



Particles identification in the CMS experiment

HSSIP

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Anita Tarantino

Lecce

Liceo Scientifico Cosimo De Giorgi



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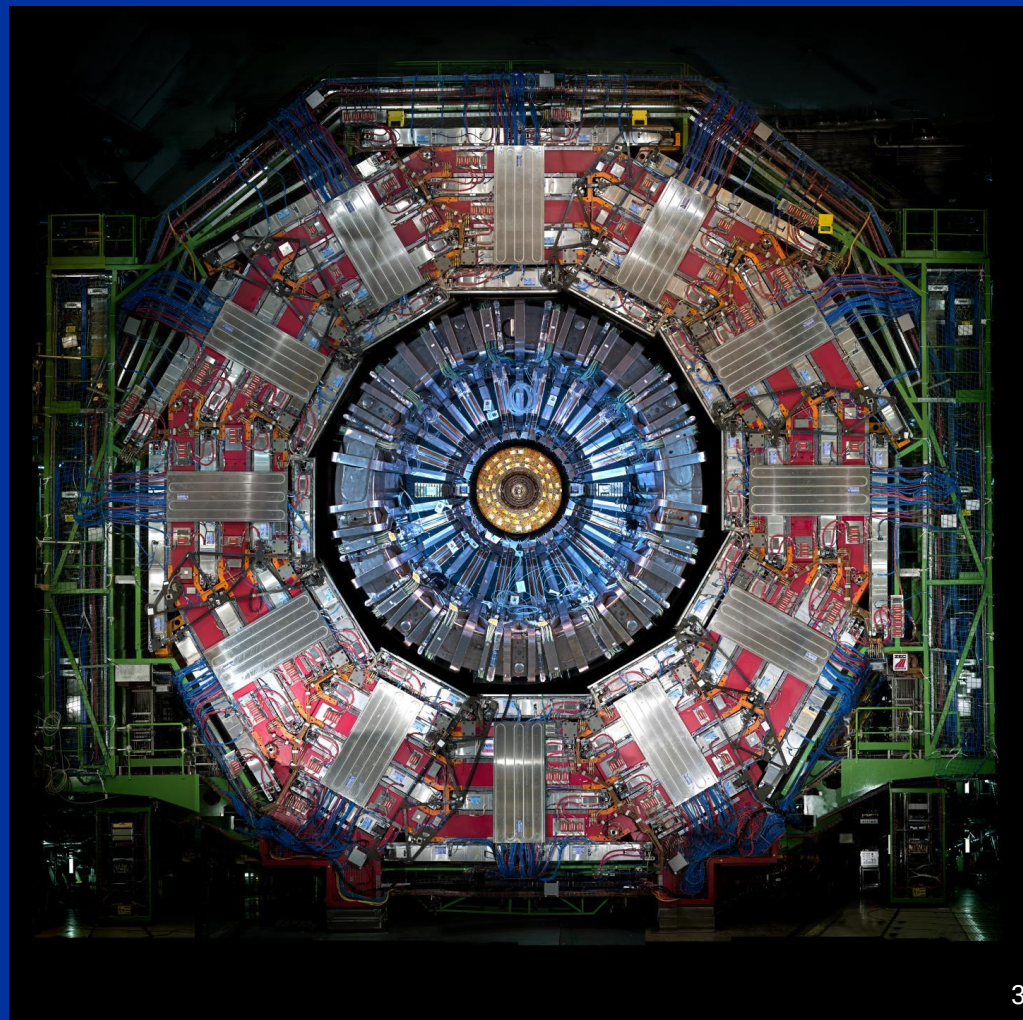
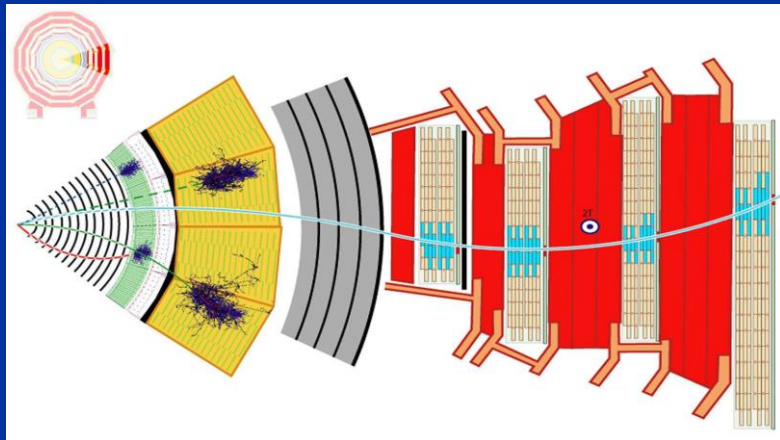
Firenze

