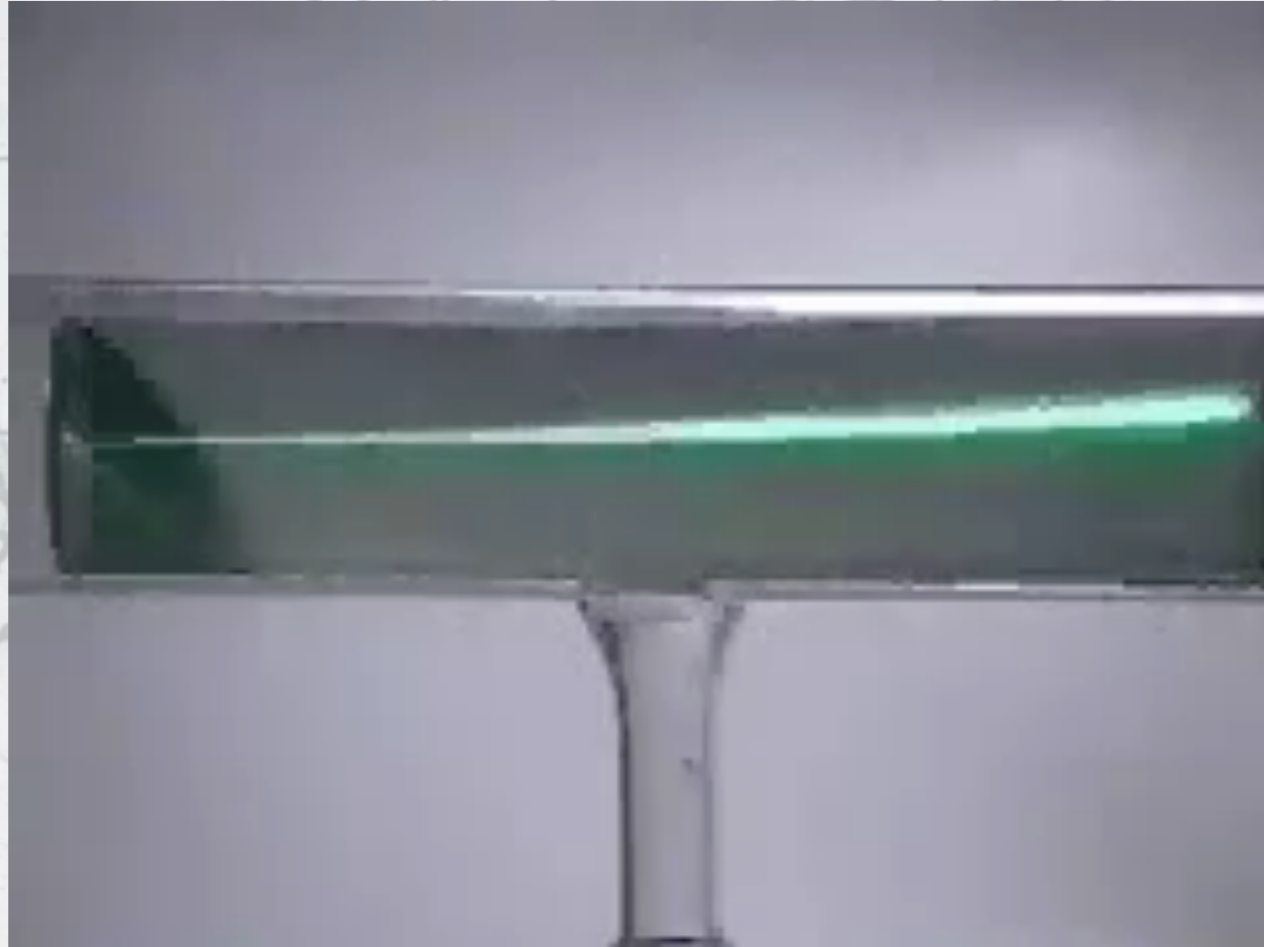


$$\vec{F} = q \left( \vec{E} + \vec{v} \times \vec{B} \right)$$

# ACCELERAZIONE

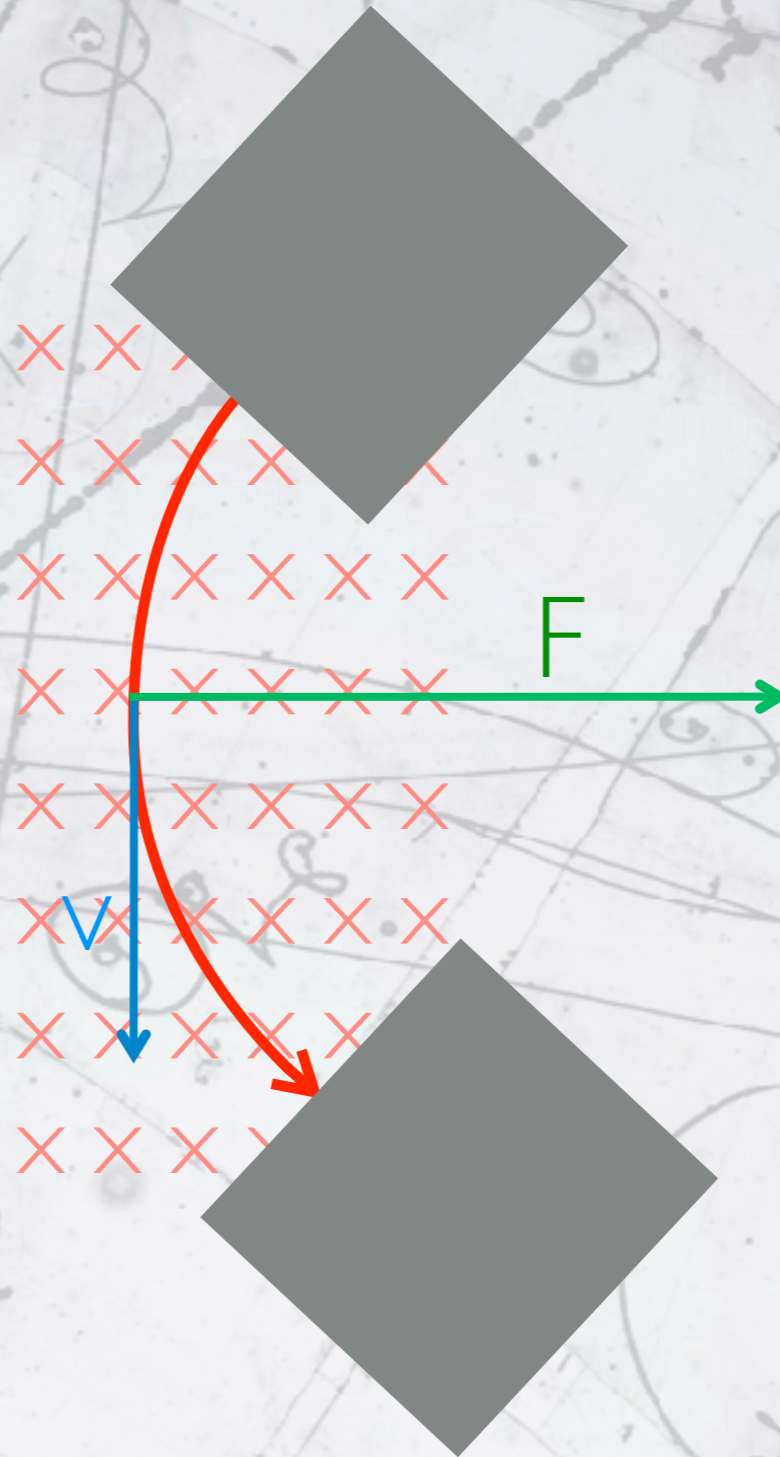


$$\vec{F} = m\vec{a} = q\vec{E}$$

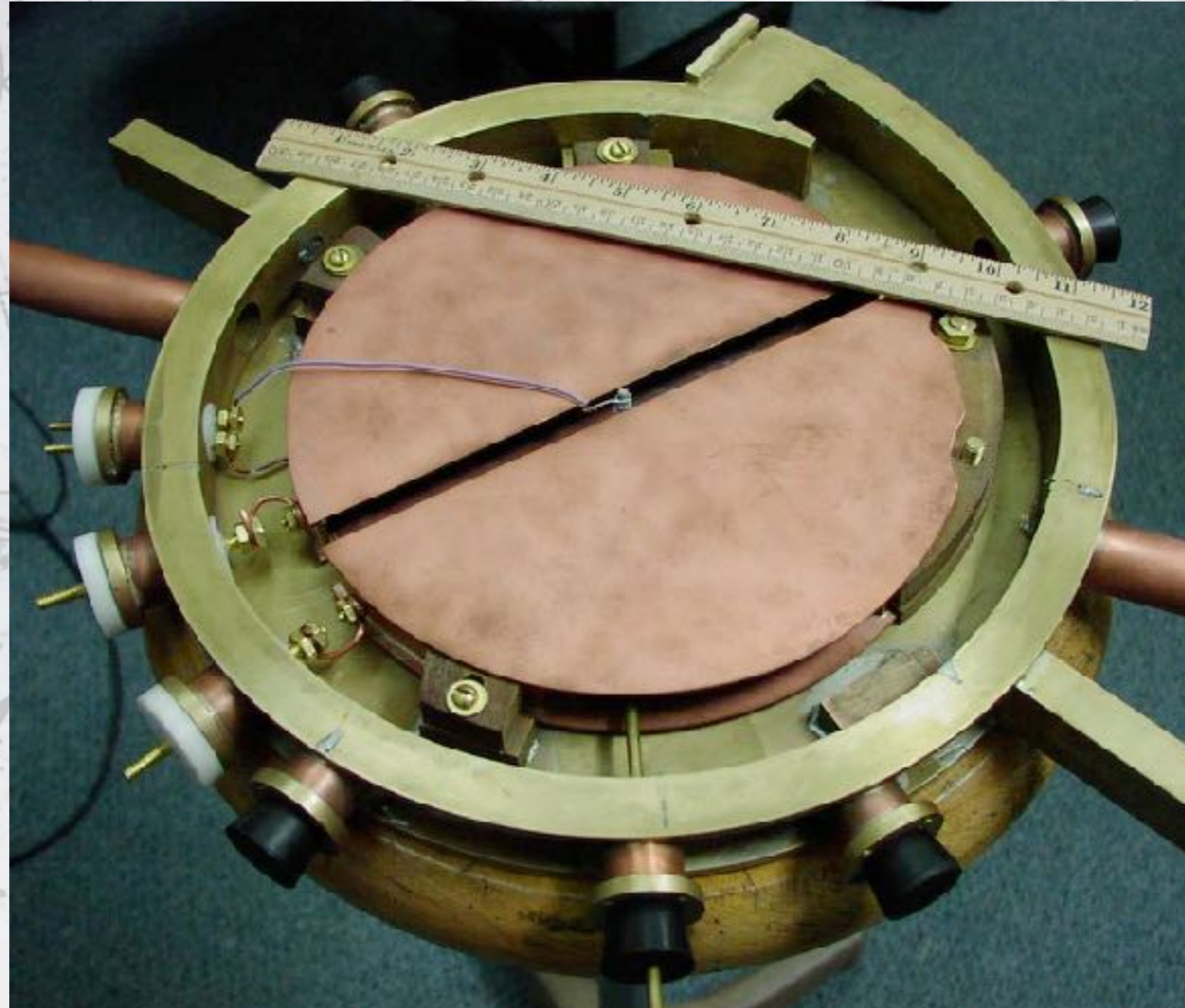


# GUIDA

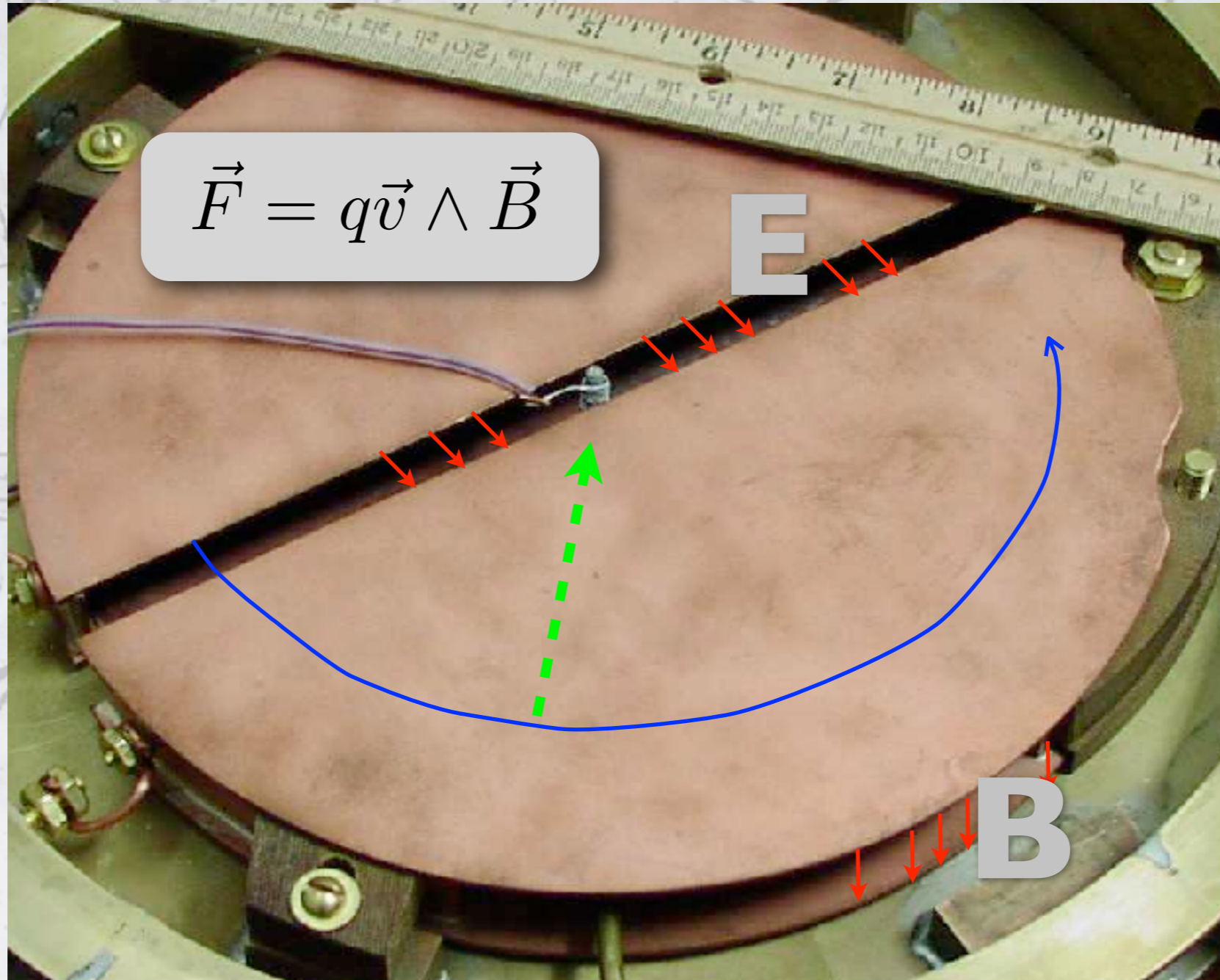
$$\vec{F} = q\vec{v} \wedge \vec{B}$$



# UN SEMPLICE ACCELERATORE:



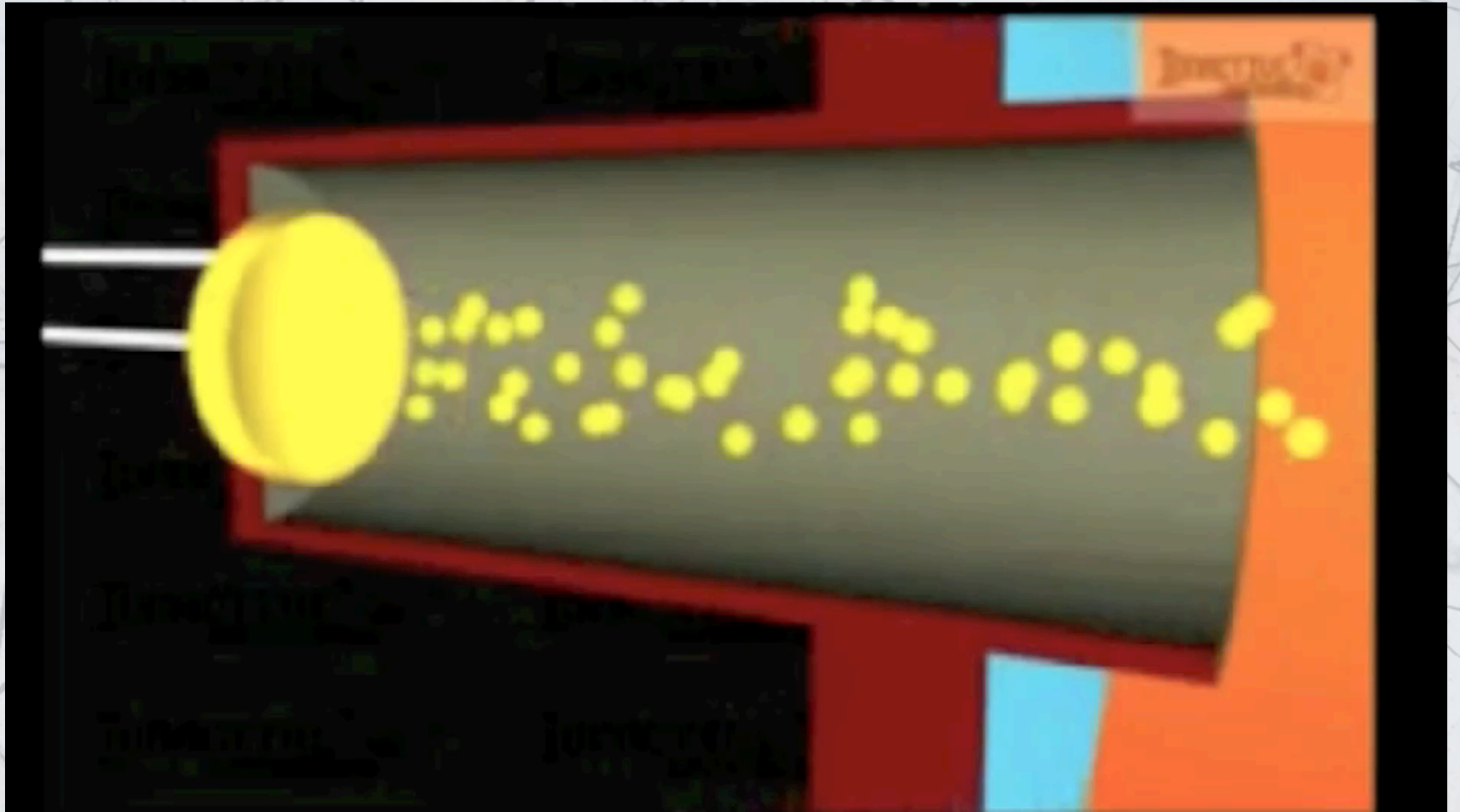
# UN SEMPLICE ACCELERATORE:



