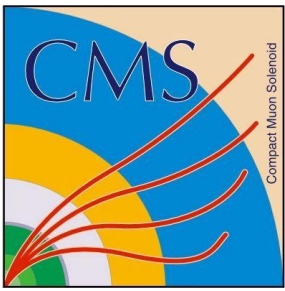




Specific long-term opportunities from CERN Detectors & Infrastructures

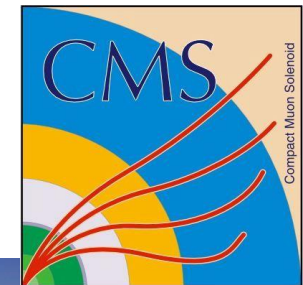
Andrea Gaddi & Nebojsa Smiljkovic / CERN Experimental Physics Department

Talk content



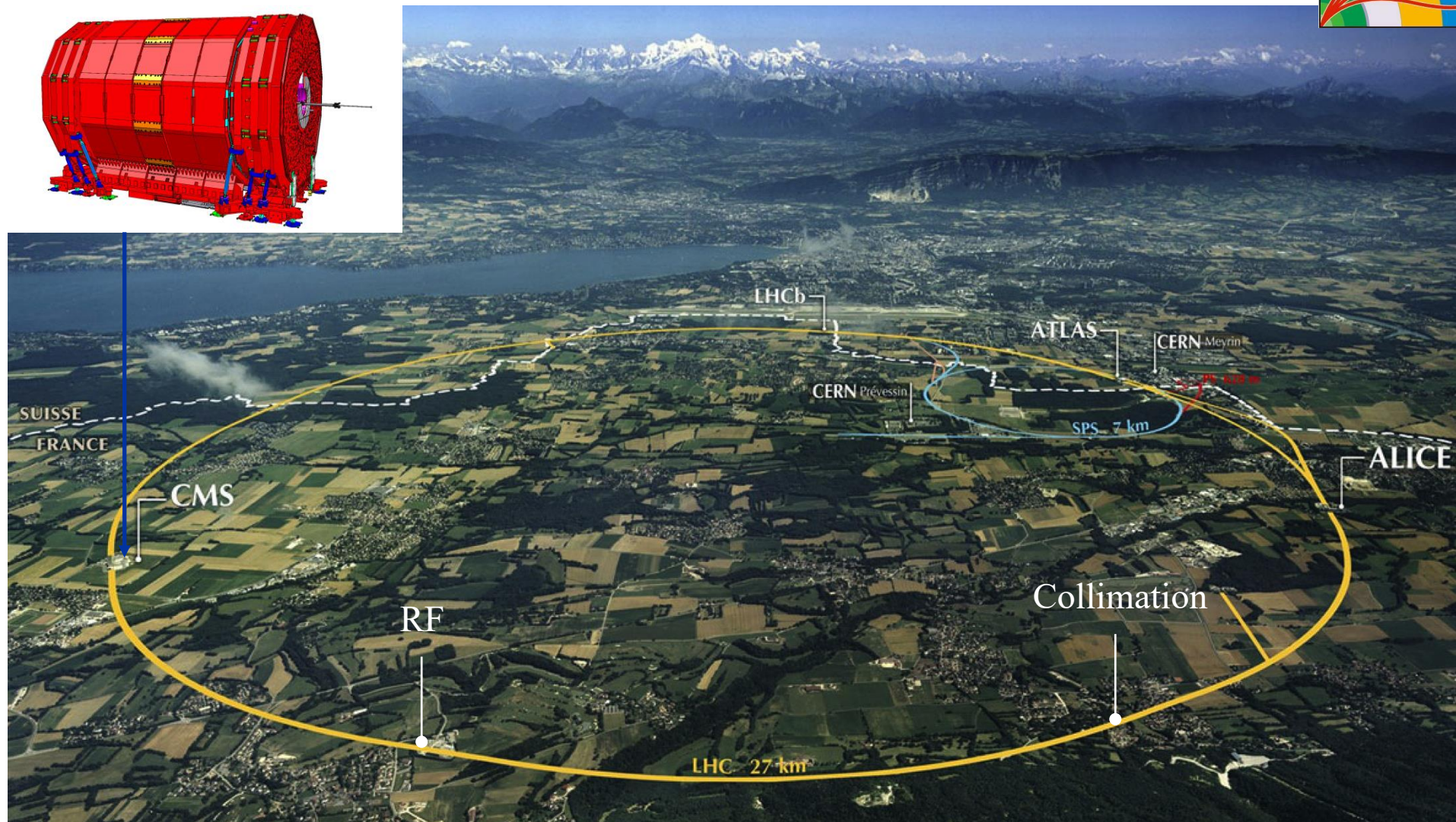
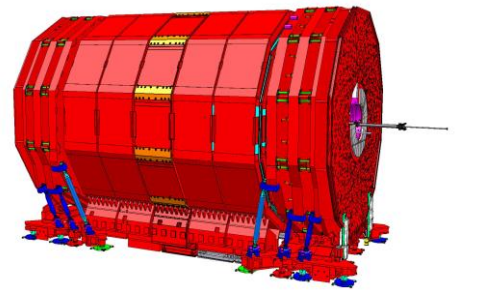
- 1. Introduction to CMS Detector**
- 2. CMS relationship with industry partners**
- 3. Detector Upgrade activities in the next 5 years:**
 - Detector specific services
 - CMS site general infrastructures
- 4. CERN site service contracts**
- 5. Example of successful collaboration in the past (YB0-bridge metallic structures, ...)**