Liceo Scientifico Antonio Gramsci



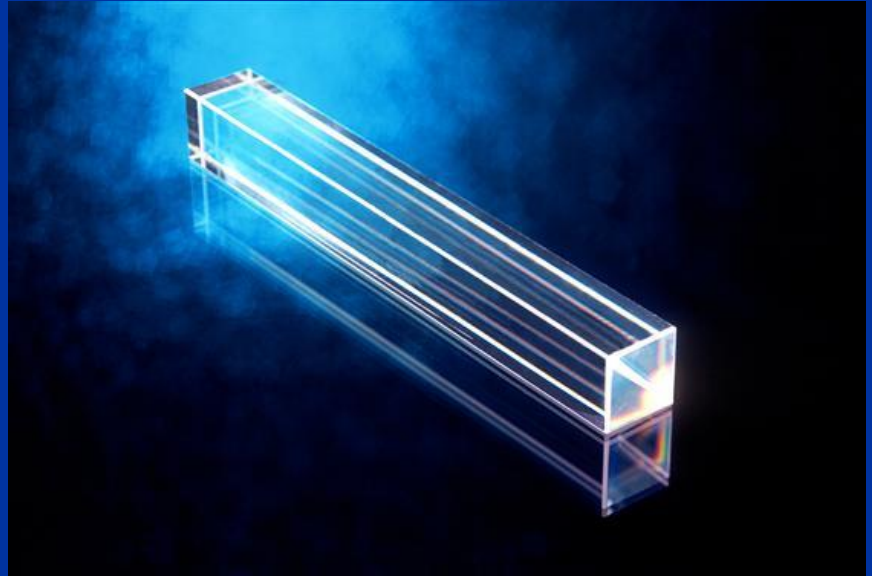
Our Project

CMS (Compact Muon Solenoid)