# ACCELERAZIONE



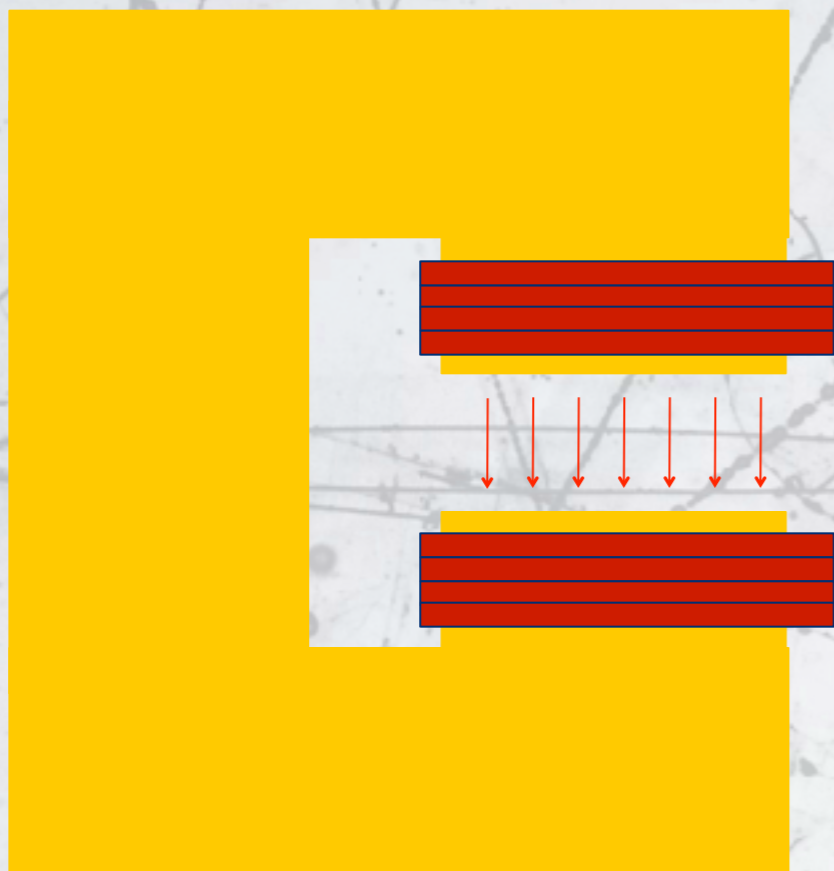
# GUIDE D'ONDA



# LE DIMENSIONI DI LHC

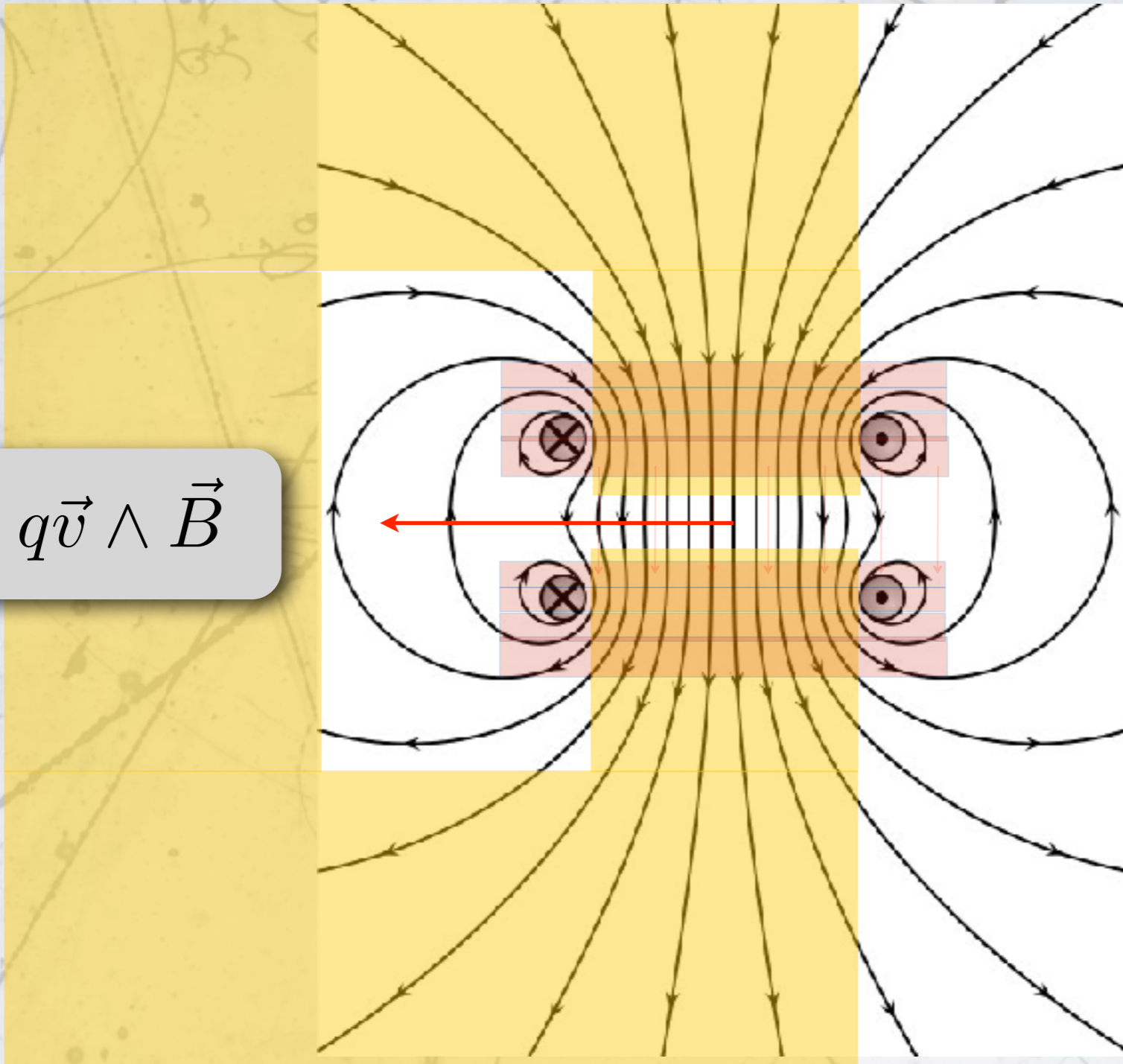


# GUIDA



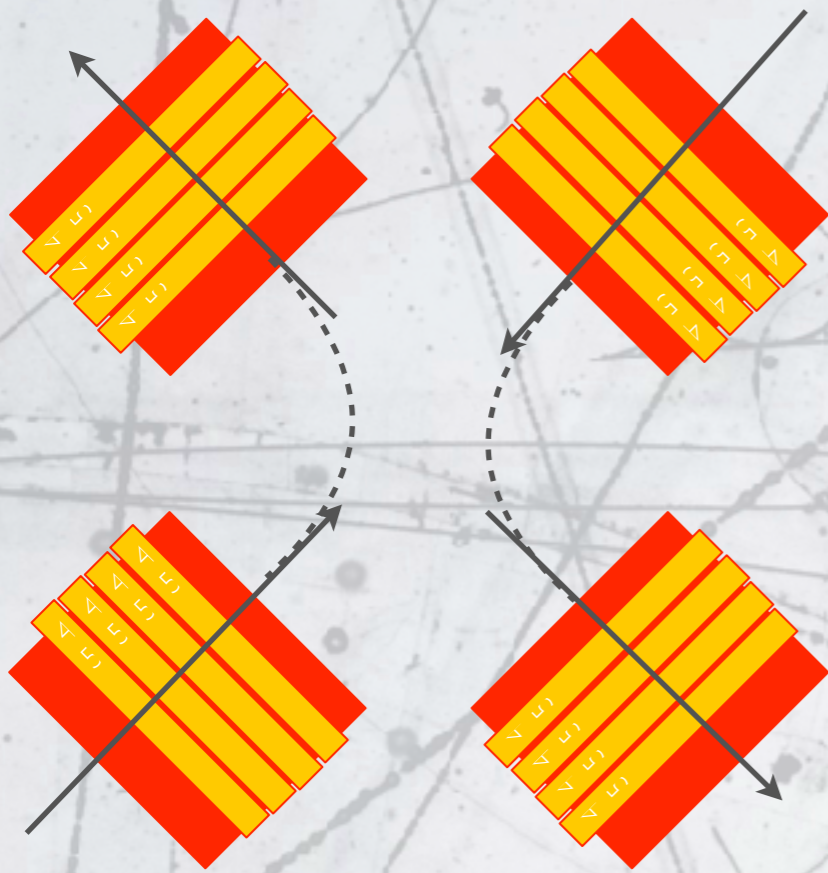
# MAGNETI DEFLETTORI

$$\vec{F} = q\vec{v} \wedge \vec{B}$$



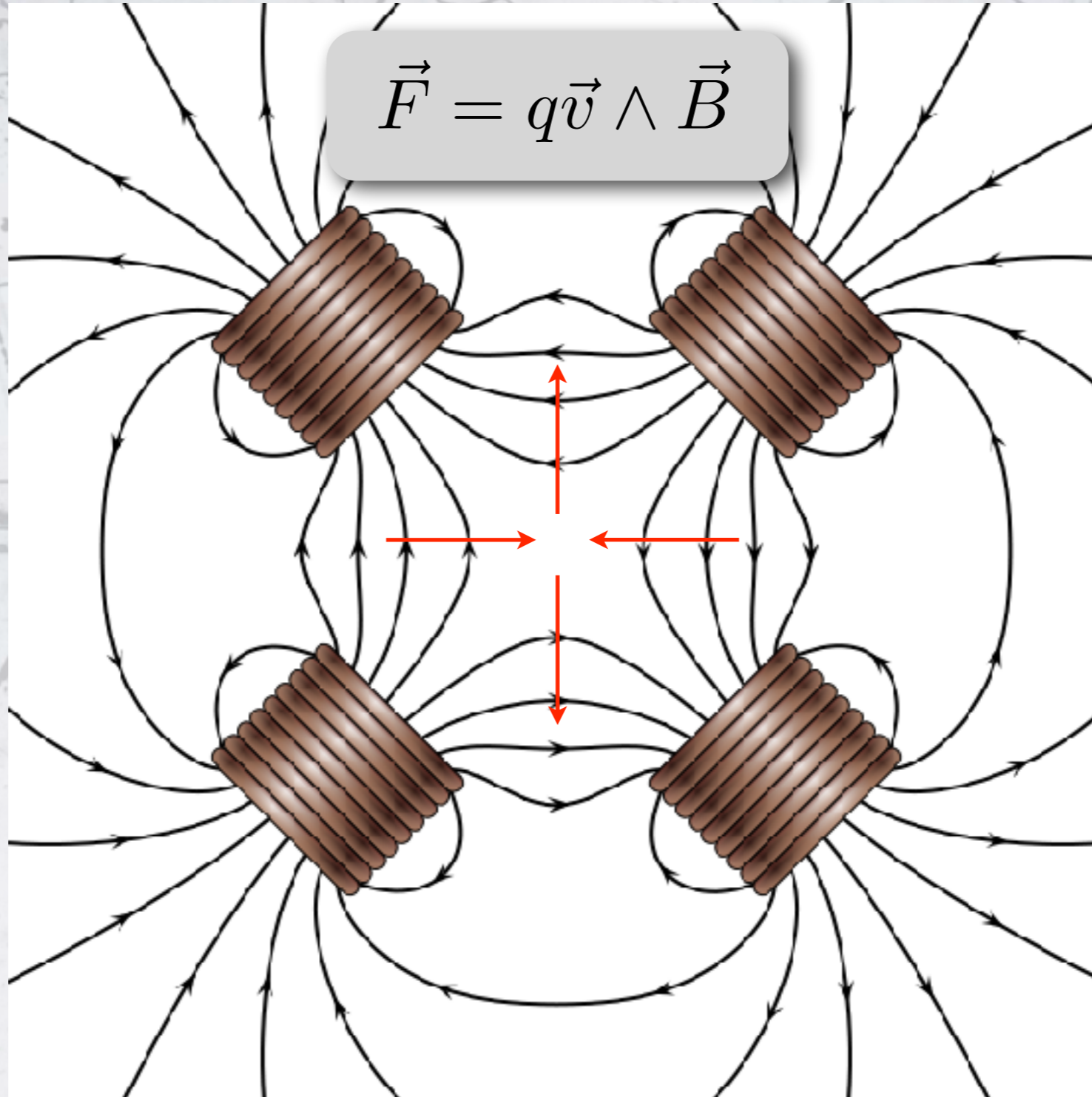
$$\vec{B} = \mu_0 n I \hat{z}$$