Introduction to CMS Detector

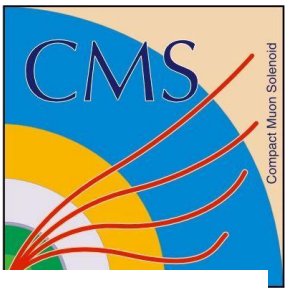


<https://cms.cern>

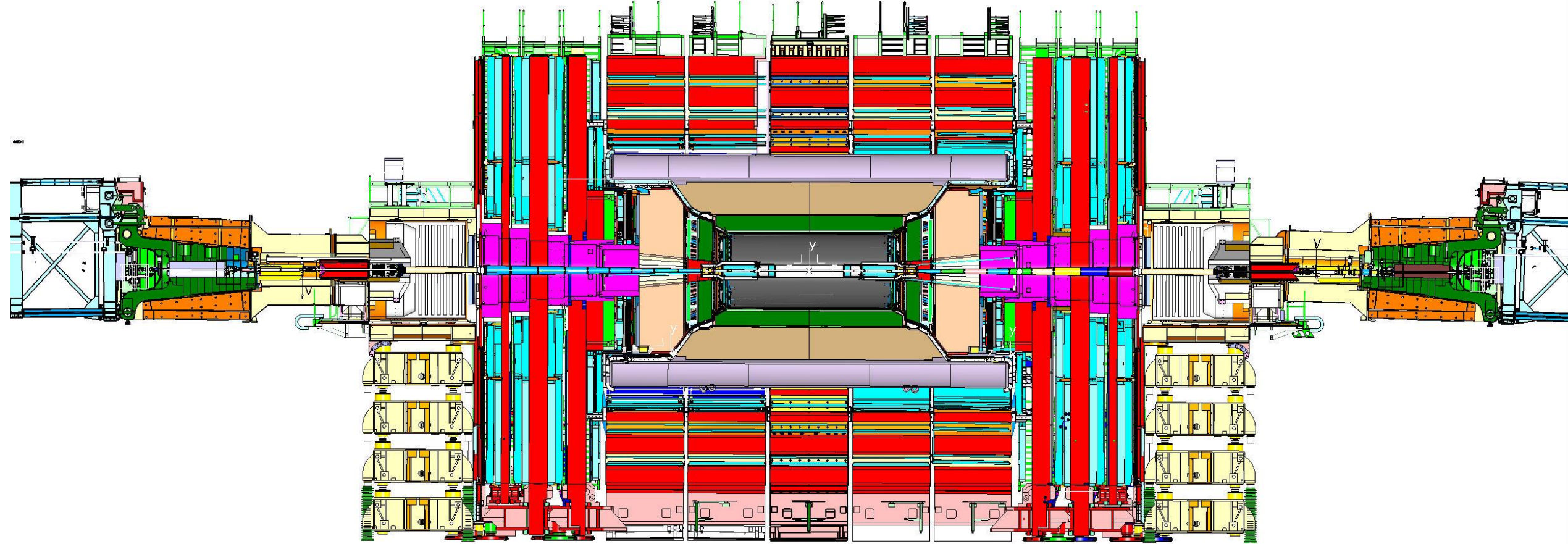
22 m length
15 m diameter
12,500 tons weight



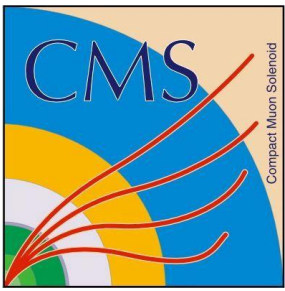
Introduction to CMS Detector



One of the largest High Energy Physics detector in the world.
Built between 2000 and 2008 by a collaboration of hundreds research Institutes in the world.
In operation from 2009 on the Large Hadron Collider at CERN, 100m below ground.



CMS relationship with industry partners



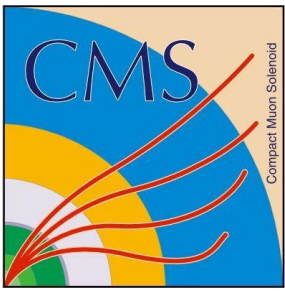
CMS is not a legal entity, by consequence it can buy goods and services only via Institutes of the collaboration or via CERN.

The procurement is generally done via the CERN Purchasing Service and CERN rules are applied, with some amendments to consider the source of the funds and the specificity of the requirements.

In-kind contribution from Institutes participating in the CMS collaboration are also common. In this case, the Institute in charge of the supply defines his own purchasing rules and domain for the tender.

CMS relationship with industry partners

<https://cms.cern/index.php/content/industry-awards>



Starting in 2000, the CMS Collaboration has honored industrial companies that have made outstanding contributions to the construction of the experiment with the CMS Industry Award.