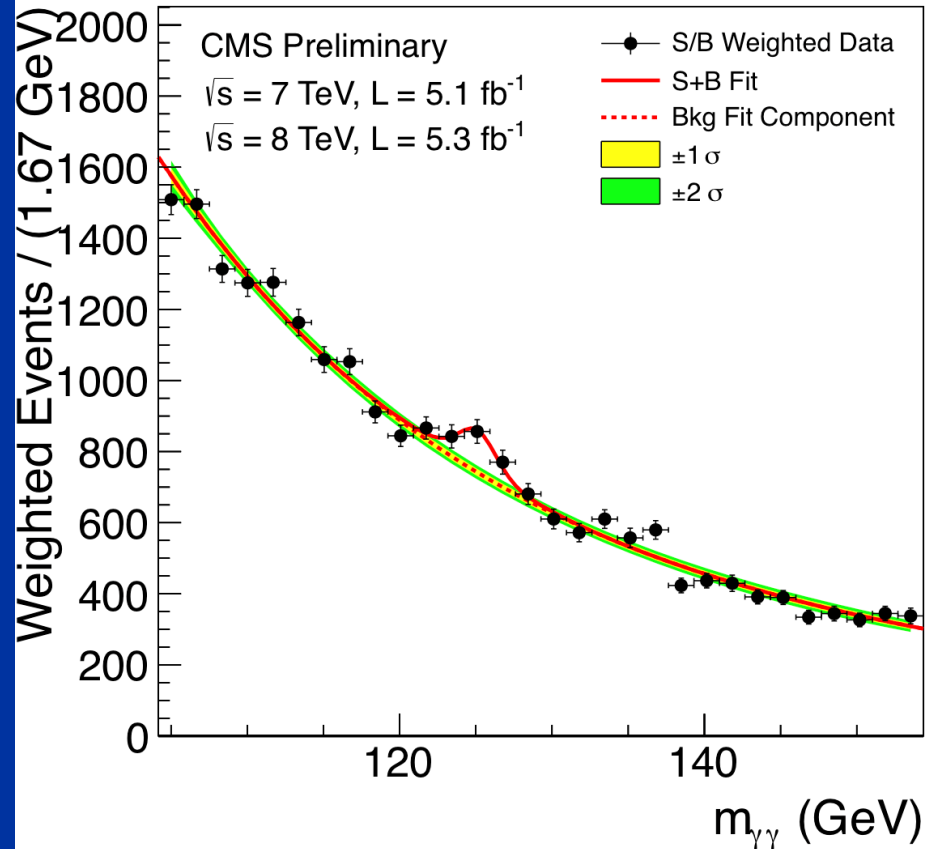
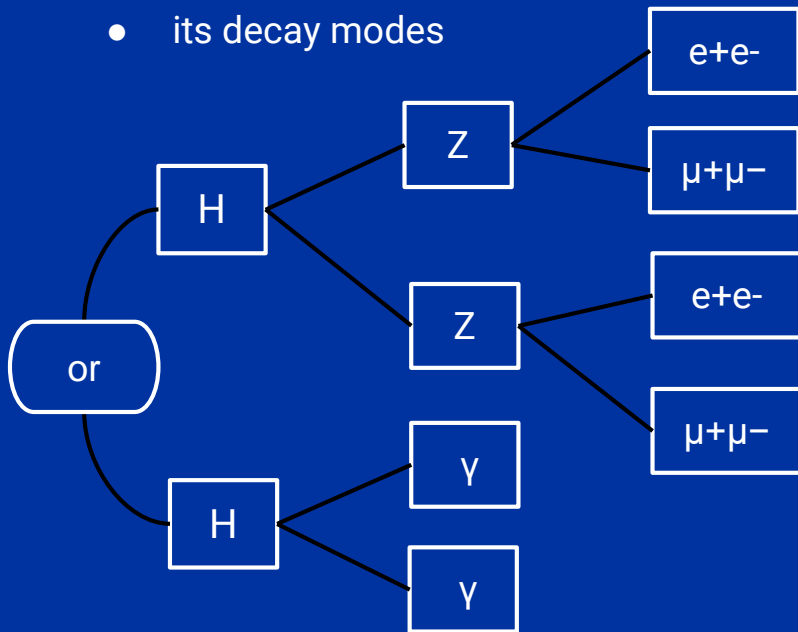
Electromagnetic Calorimeter in CMS