# FOCALIZZAZIONE

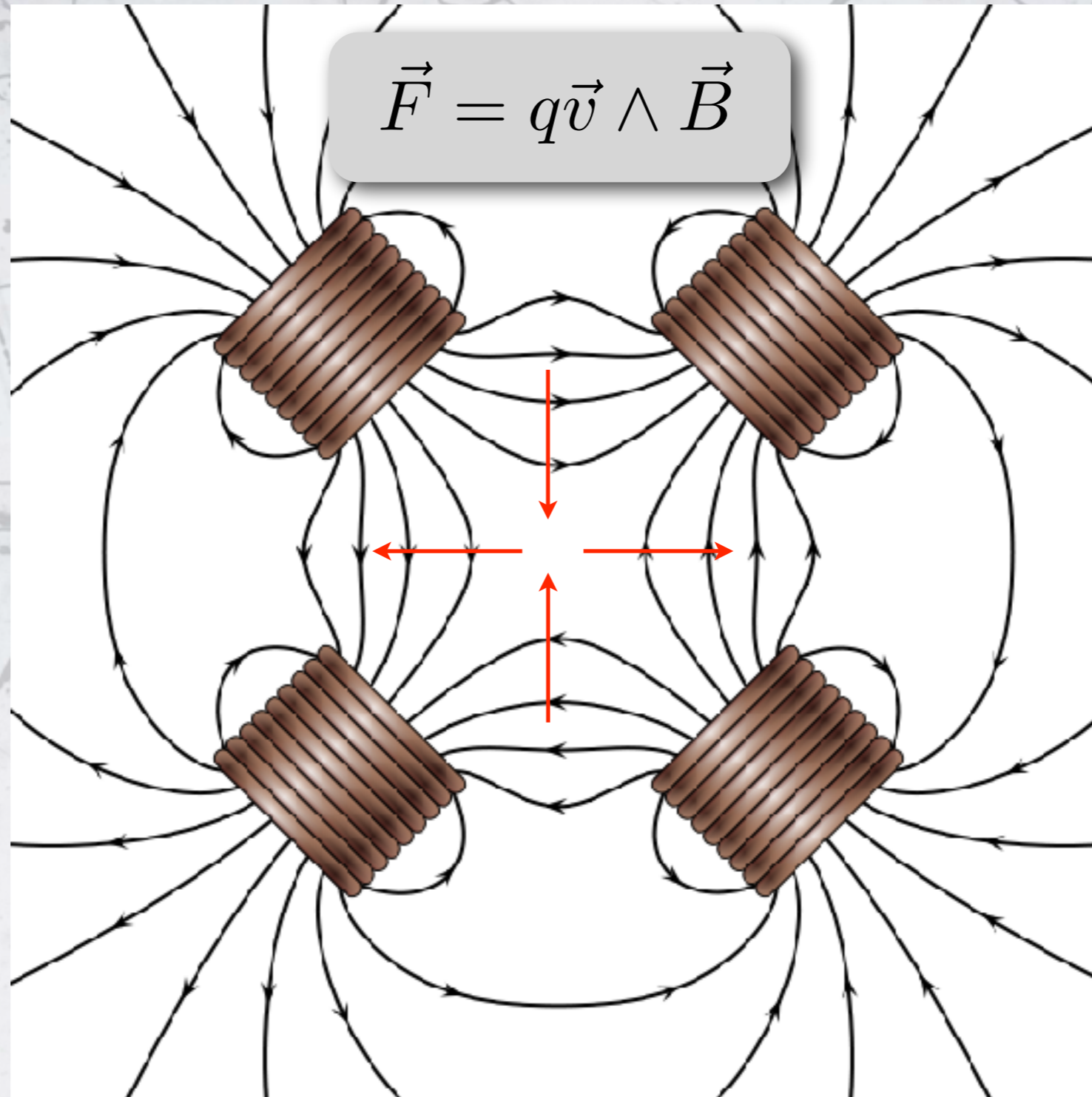


# QUADRUPOLI

$$\vec{F} = q\vec{v} \wedge \vec{B}$$



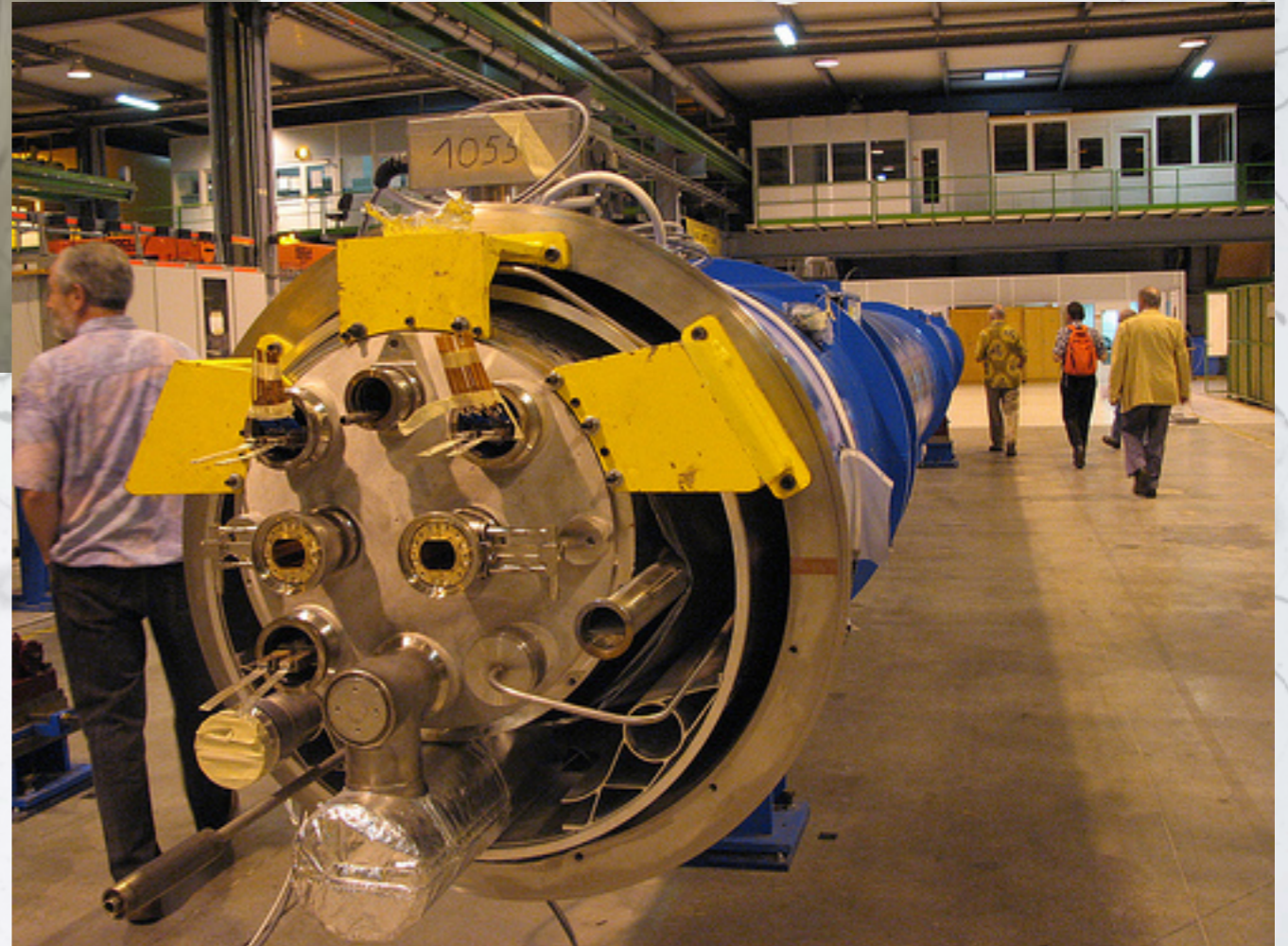
# QUADRUPOLI

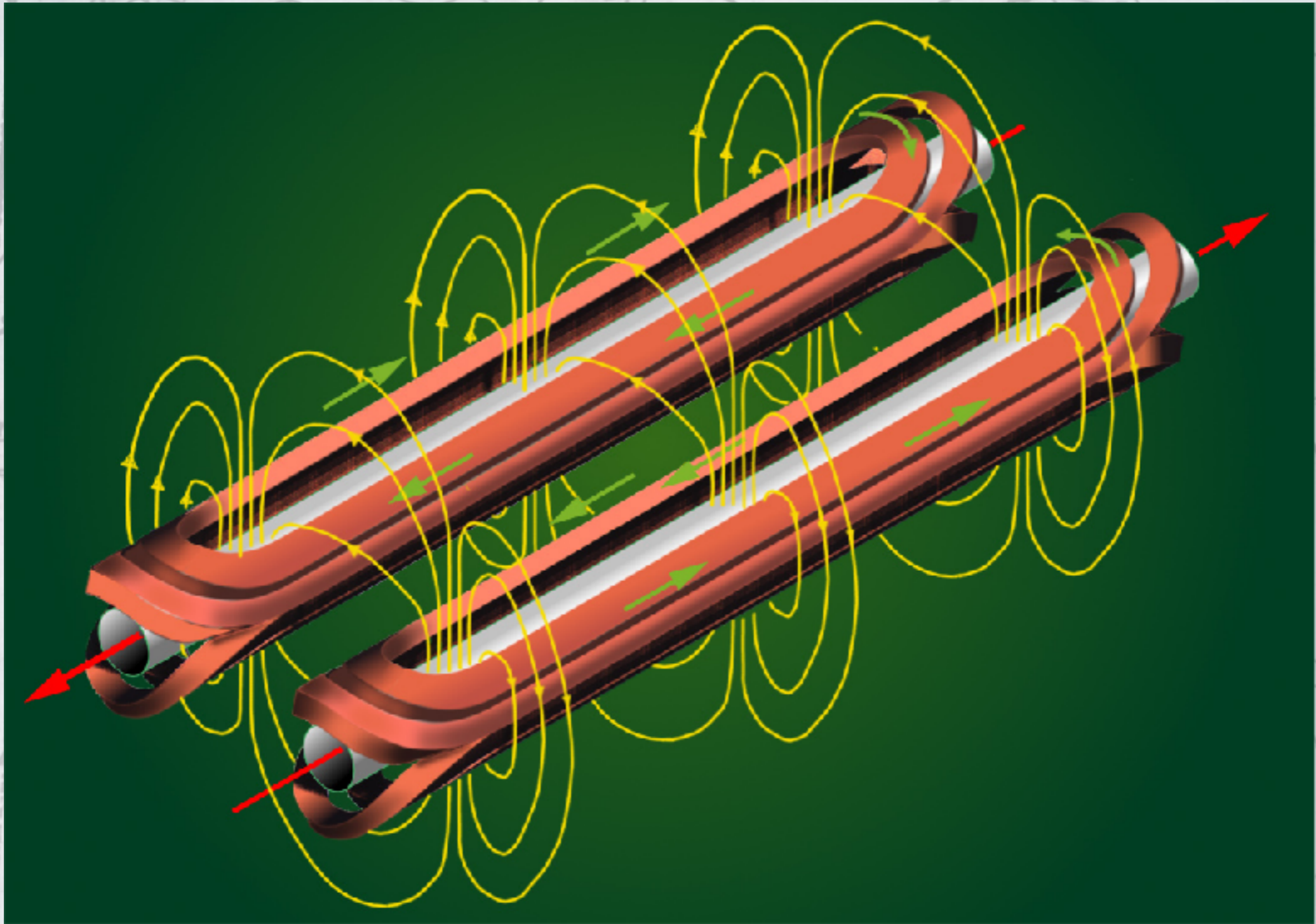


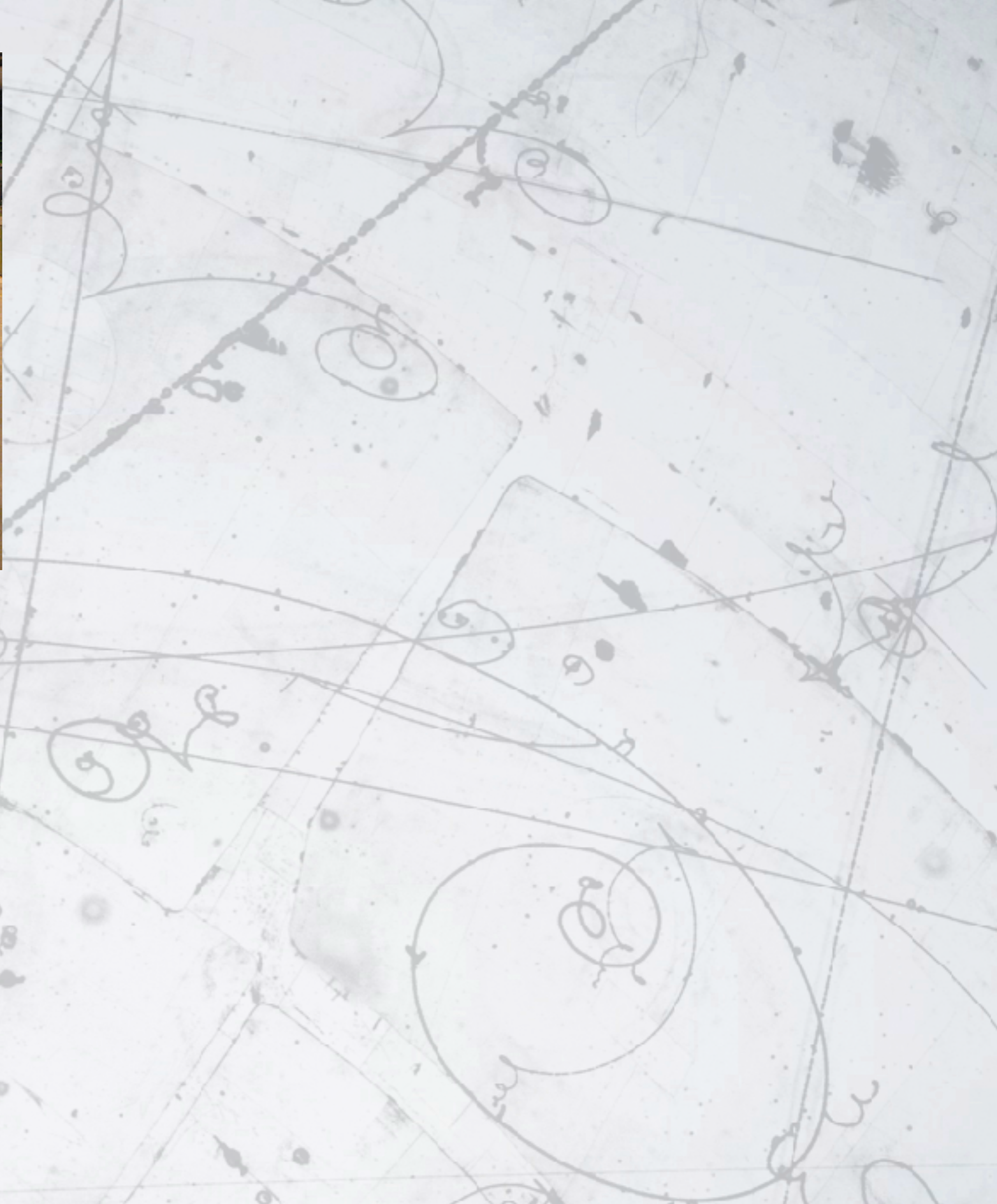
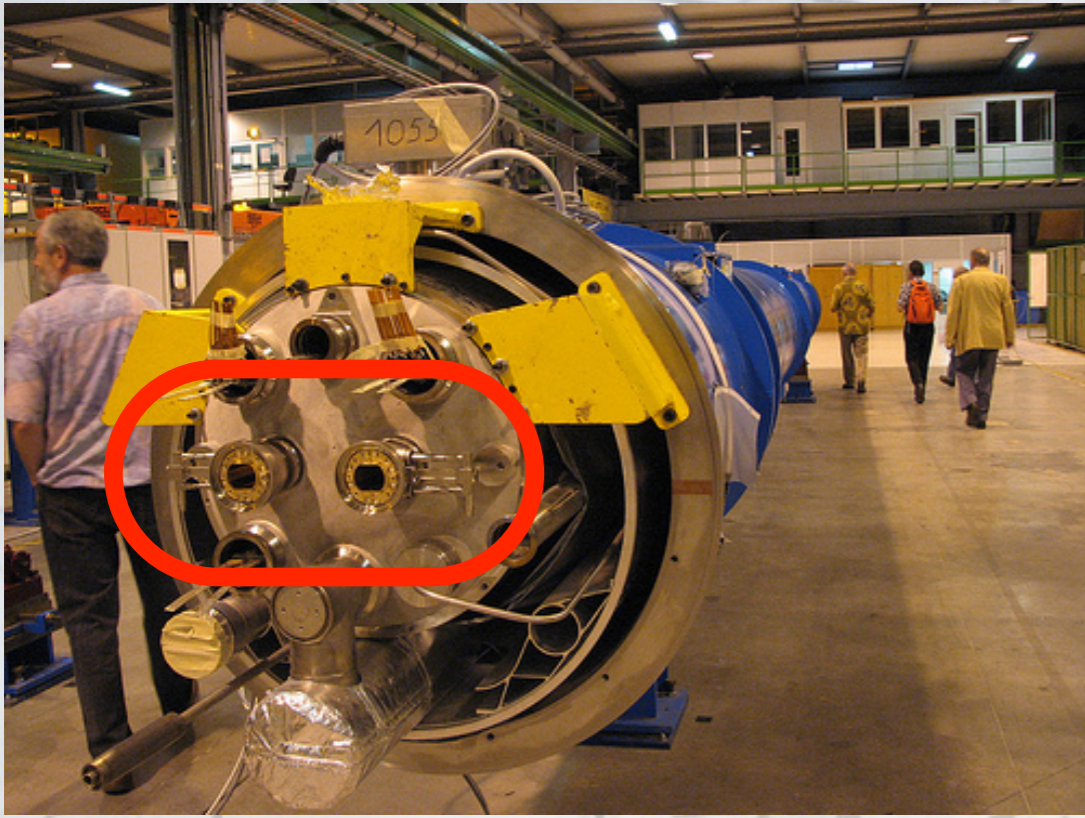
# LHC