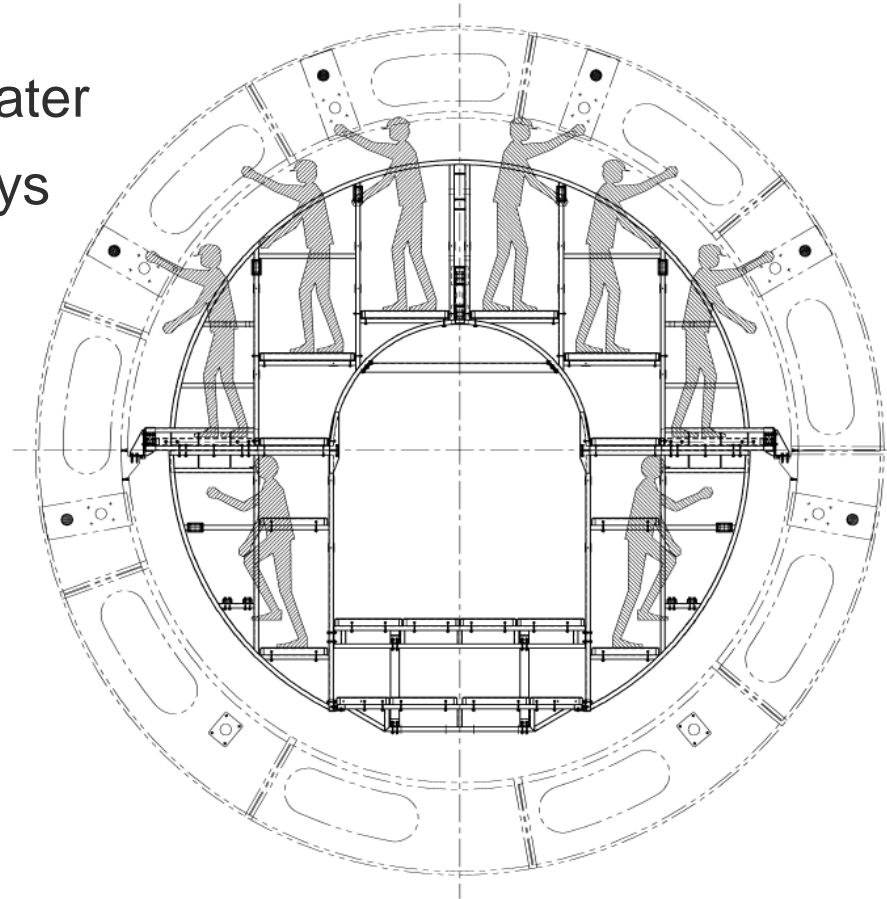
A hundred companies have received the award, among them Materion, Dell, IBM (USA), VSL, Nexans (CH), Hamamatsu, Kawasaki (JP), Ansaldo (IT), DWE (D), ZEC (PL), Koncar (CR)...



Detector upgrade activities in the next years

Detector specific services

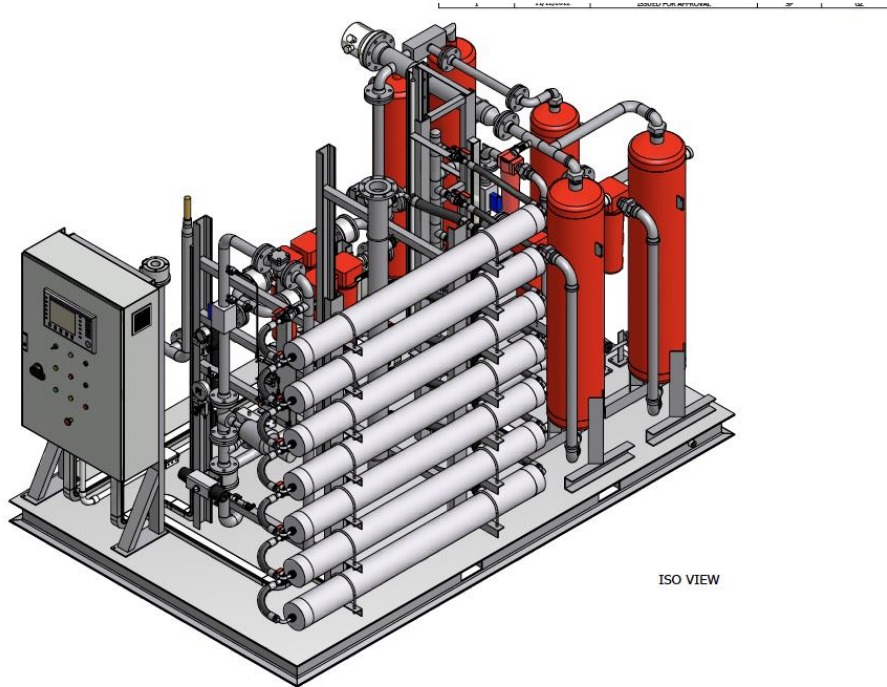
- scaffolds, aerial platforms, custom made lifting tools
- co-axial vacuum insulated piping
- industrial piping for gasses and water
- cables, fibres, cable ladders & trays



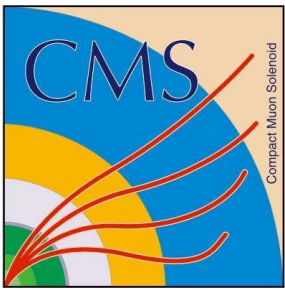
Detector upgrade activities in the next years

CMS site general infrastructures

- dry gas plant (hypoxic air)
- cooling & HVAC stations (chillers, fans, air handling units, ...)
- electrical power distribution equipment (transfos, switchboards, power supplies, ...)
- civil engineering (storage buildings)



CERN site service contracts opportunities



Just a few examples:

General piping service

Usually in the form of a “blanket purchase order”, meaning that CERN is engaged to buy material and/or service over a fixed period of time at pre-agreed costs.