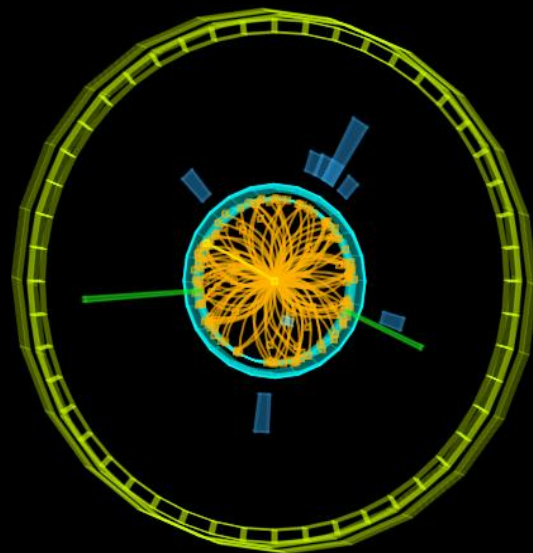
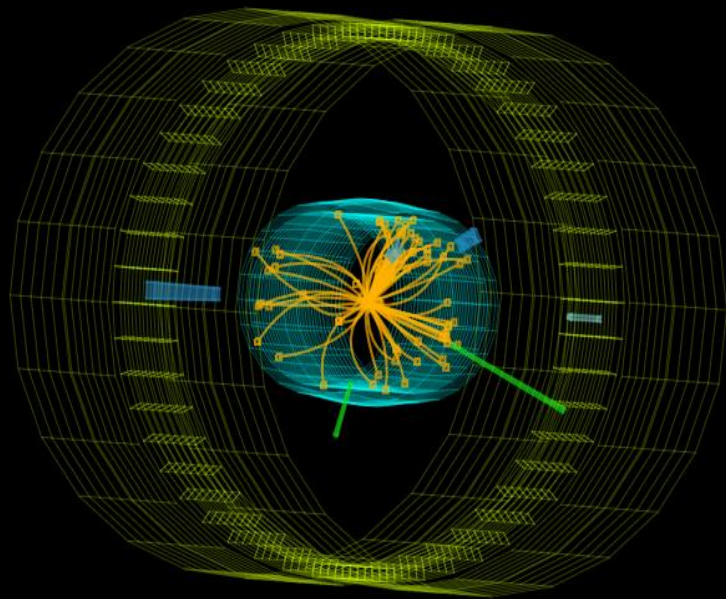
- A photons and electrons tracker
- Scintillating crystals
- was crucial in finding the Higgs boson



The rush to the Higgs

- How was it identified?
- Why a peak?
- its decay modes





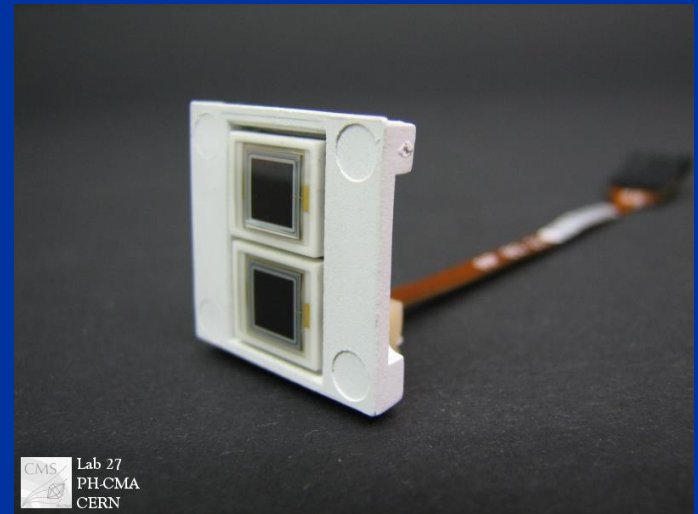
Why so difficult??