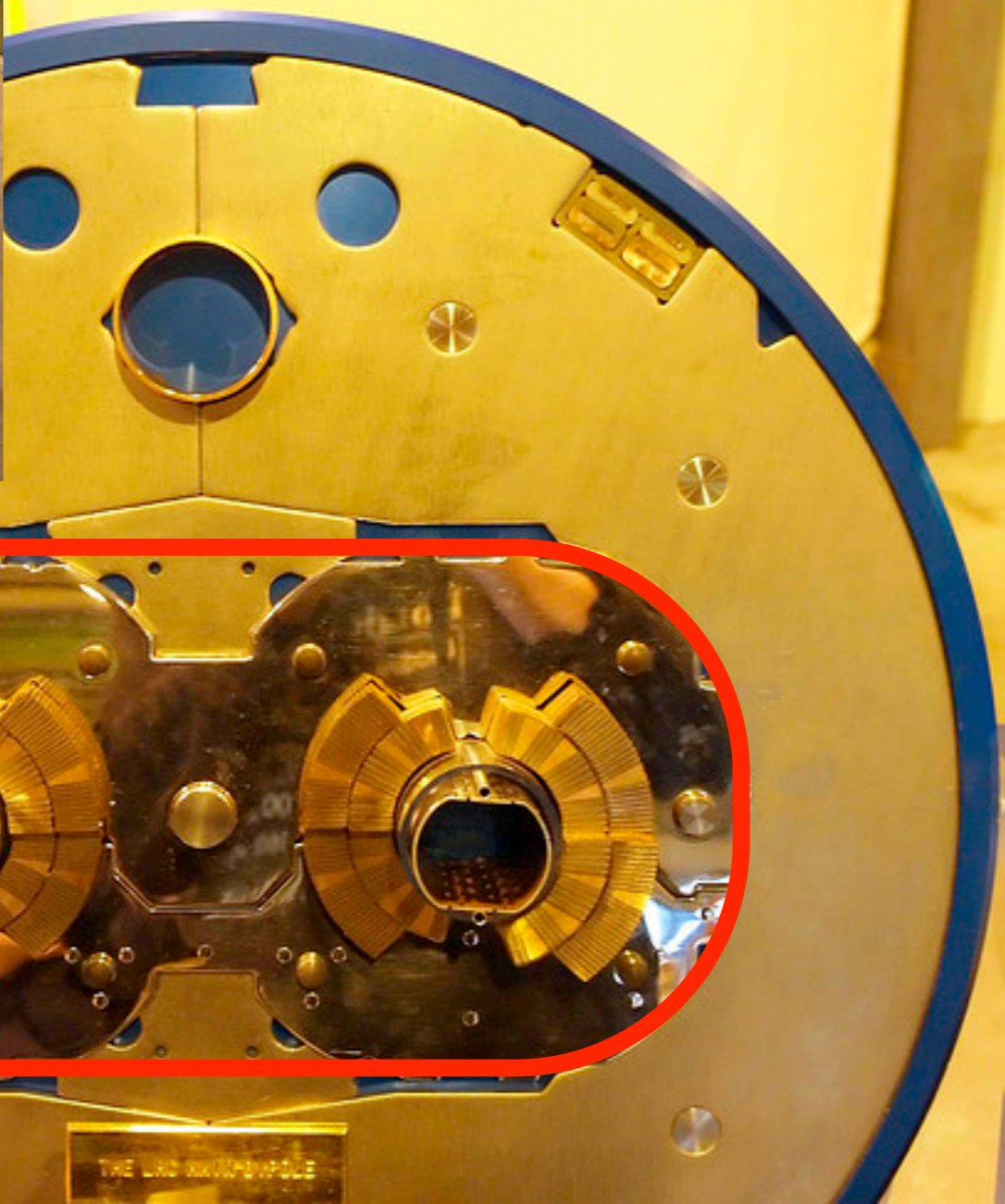
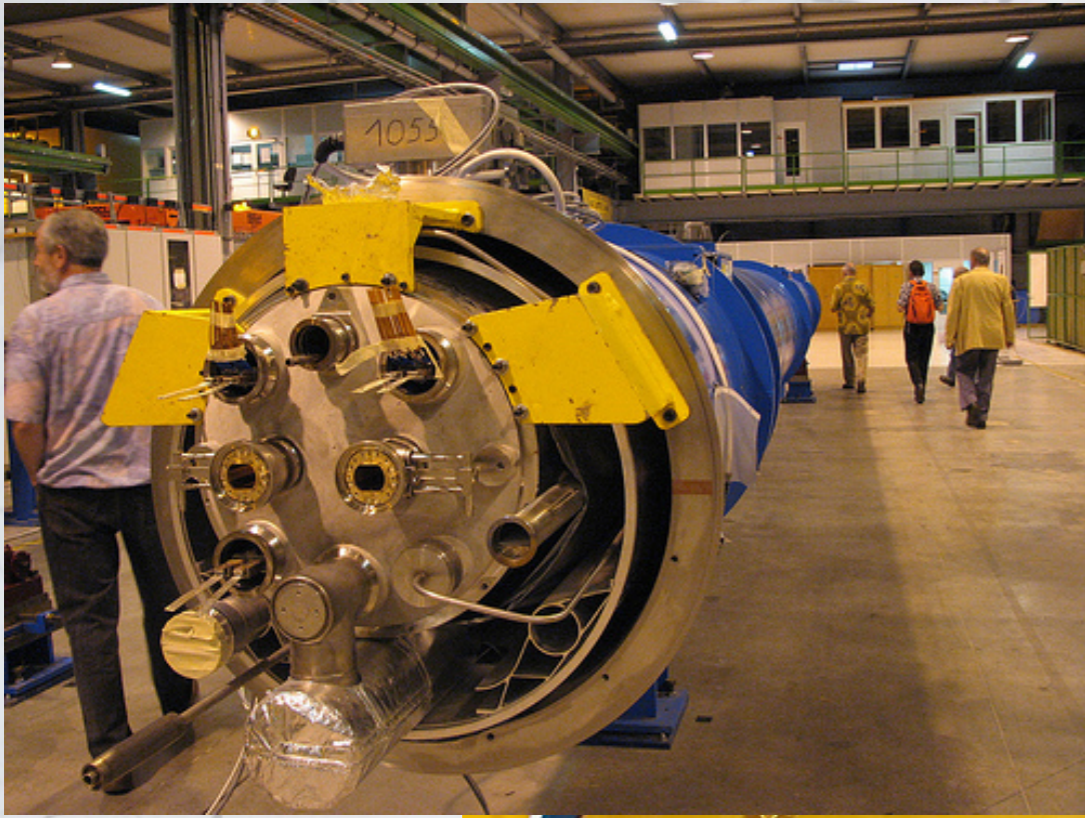