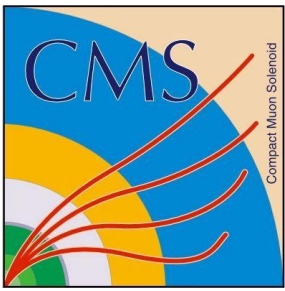
Site maintenance & cleaning services

5,000 people average on site every day, hundreds of buildings, some of them having 30+ years, needing renovation to comply with EN 50001 norm on Energy Management.

Site security service

Km of fenced boundary, across Switzerland and France border, plus hundreds of security cameras and many site access points.

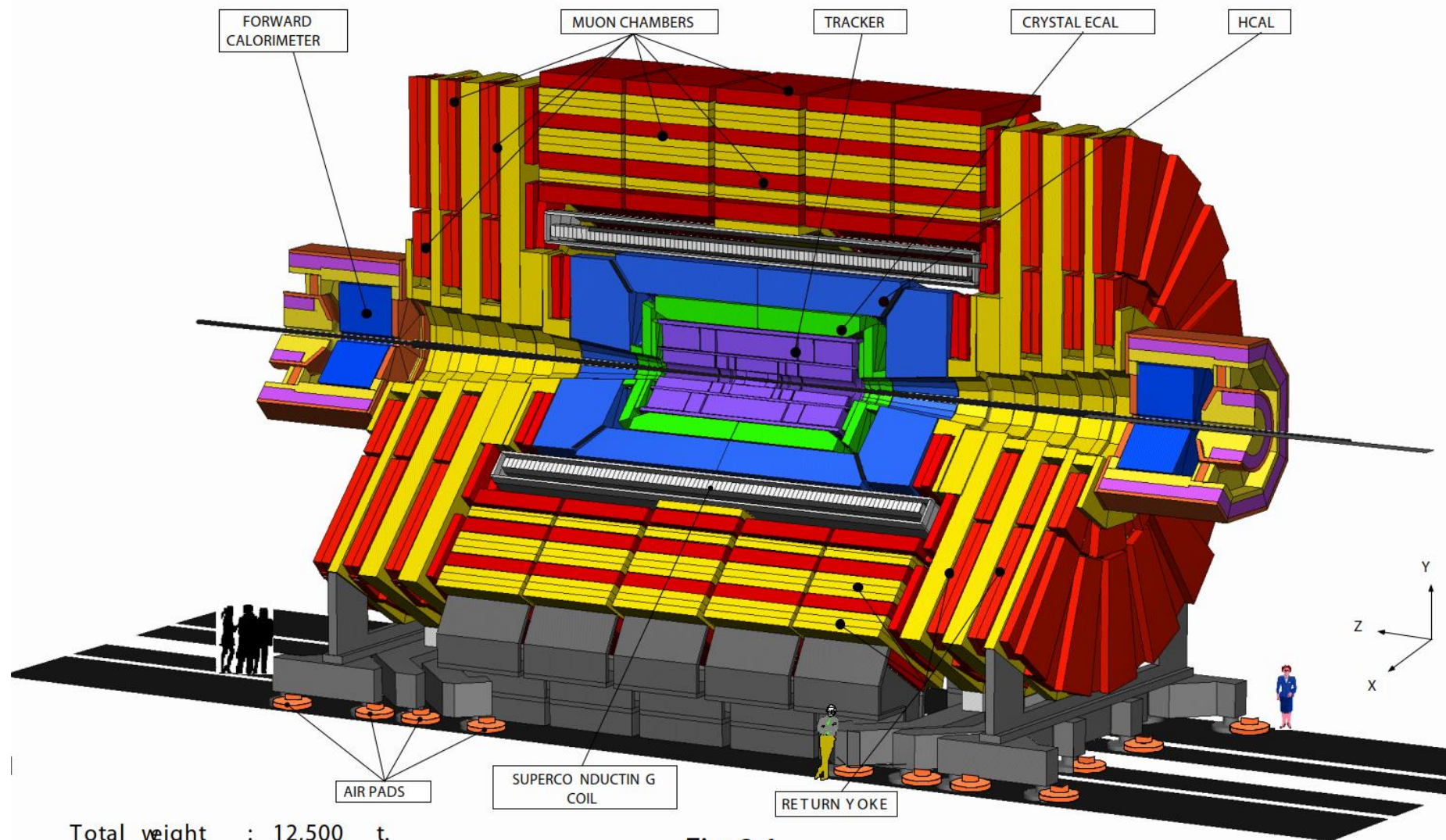
Examples of successful collaboration with industry