The necessity of stability

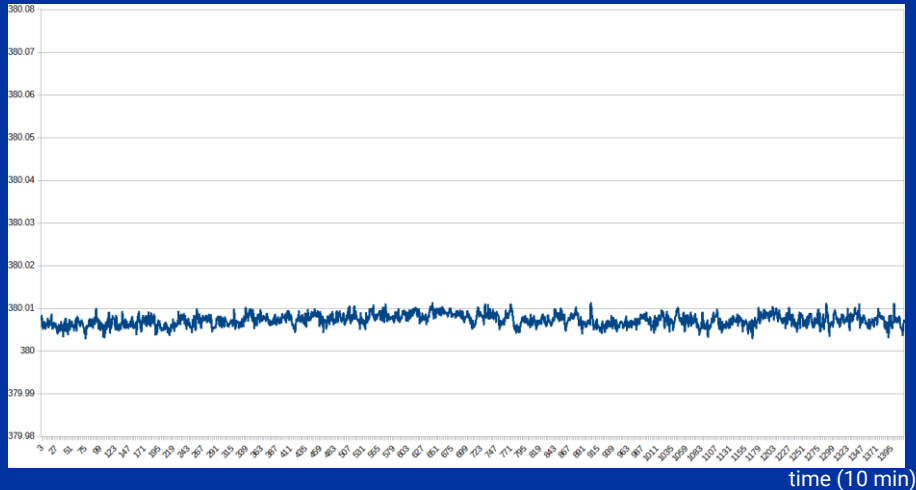


Problem of the high voltage

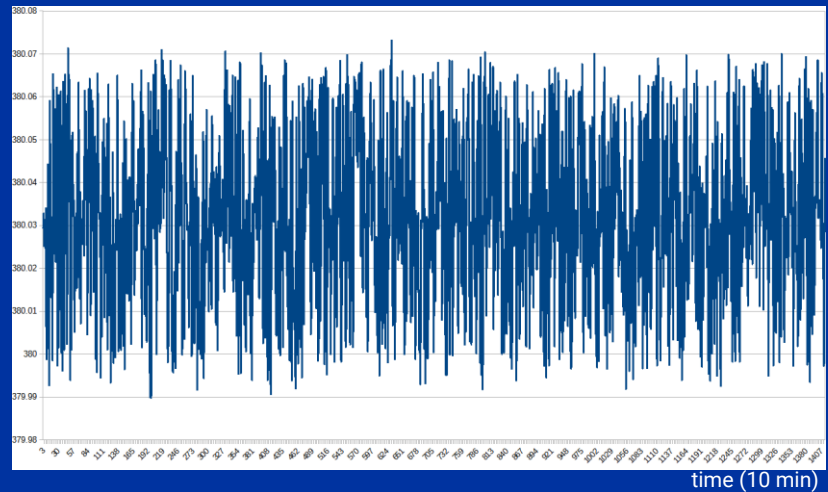
- $\Delta V < 60$ mV for every channel in a board
- the signal changes of 3% per Volt
- we need to check if they work