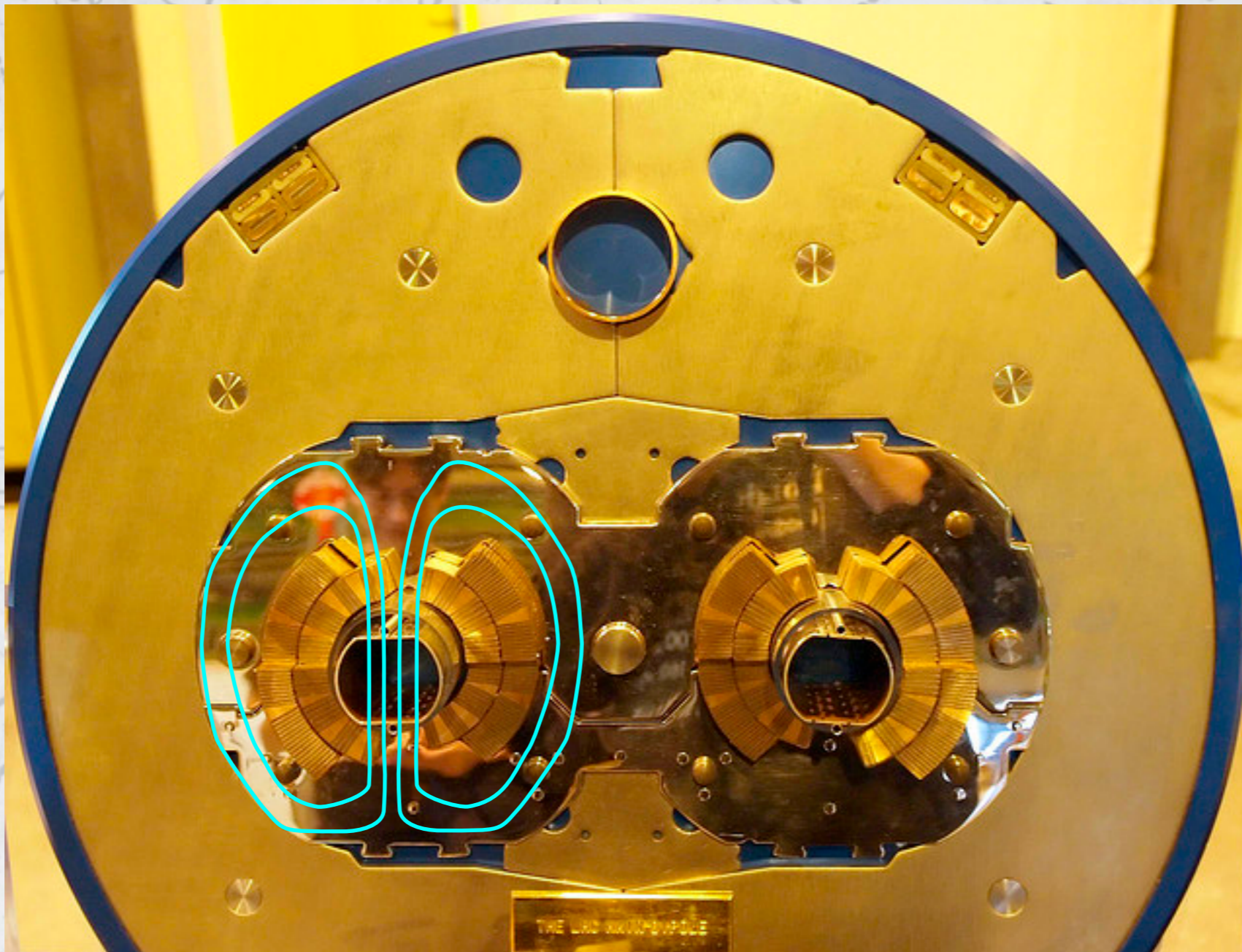
# LHC



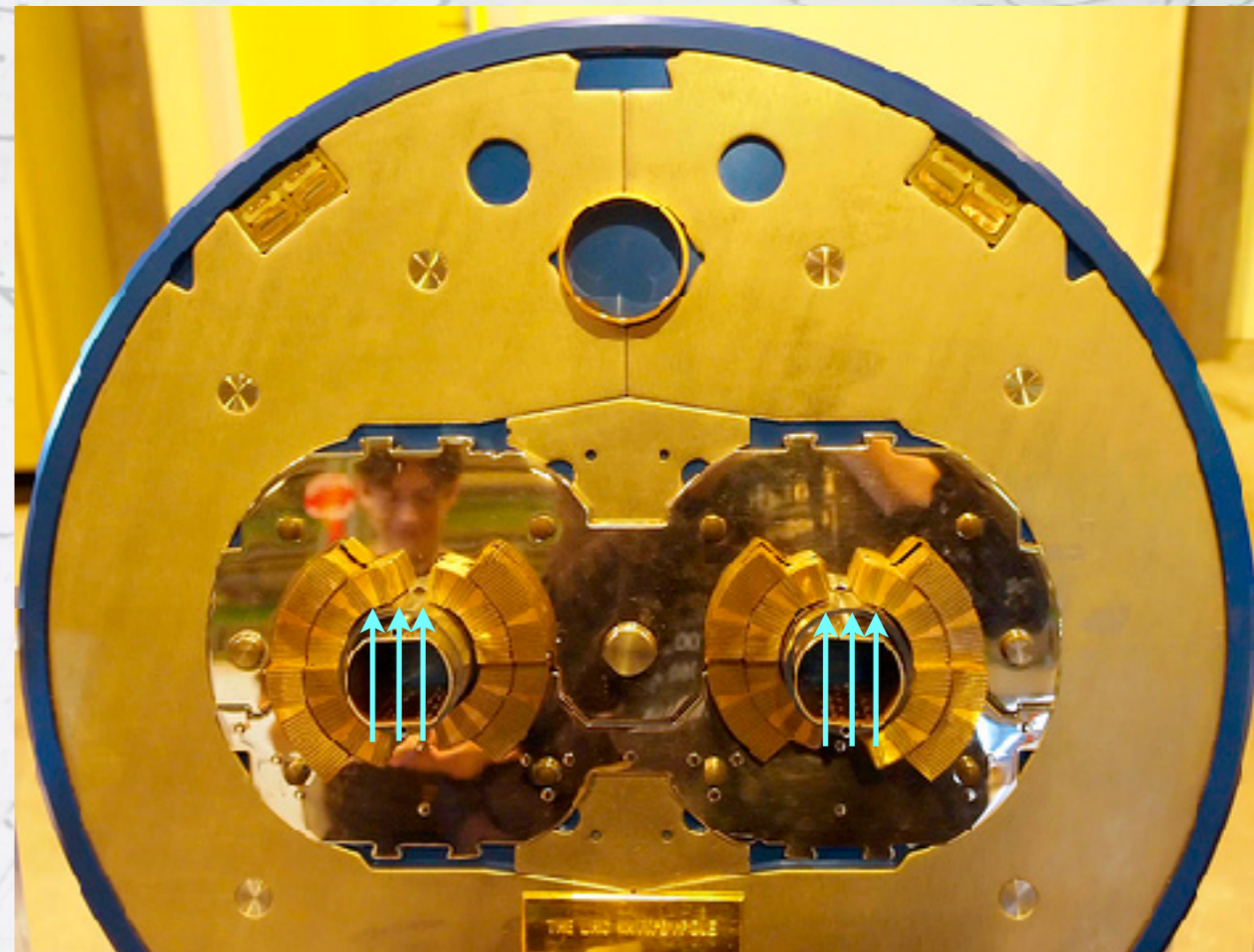


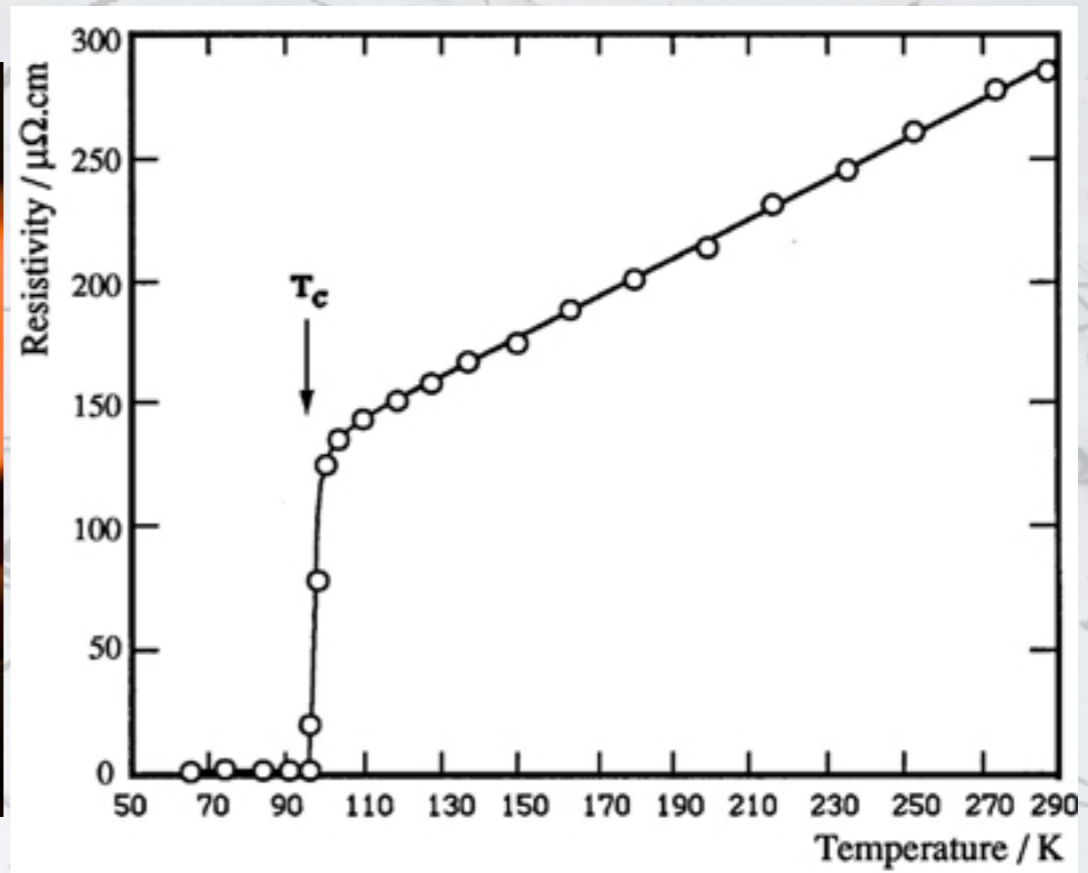






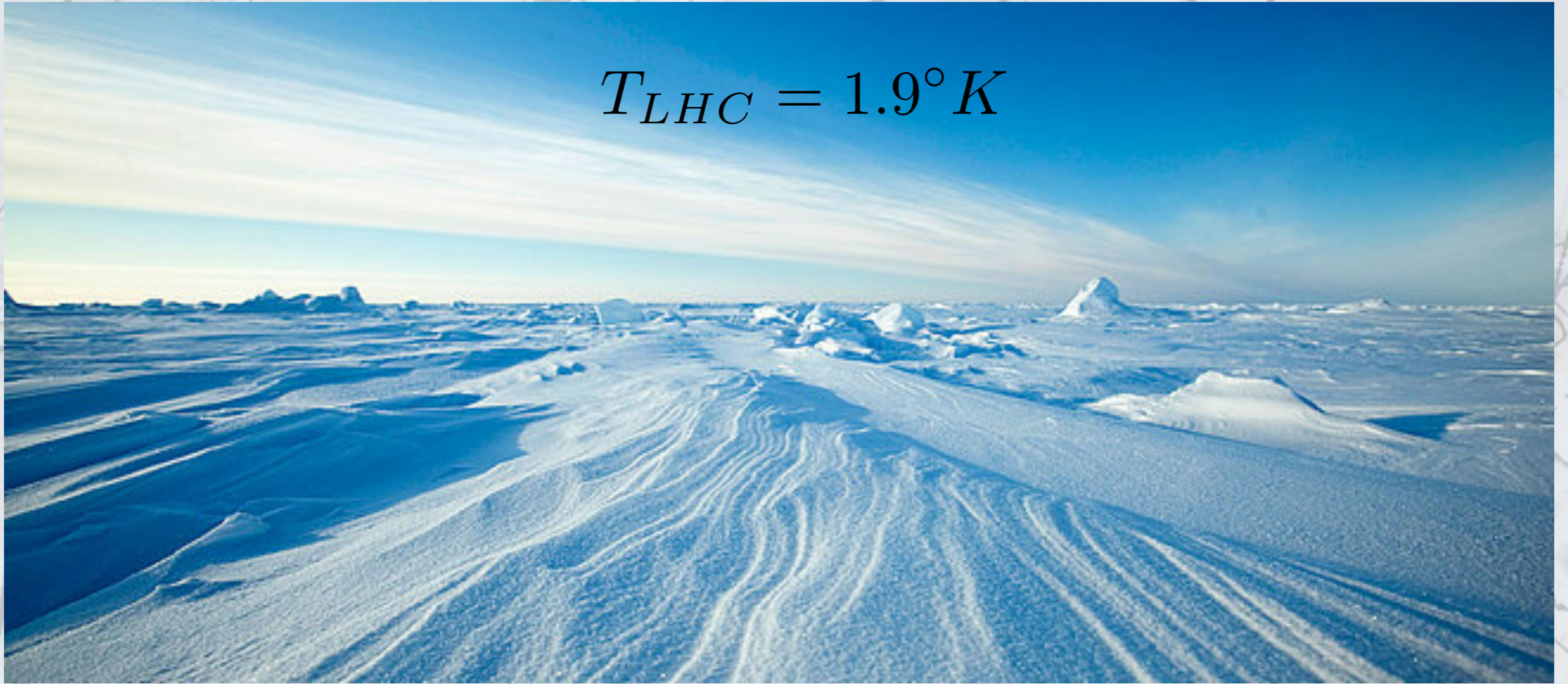
- 1232 dipoli magnetici
- $B = 8.33\text{ T}$  (100.000 volte più intenso di quello terrestre)
- $I = 12000\text{ A}$  (utenze domestiche:  $\sim 13\text{ A}$ )
- lunghezza del dipolo: 14.3 m
- 1 miliardo di km di cavo





# LA TEMPERATURA DI LHC

$$T_{LHC} = 1.9^{\circ}K$$

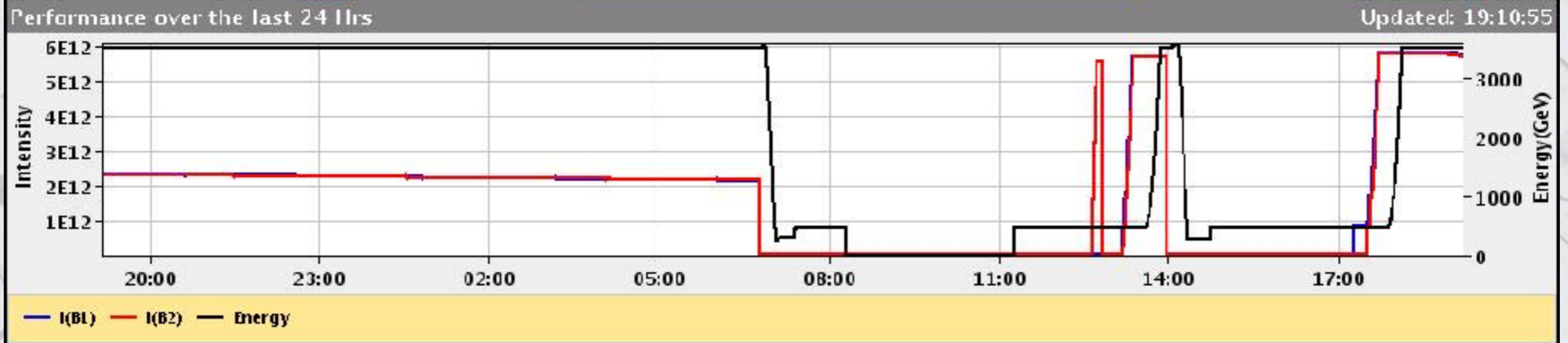


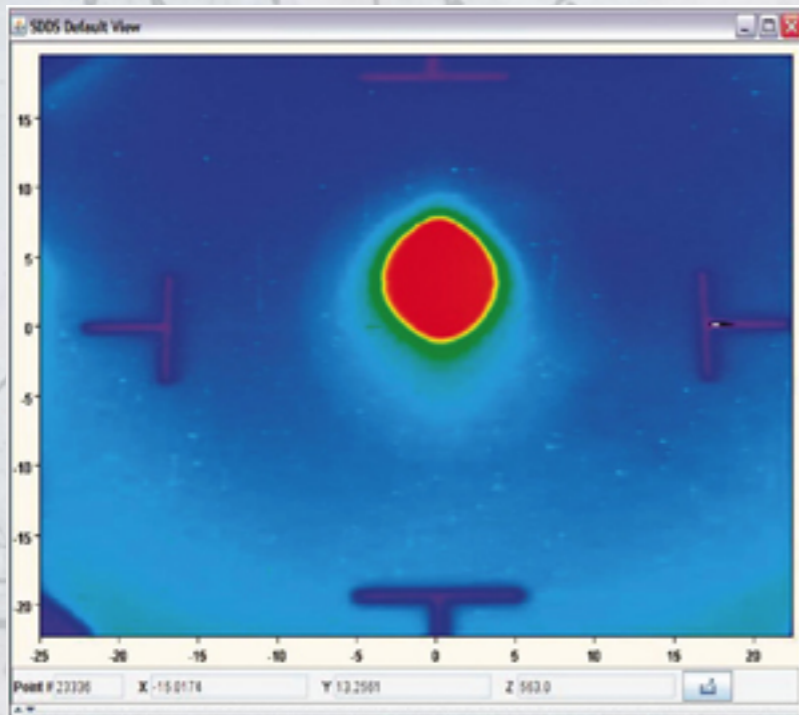
# L'ENERGIA DI LHC

23-Sep-2010 19:11:05 Fill #: 1366 Energy: 3500 GeV I(B1): 5.75e+12 I(B2): 5.73e+12

	ATLAS	ALICE	CMS	LHCb
Experiment Status	STANDBY	NOT READY	STANDBY	STANDBY
Instantaneous Lumi (ub.s) <sup>-1</sup>	20.007	0.304	20.380	18.621
BRAN Luminosity (ub.s) <sup>-1</sup>	18.297	0.345	8.214	16.075
Fill Luminosity (nb) <sup>-1</sup>	0.3	--	0.1	0.0
BKGD 1	0.000	0.013	34.354	0.254
BKGD 2	32.000	2.058	0.002	5.466
BKGD 3	6.000	0.008	0.000	0.136