- **CMS Yoke Locking System (2001)**
- **CMS YB0 Access Bridge (2013)**

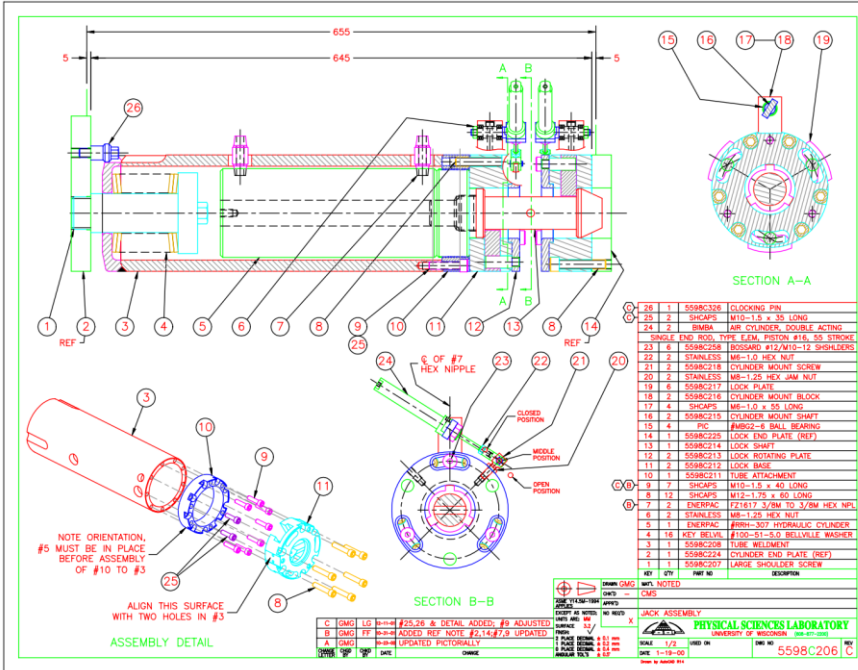
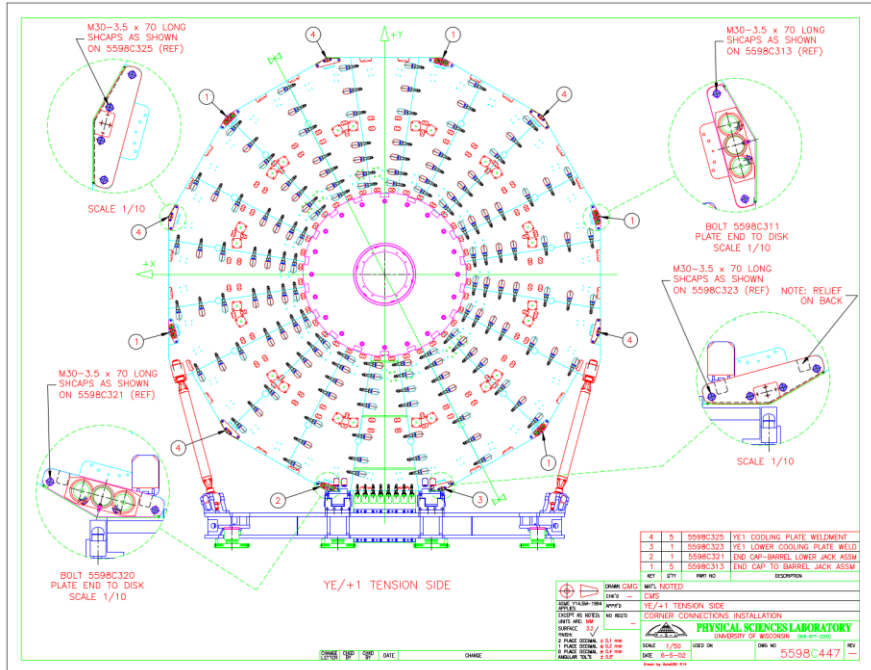
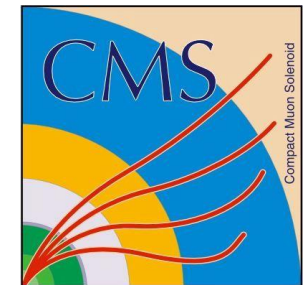
CMS

A Compact Solenoidal Detector for LHC



Total weight : 12,500 t.
Overall diameter : 15.00 m
Overall length : 21.60 m

Fig. 2.1
General view of the CMS experiment



Yoke Locking Systems (36 units)