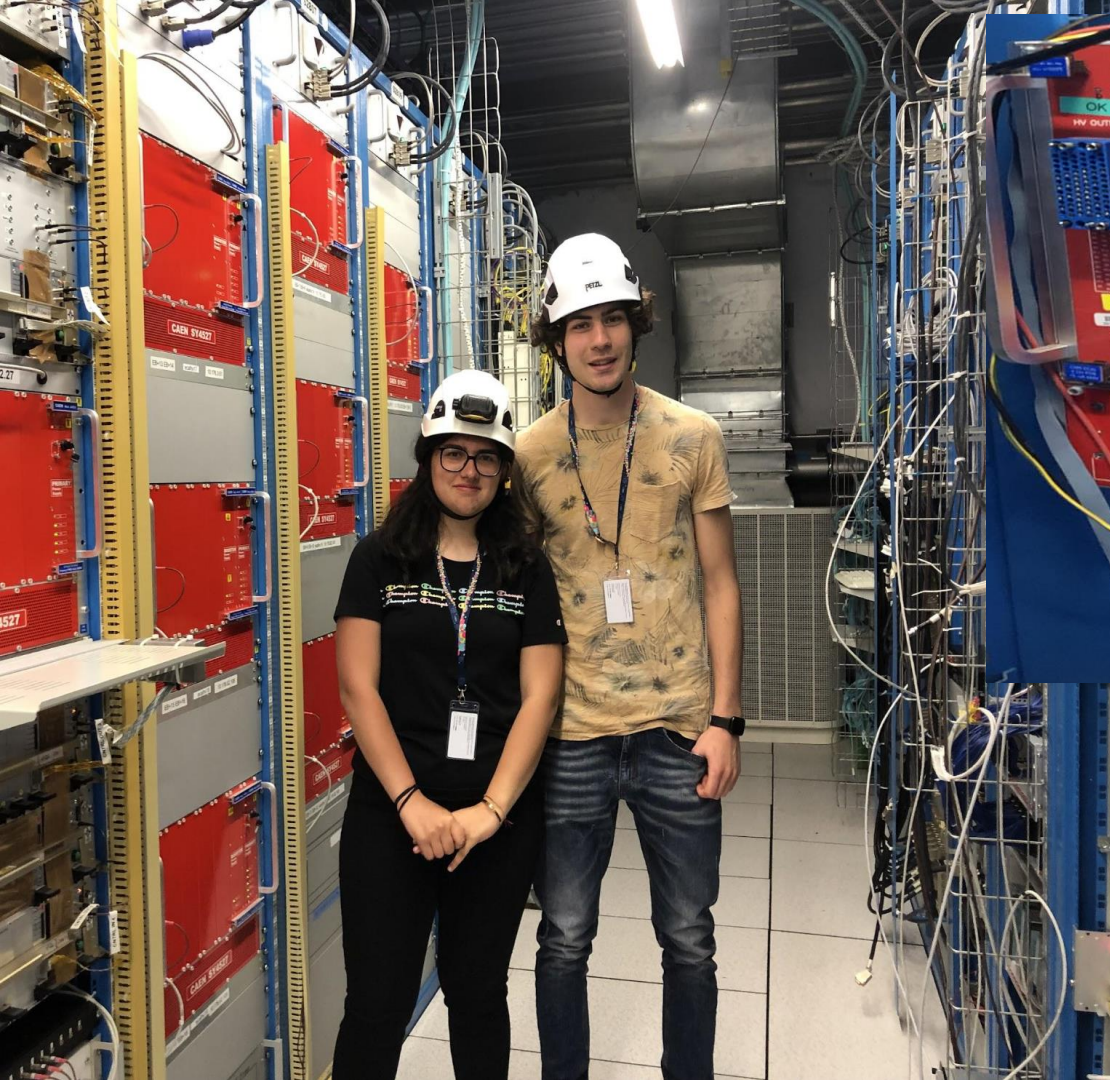


voltage (V)



voltage (V)

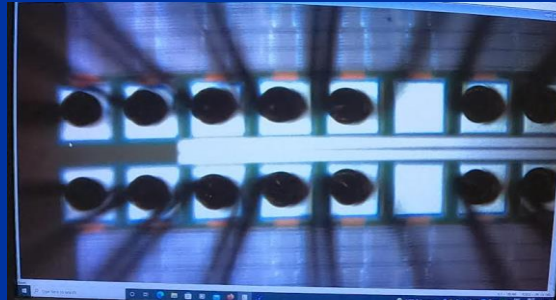




Different types of bonding for tracker detectors

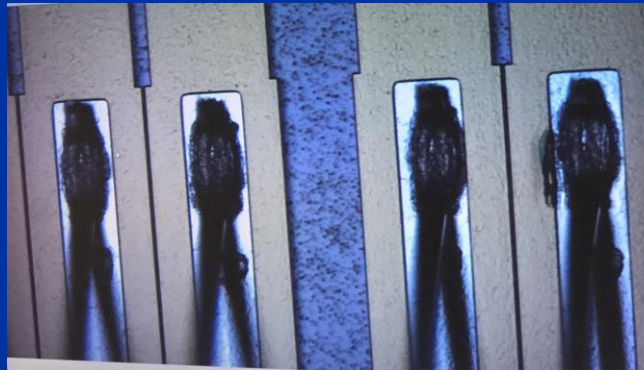
Gold ball

Gold wire bonding is achieved through **thermosonic bonding**. This involves melting the end of the wire to form a gold ball, which is known as a free-air ball.



Wedge wire

During wedge bonding, a **clamped piece of wire** is coupled under a bonding tool and a bond pad. Pressure and ultrasonic energy are applied for a given period of time forming a wedge bond.



Special thanks to

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CORRADO GARGIULO (AMS engineer)

And to all of you