LHCb VELO Position **OUT** Gap: 58.0 mm STAB... TOTEM: **STANDBY**





**$E_{LHC} = 360 \text{ MJ}$**

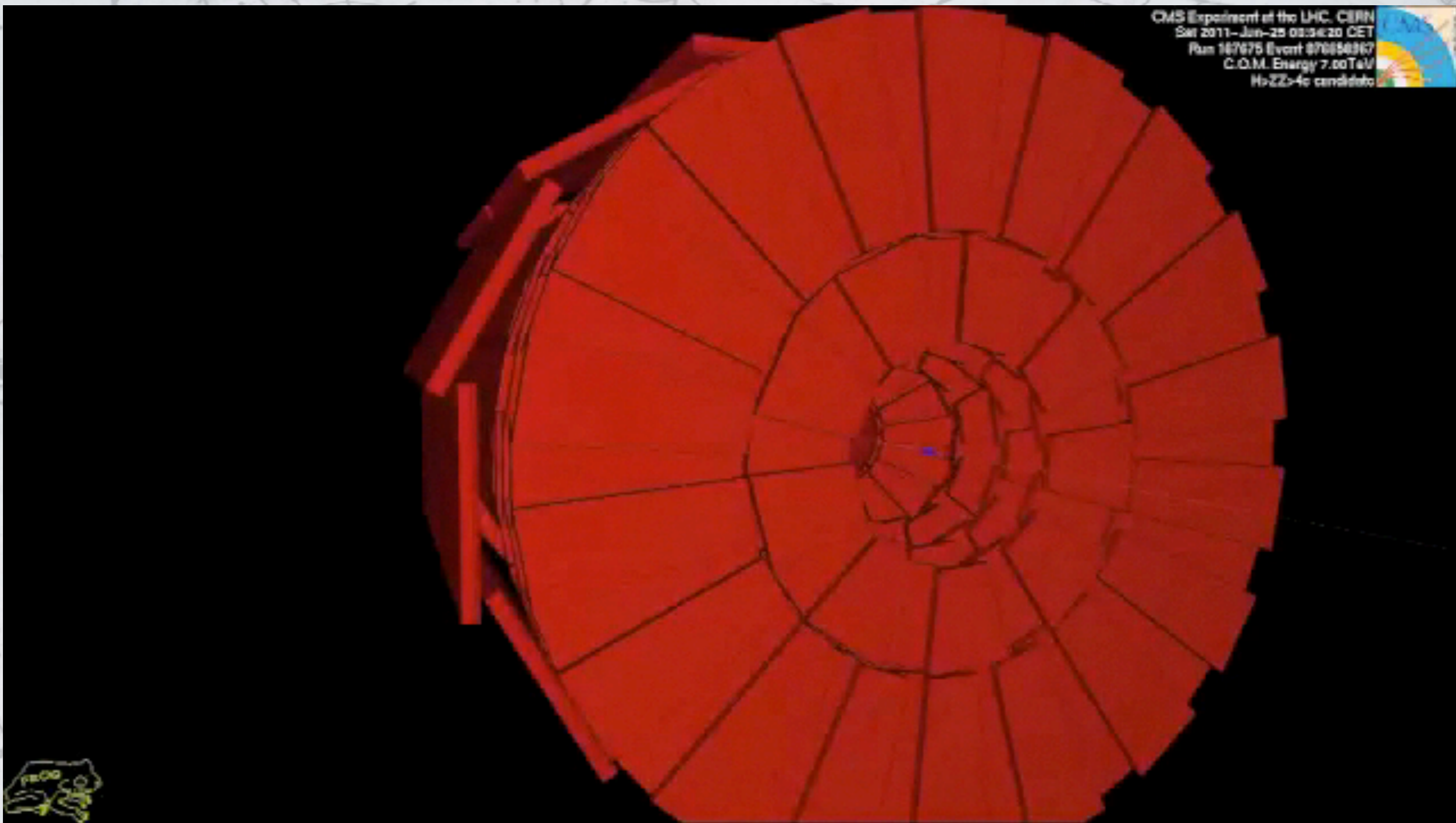


**$E_{FR} = 900 \text{ MJ}$**

2 motrici + 11 carrozze @ 200 km/h

# COME SI USA UN ACCELERATORE

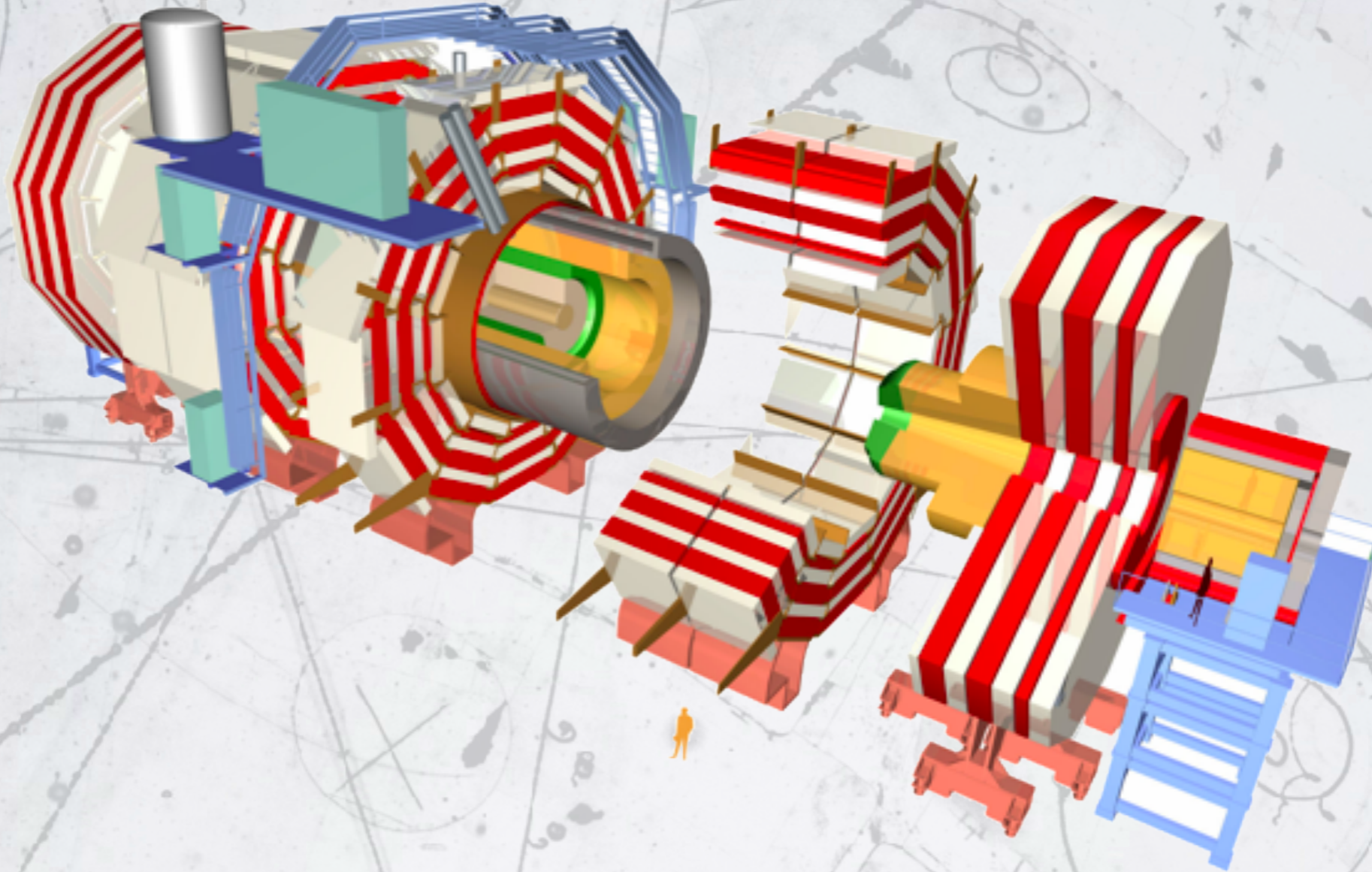




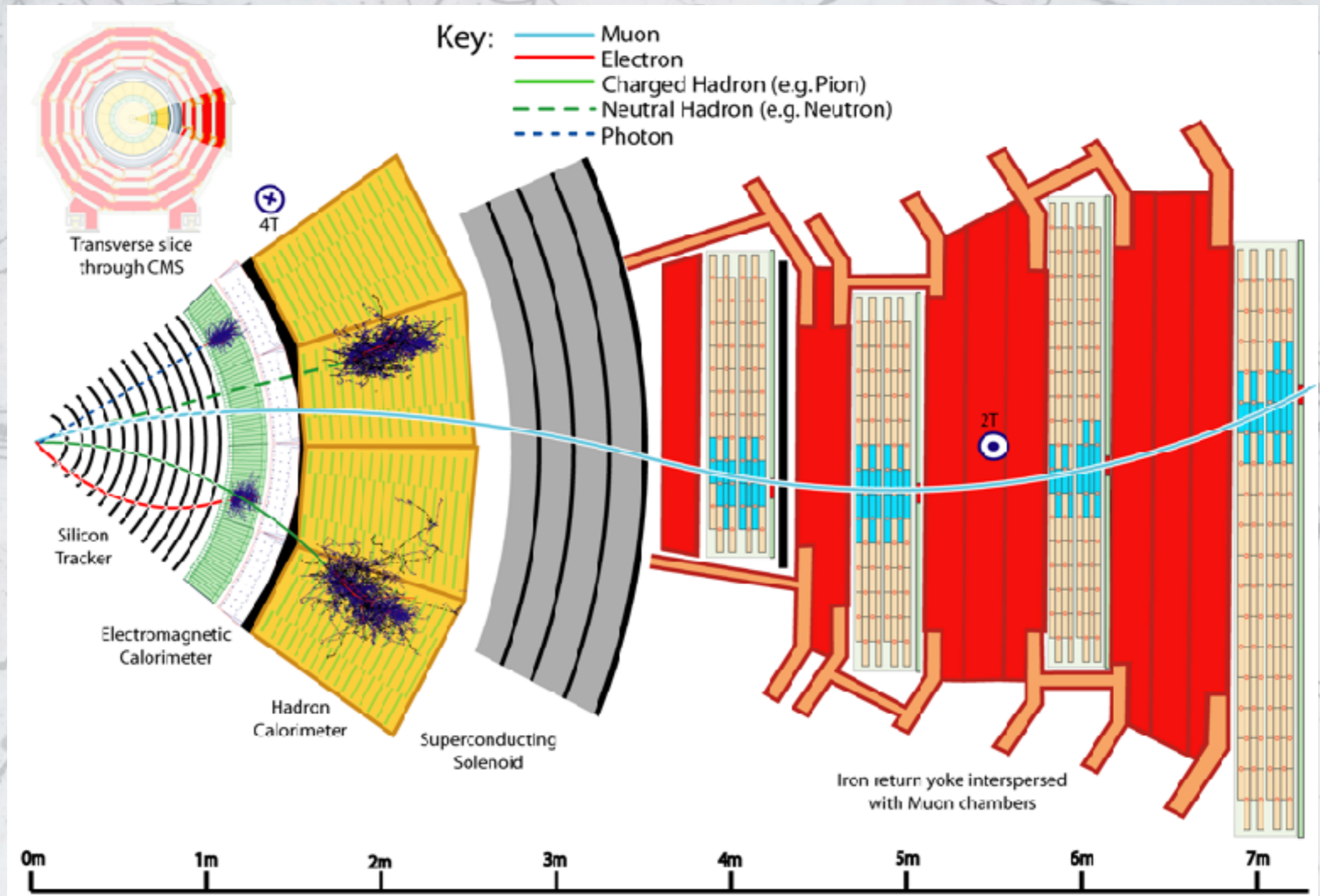
# SULLE TRACCE DELLE PARTICELLE



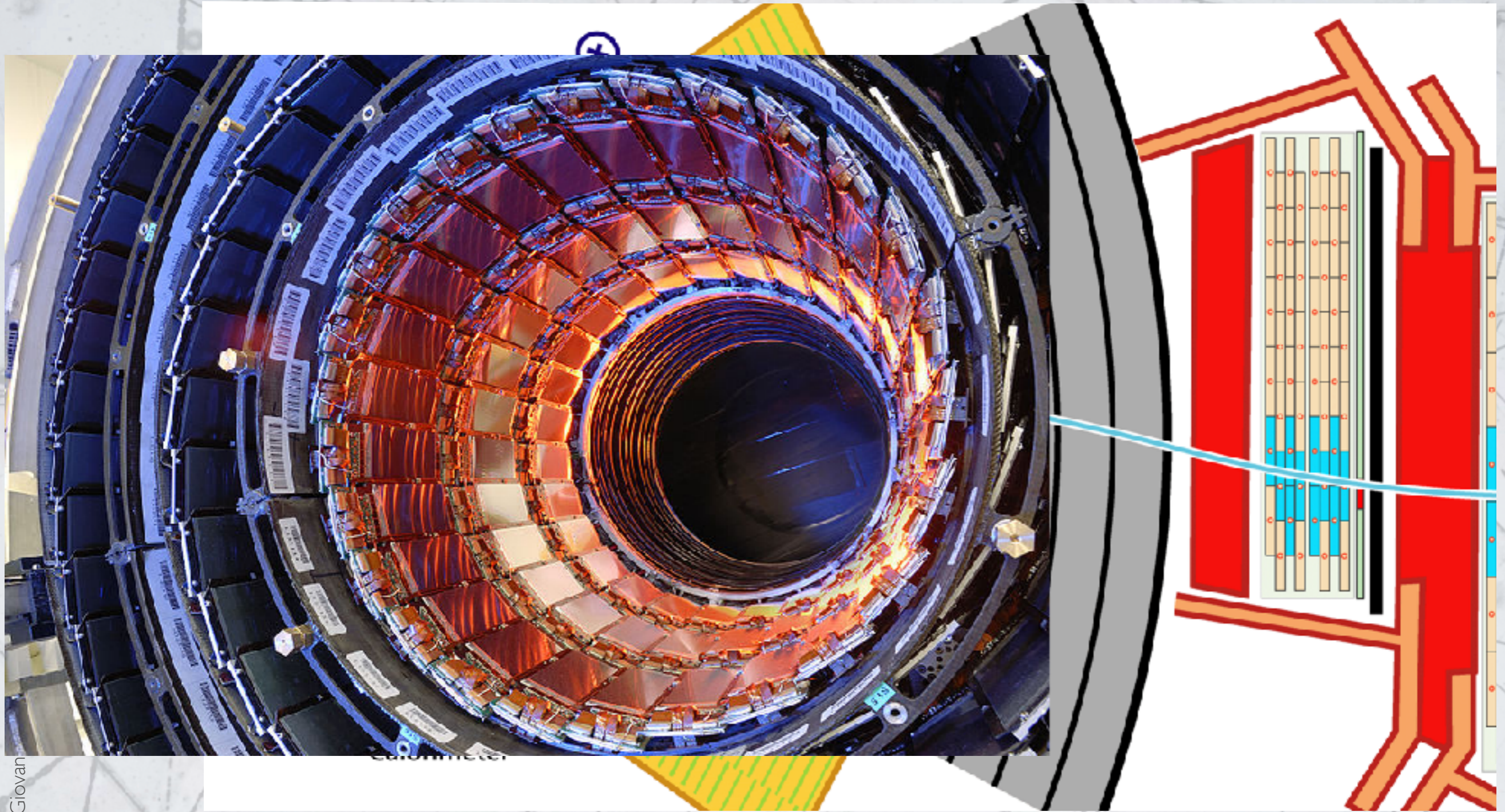
# UN RIVELATORE



# UN RIVELATORE DI PARTICELLE

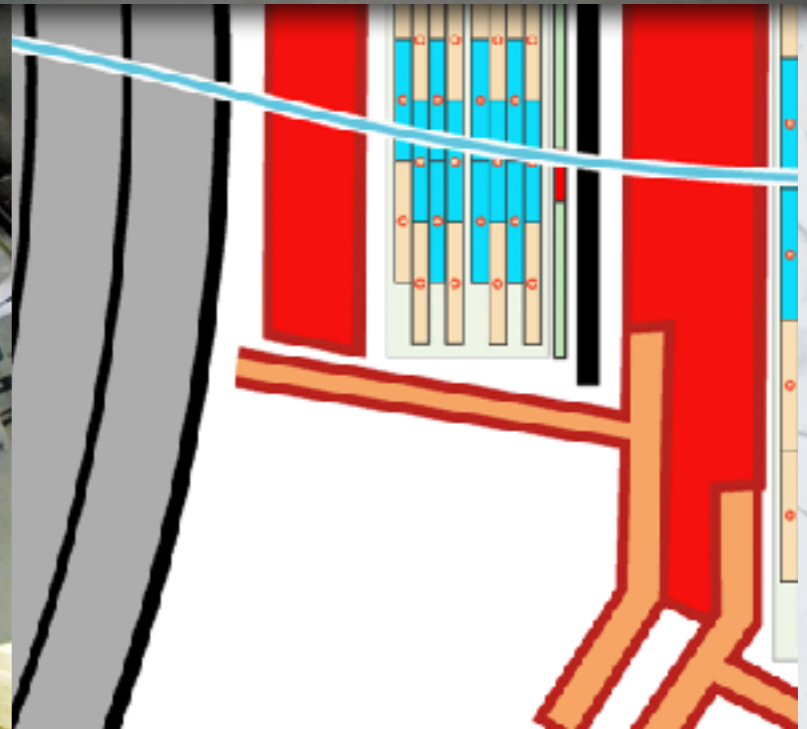
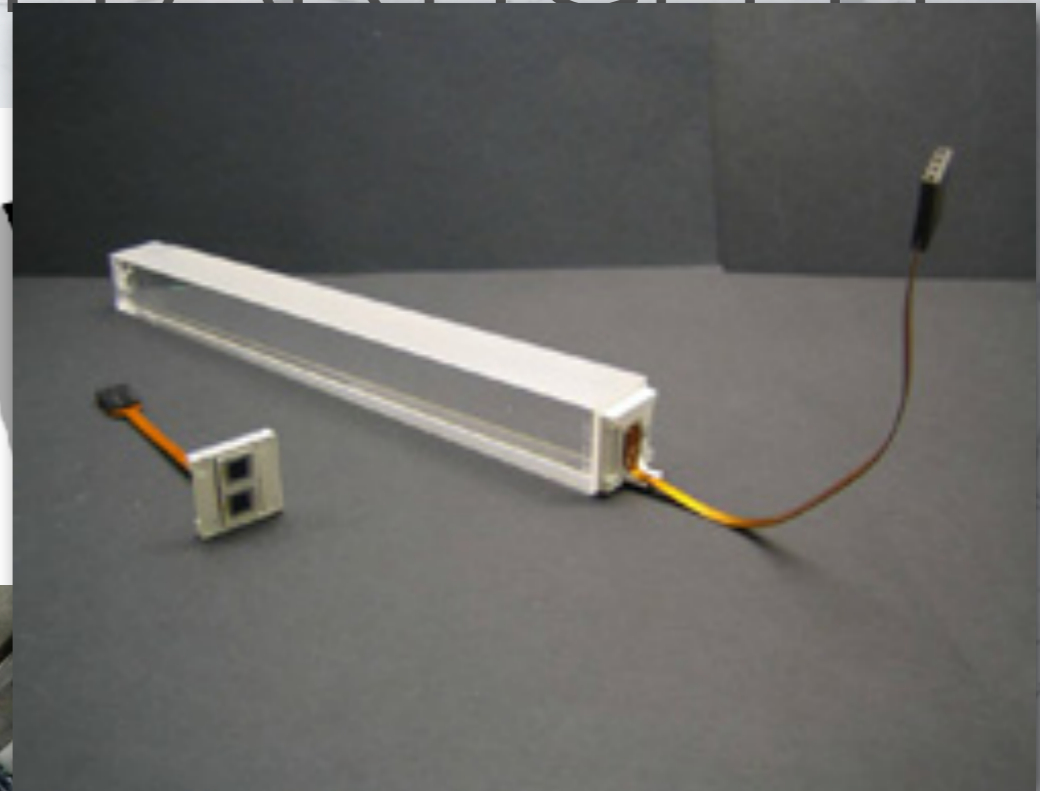
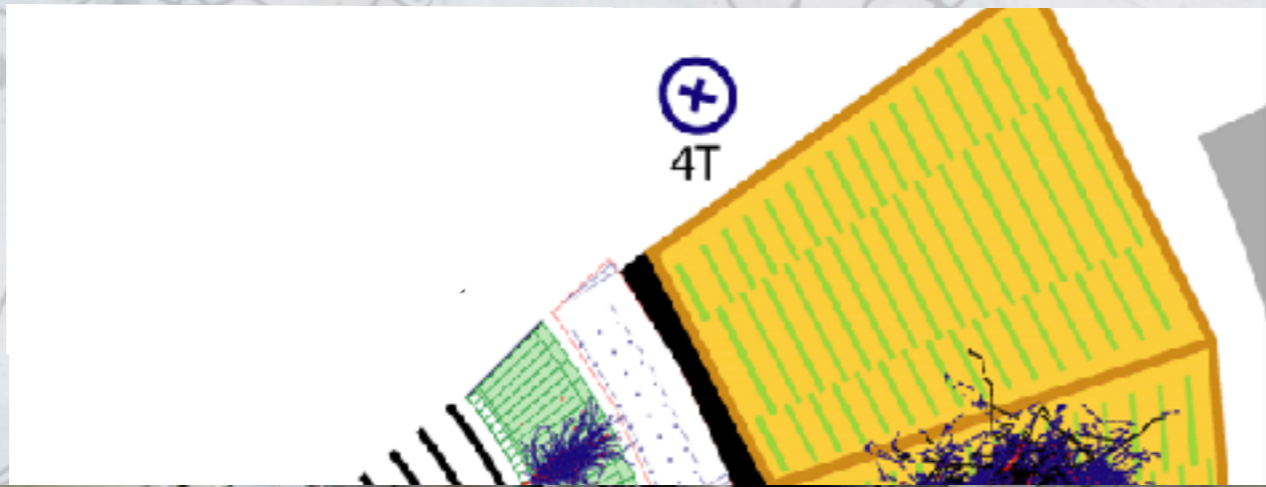


# UN RIVELATORE DI PARTICELLE



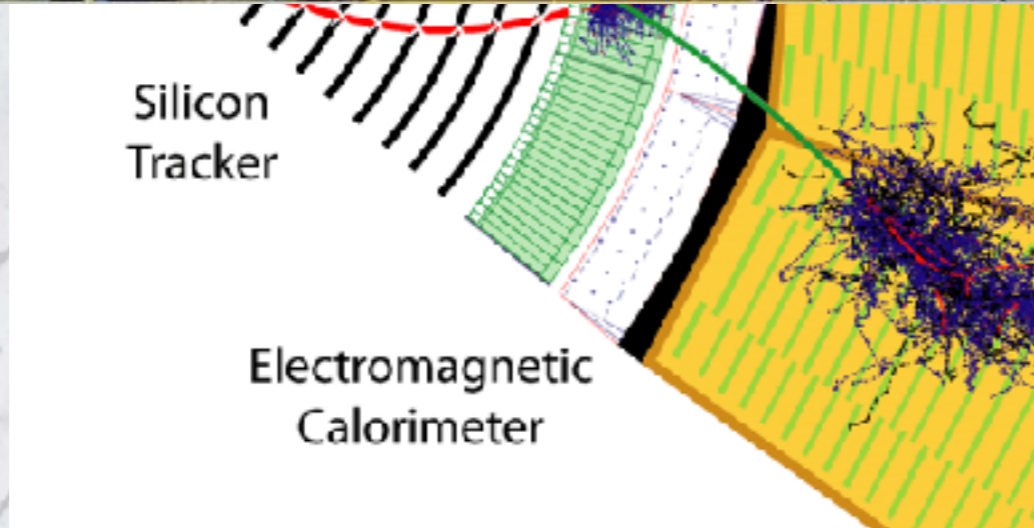
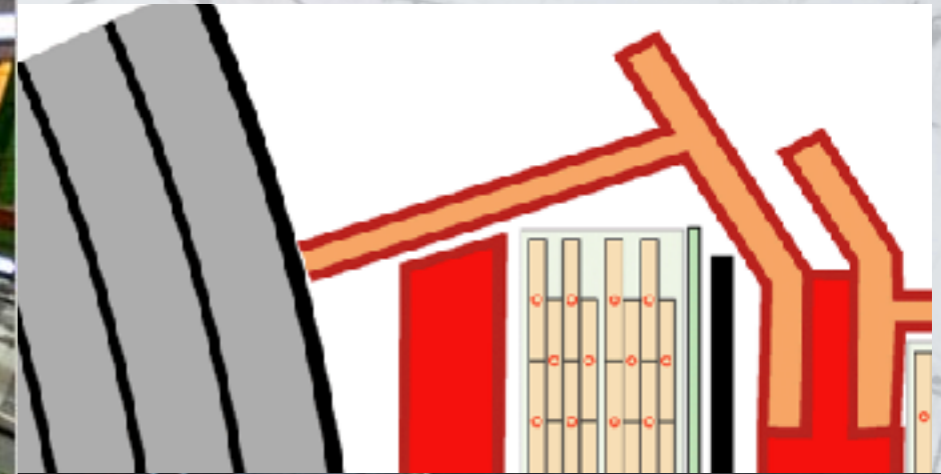
Giovan