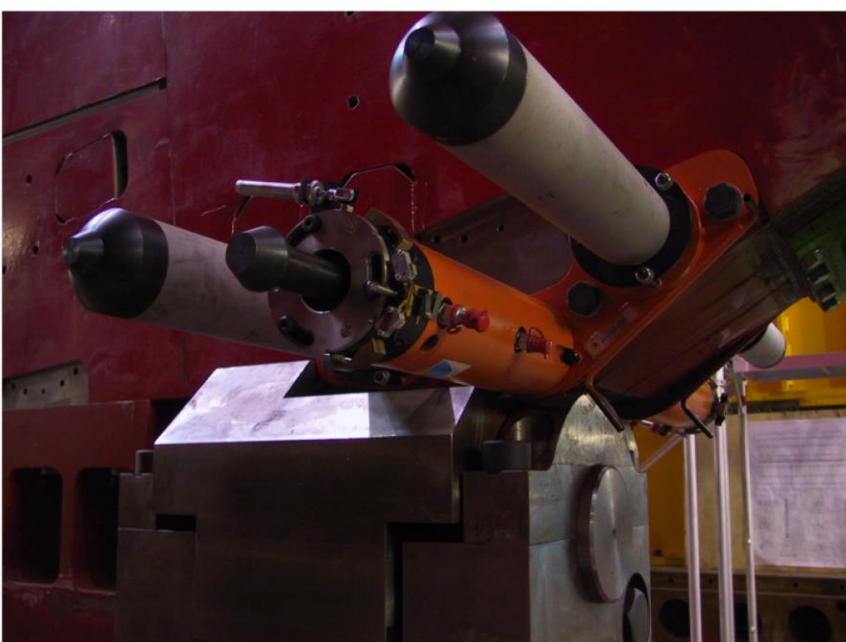
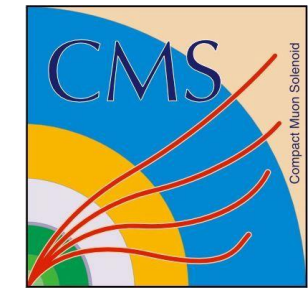
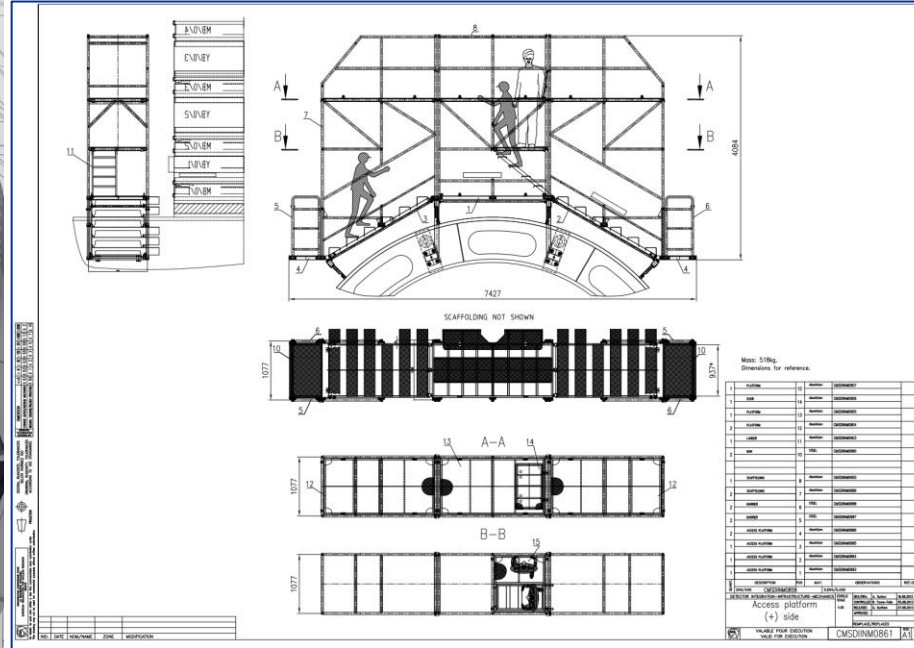
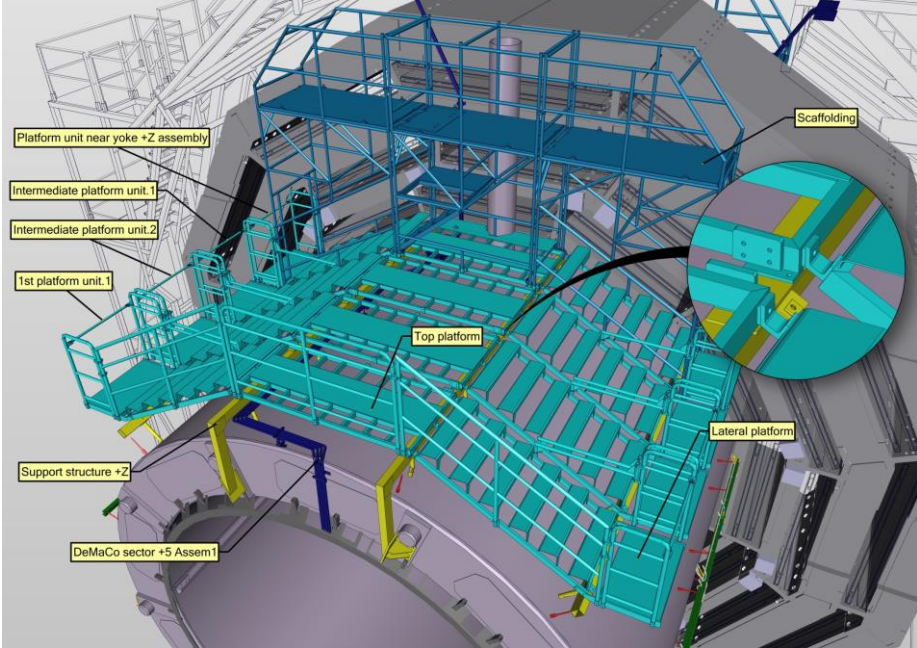