# UN RIVELATORE DI PARTICELLE

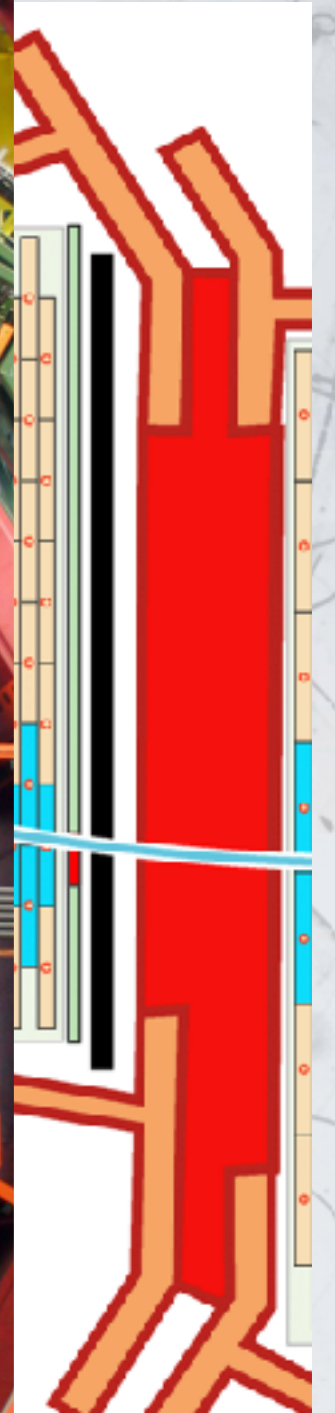
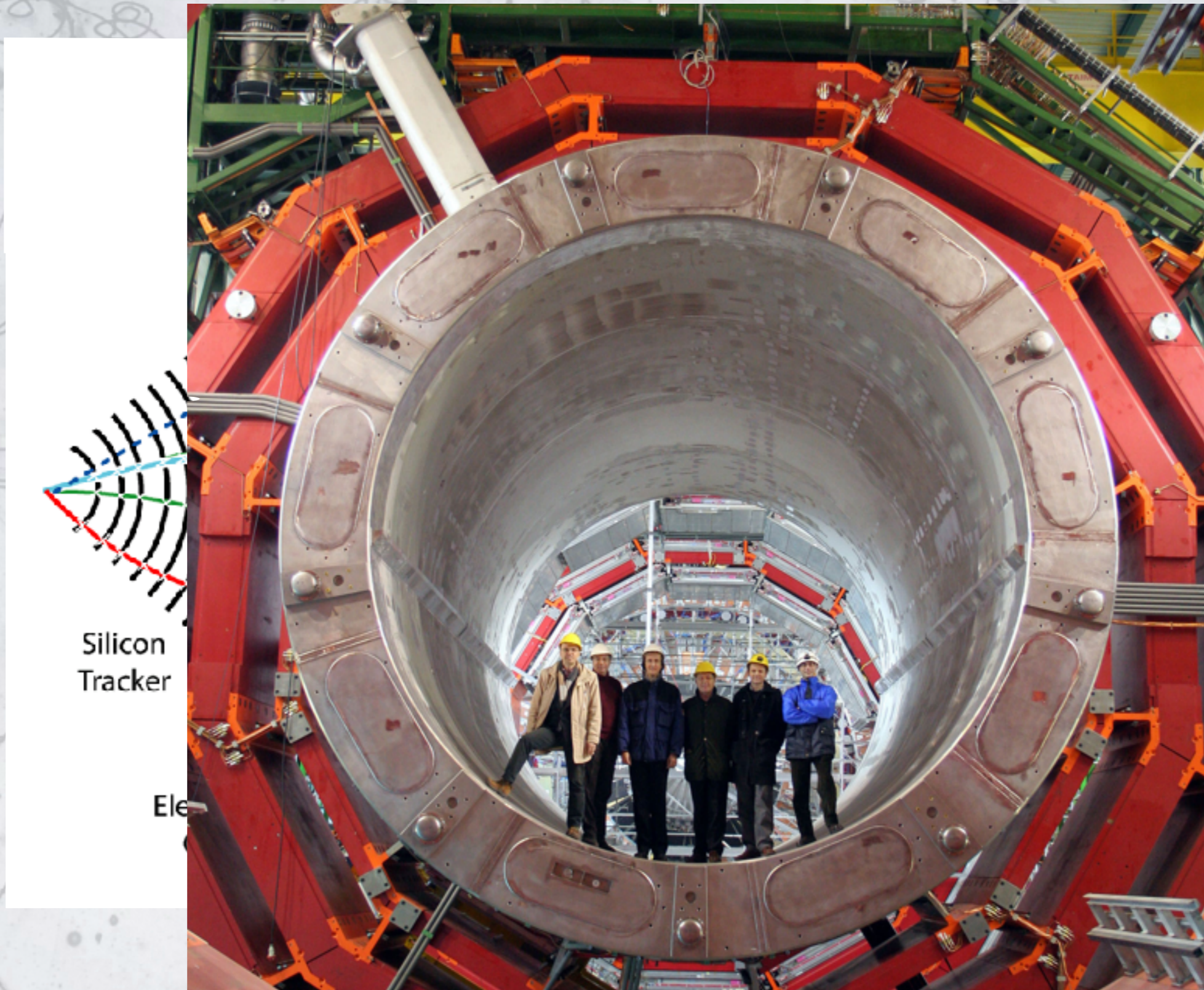


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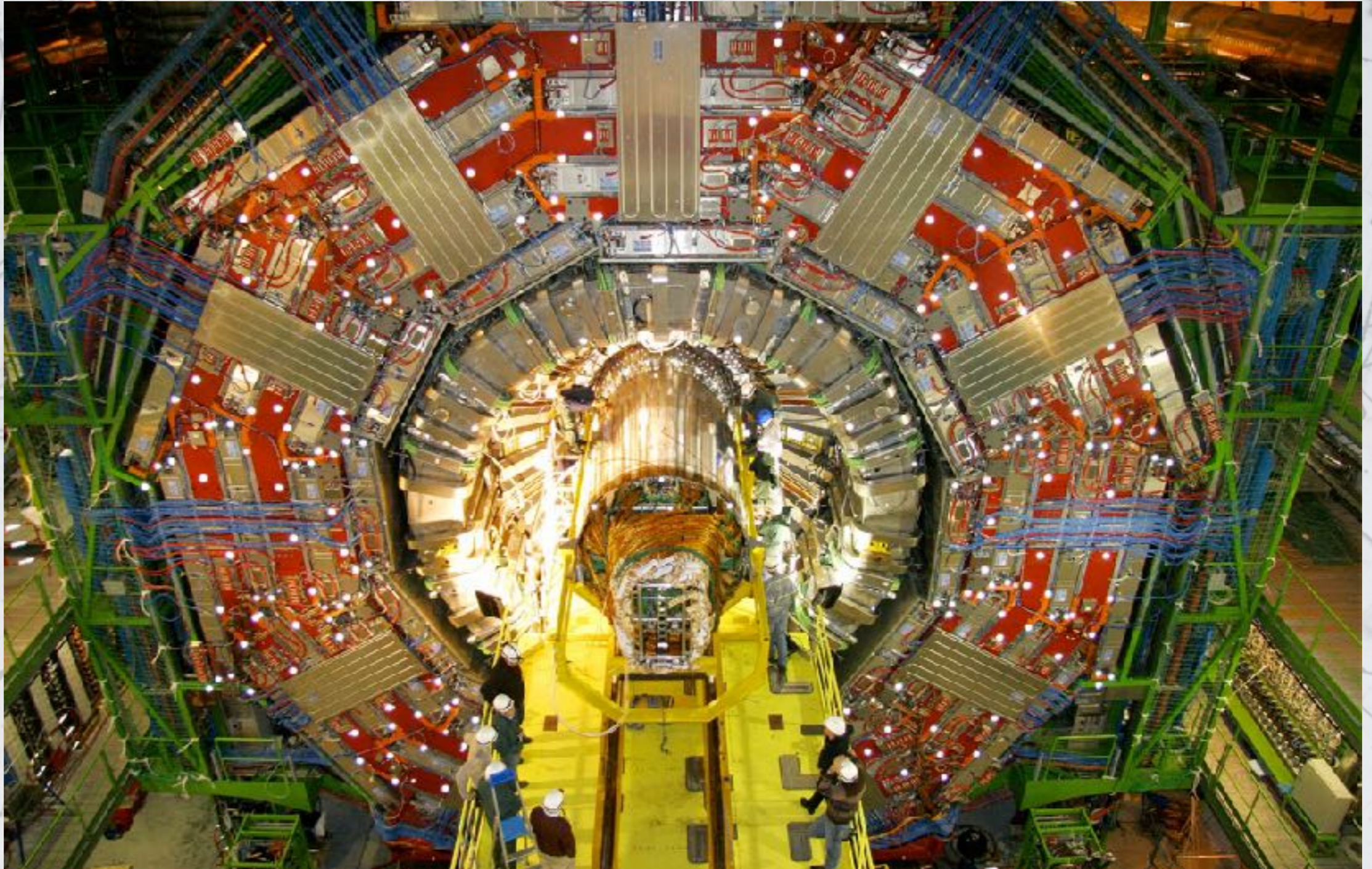
# UN RIVELATORE DI PARTICELLE