Fig.4 Picture of a Jacking Corner Piece between barrel rings

Zastava Alati-UNIOR, Kragujevac
Serbia
Fabrication

Fig.6_Picture_Endcap_Corner

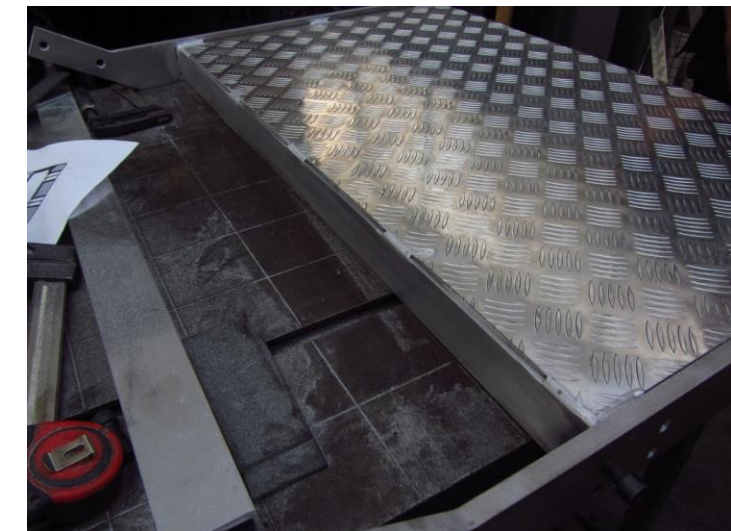




YB0 Access Bridge

GM Converting,
Gornji Milanovac, Serbia
Fabrication

CERN-CMS Engineering and Integration Centre 3D Modelling and production documentations



YB0 Bridge fabrication – Photos from Laurent Deparis' visit

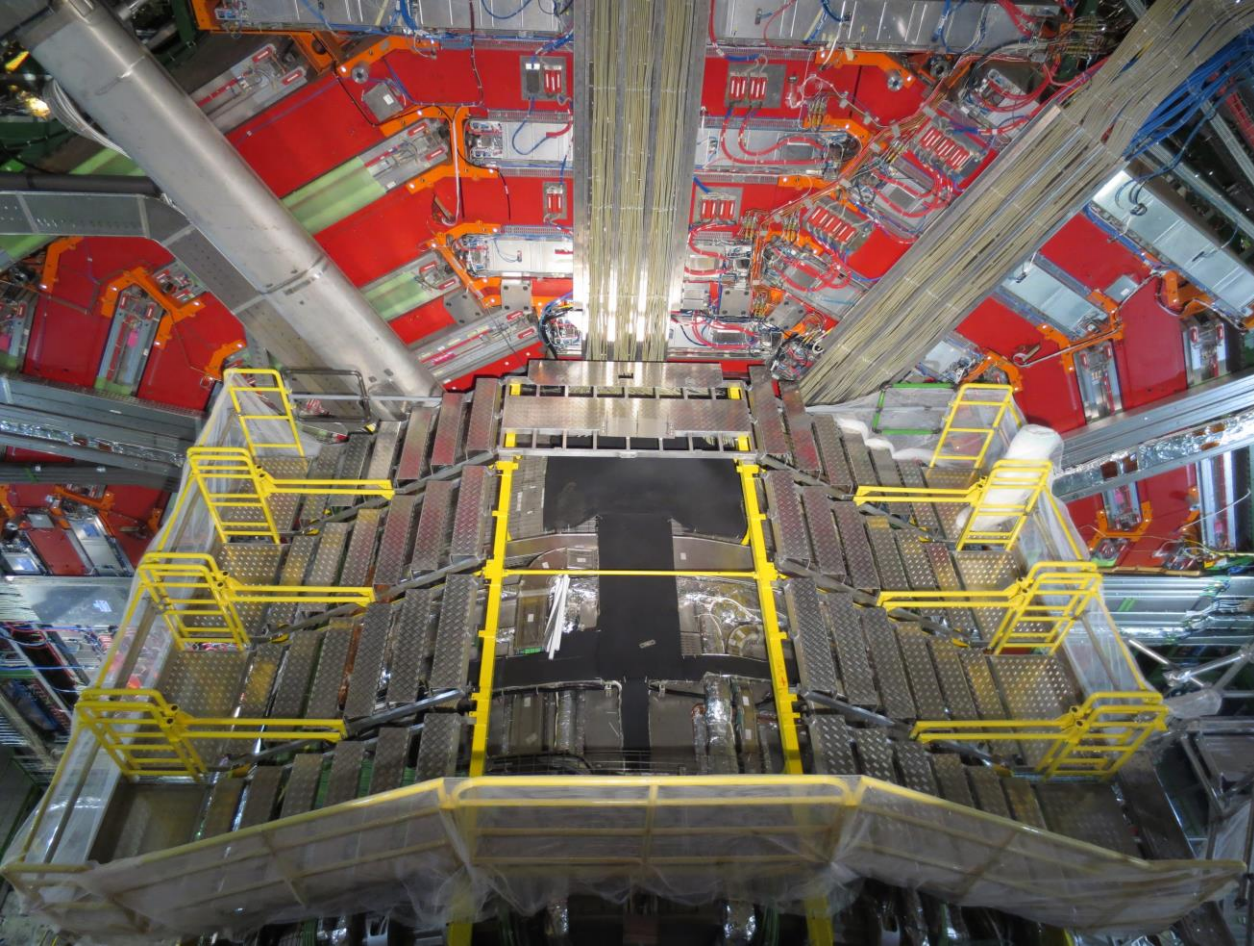
Analyse welding on one of the platform

Finished platform

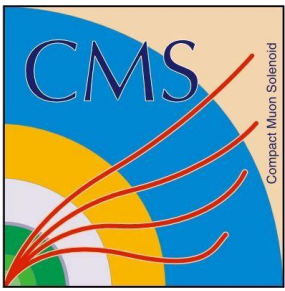


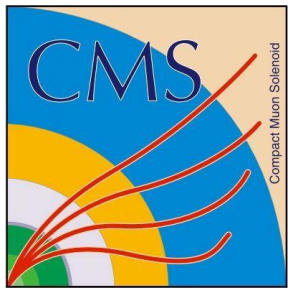
YB0 Access Bridge

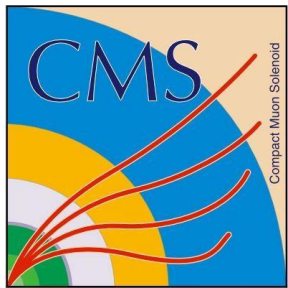
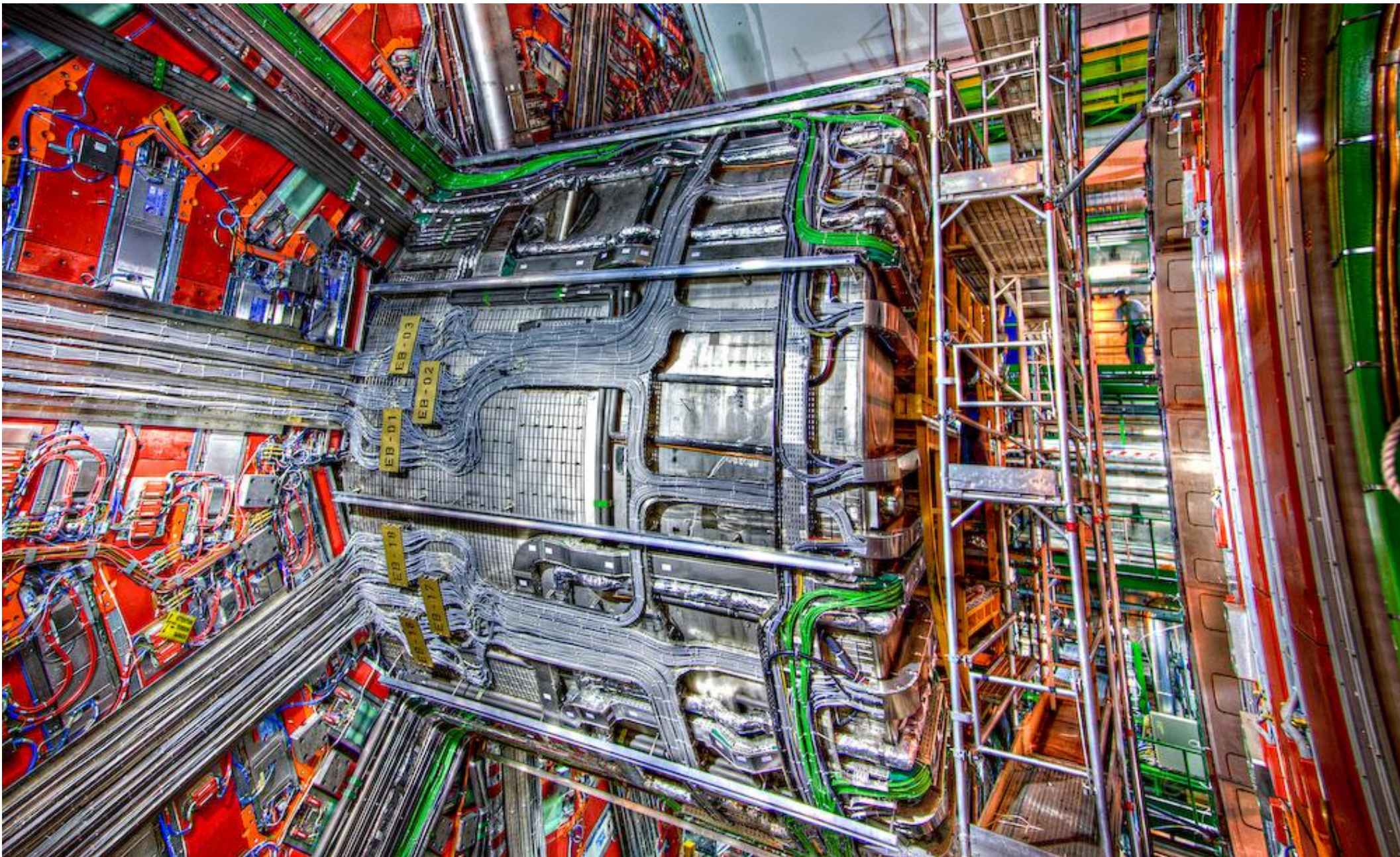
CMS Experimental cavern



Spare slides









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