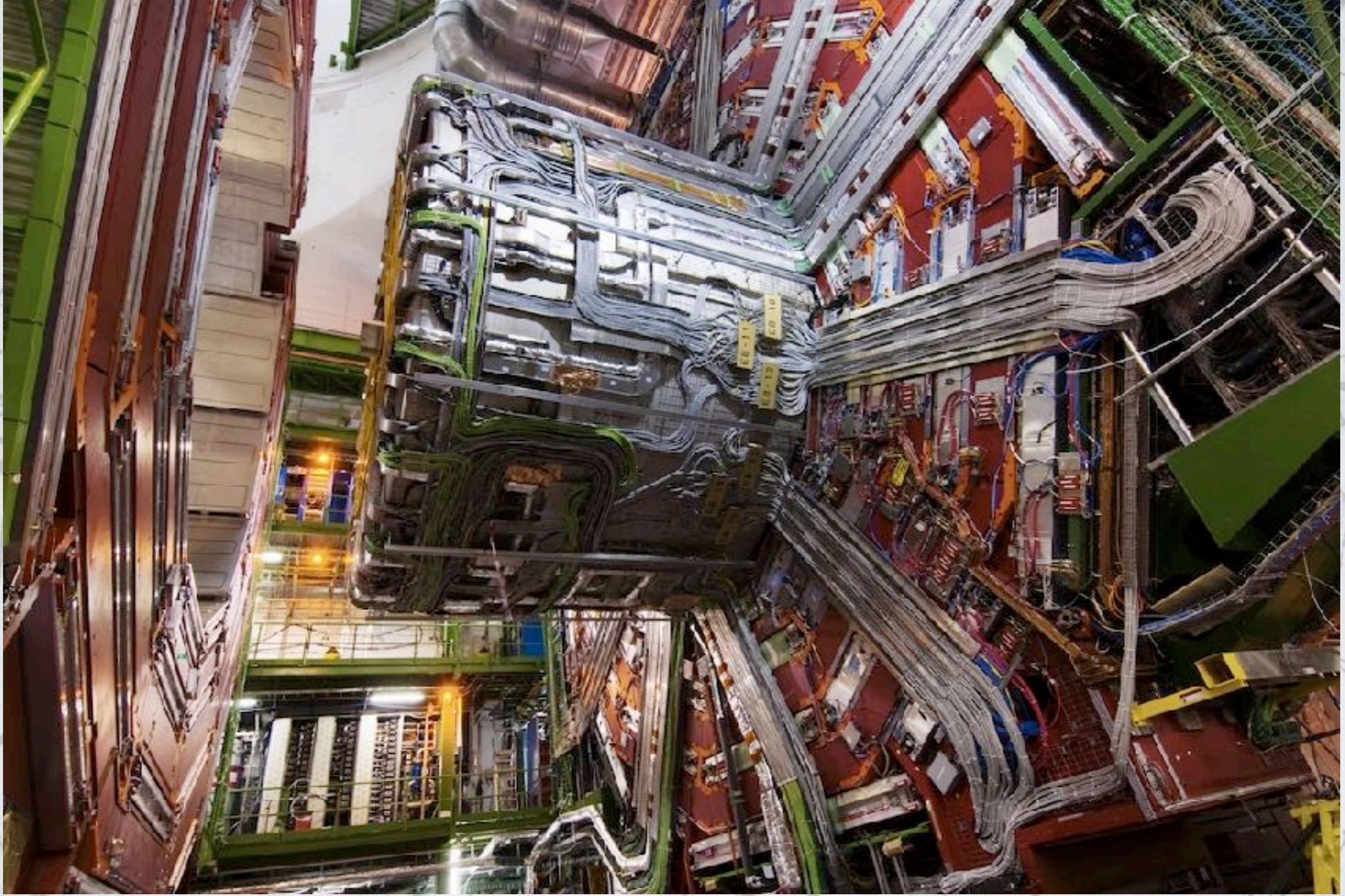


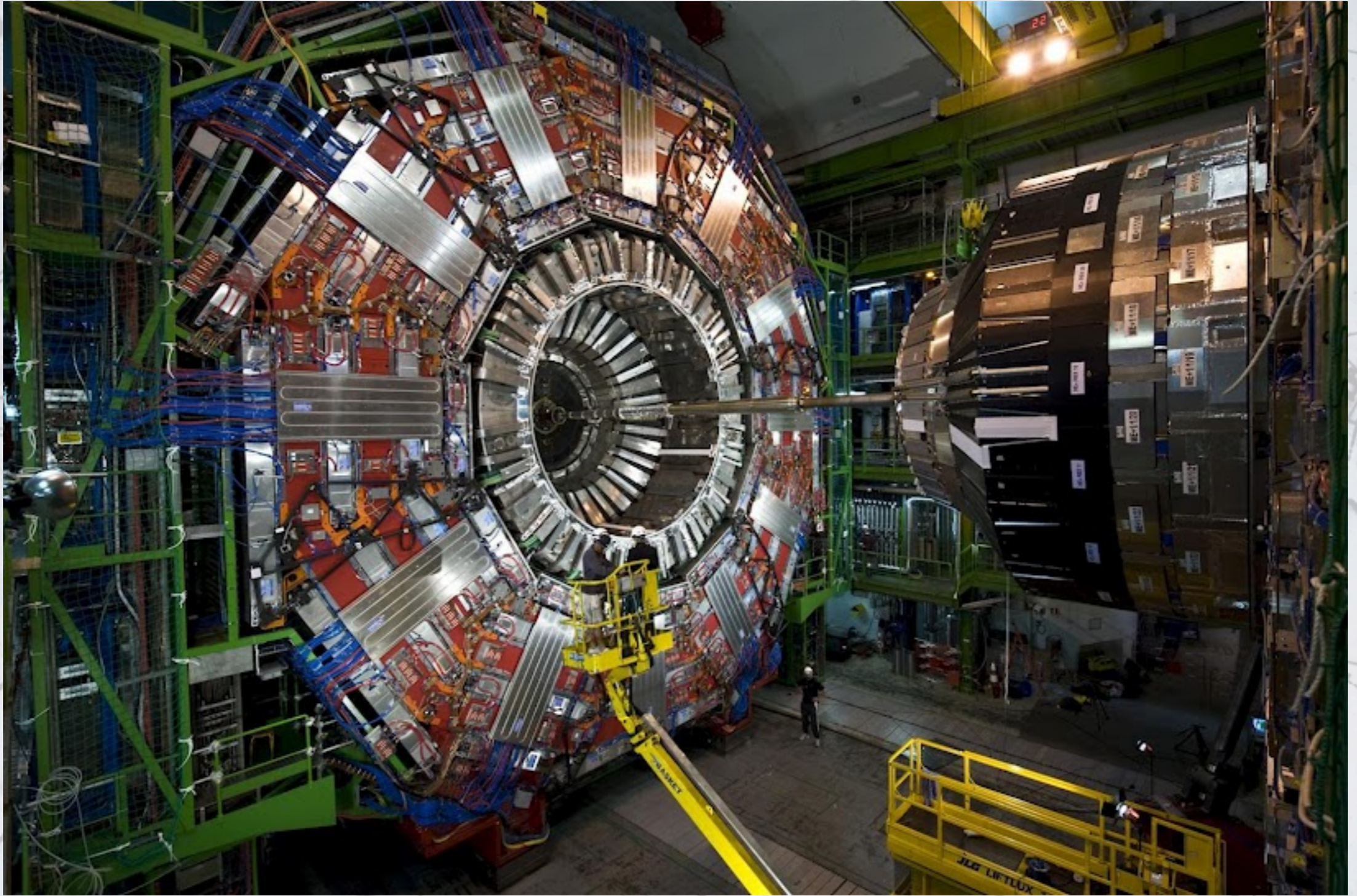
# UN RIVELATORE DI PARTICELLE



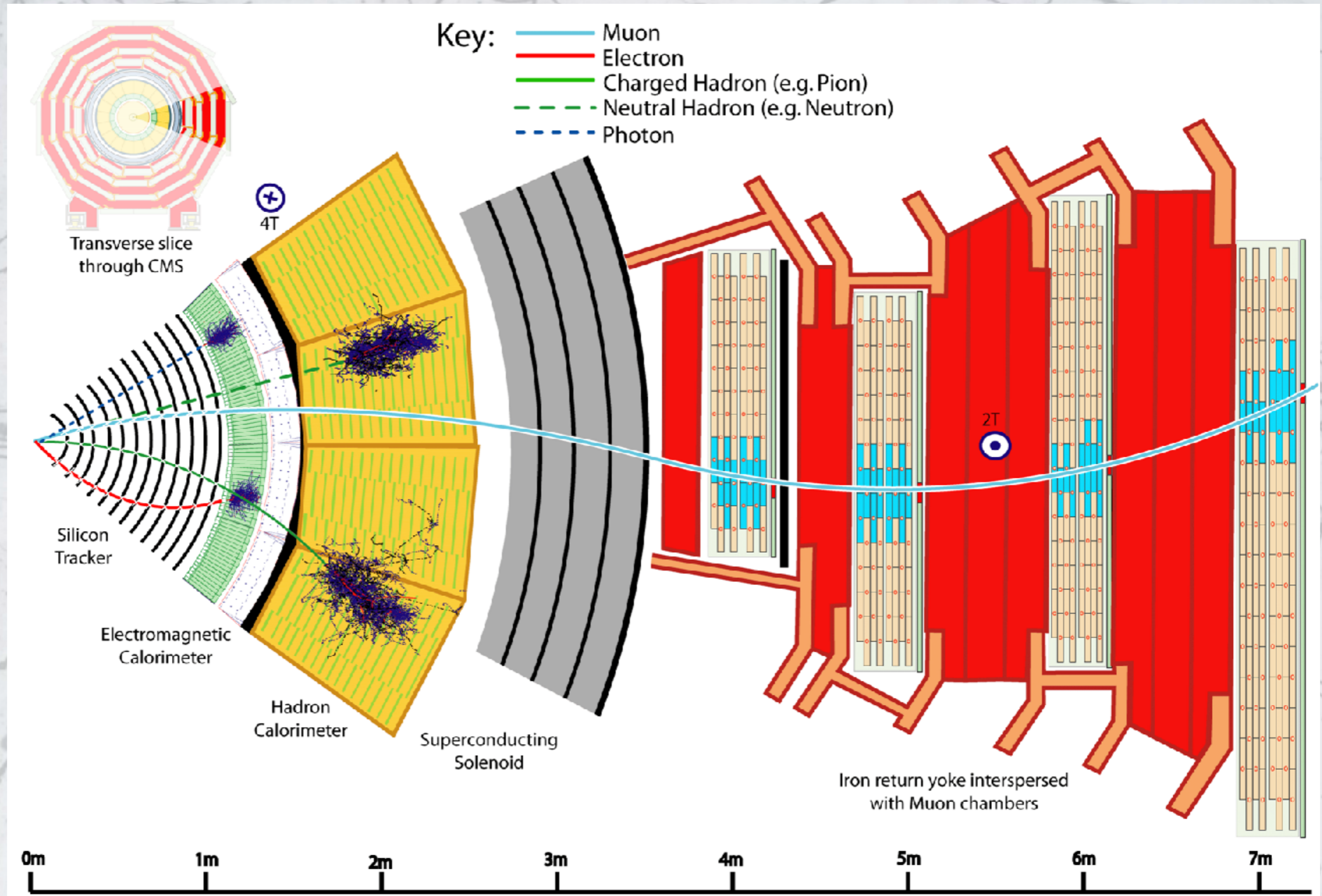
# UN RIVELATORE DI PARTICELLE



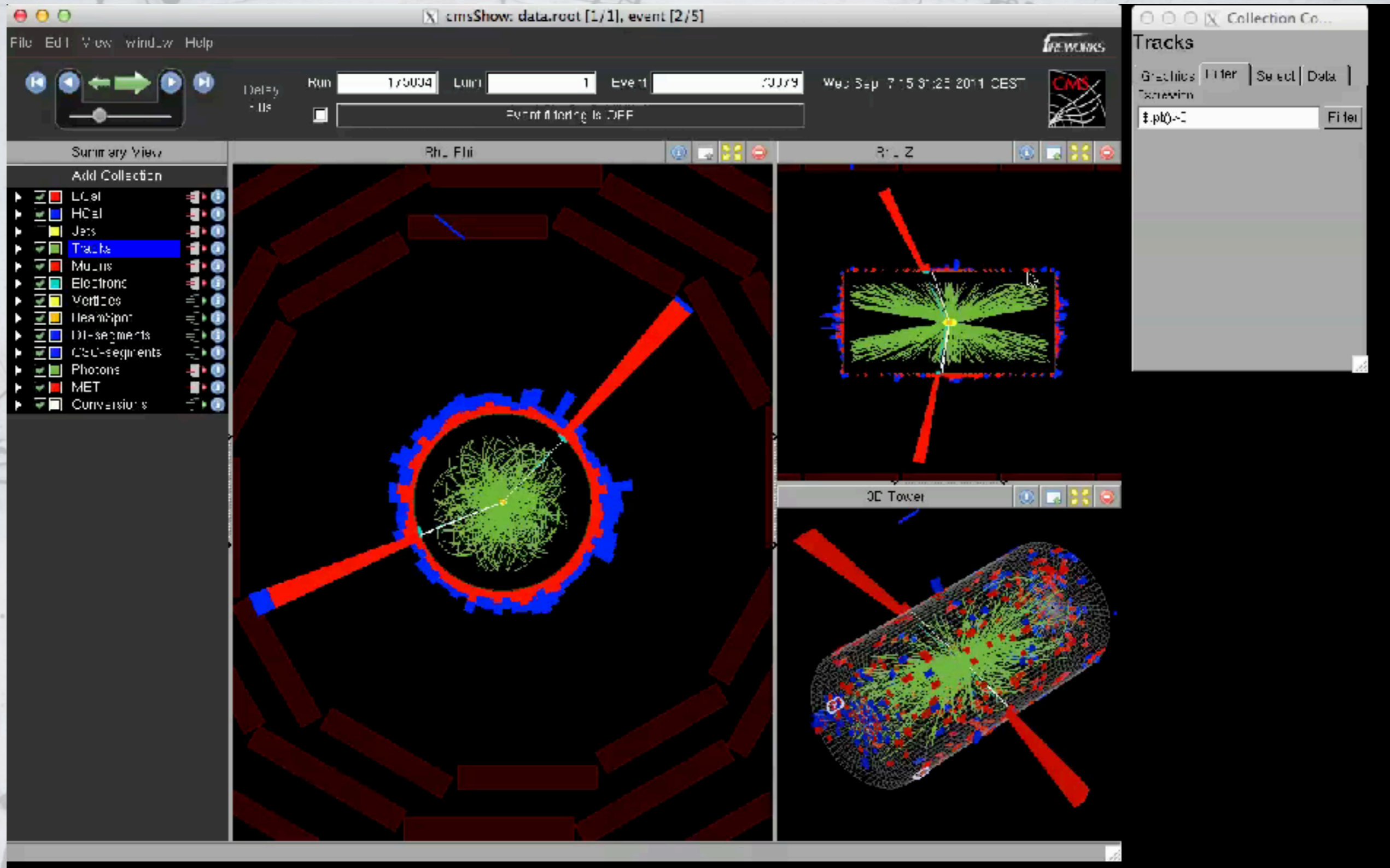




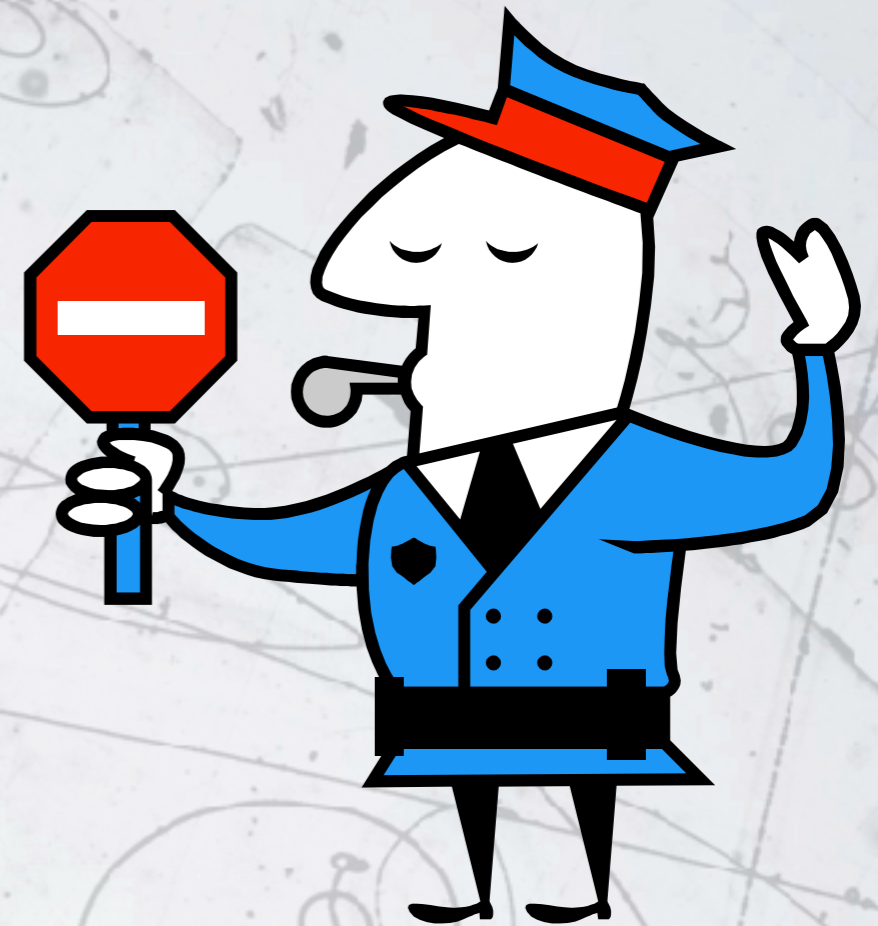
# UN RIVELATORE DI PARTICELLE



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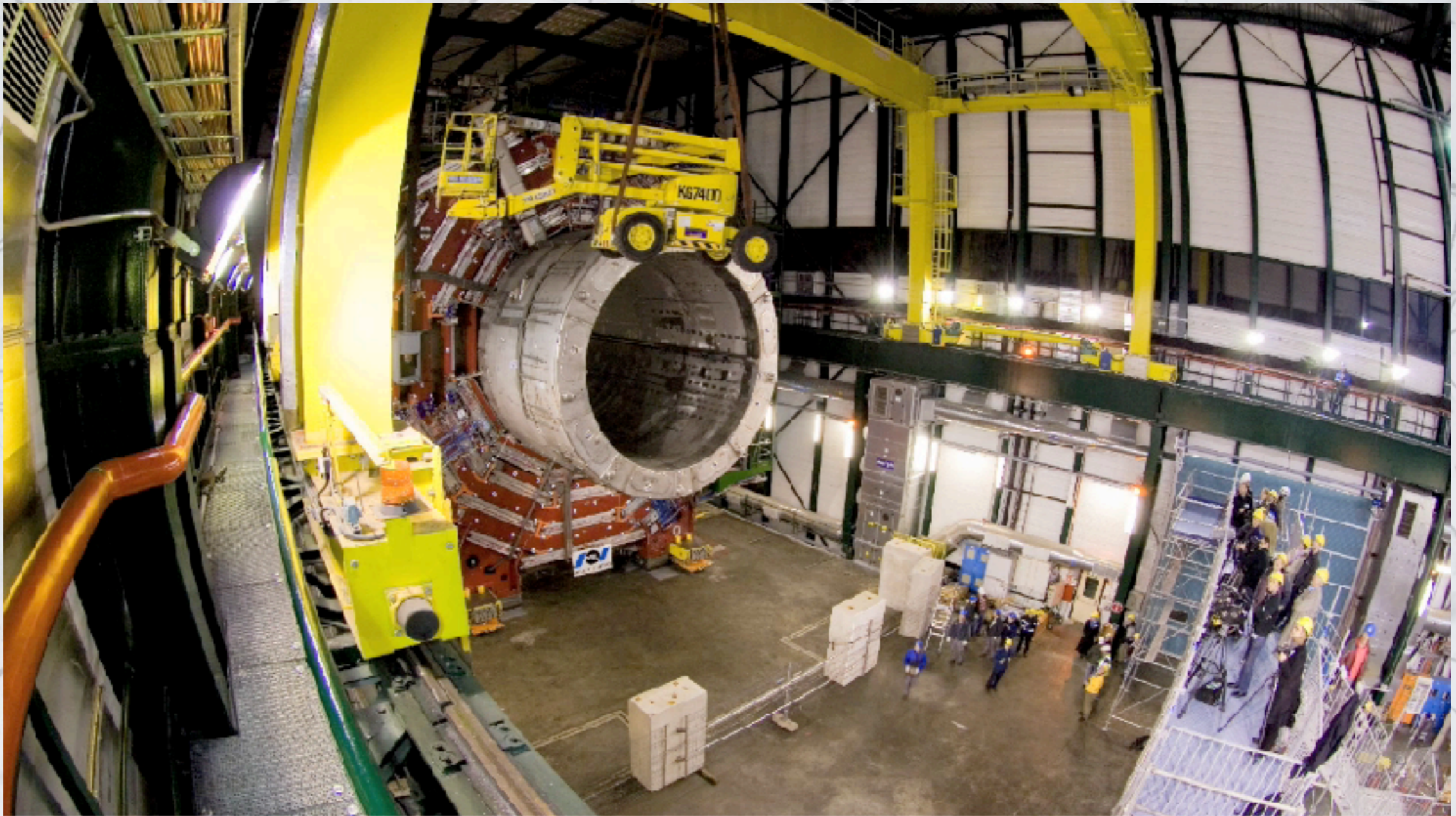
# LE DIMENSIONI DEI RIVELATORI



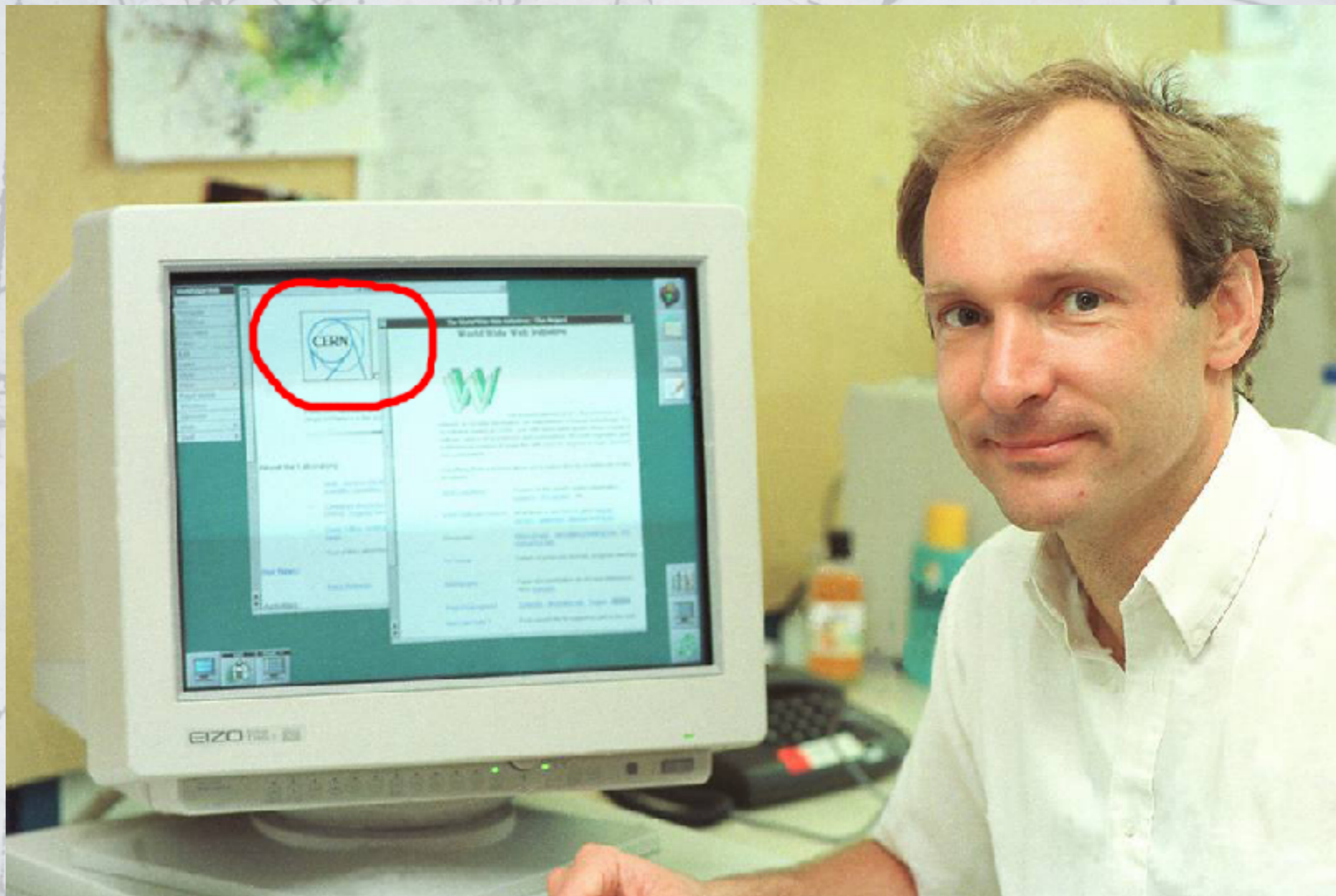
# NON SOLO PARTICELLE



# NON SOLO PARTICELLE



# EFFETTI COLLATERALI



# EFFETTI COLLATERALI



# L'IT virtuale che scegli, disegni e usi quando vuoi

Grazie ad Aruba Cloud Computing utilizzi finalmente le risorse che ti servono solo quando ti servono.



[Maggiori informazioni »](#)



## 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 virtuali, 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 »](#)

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#### 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