

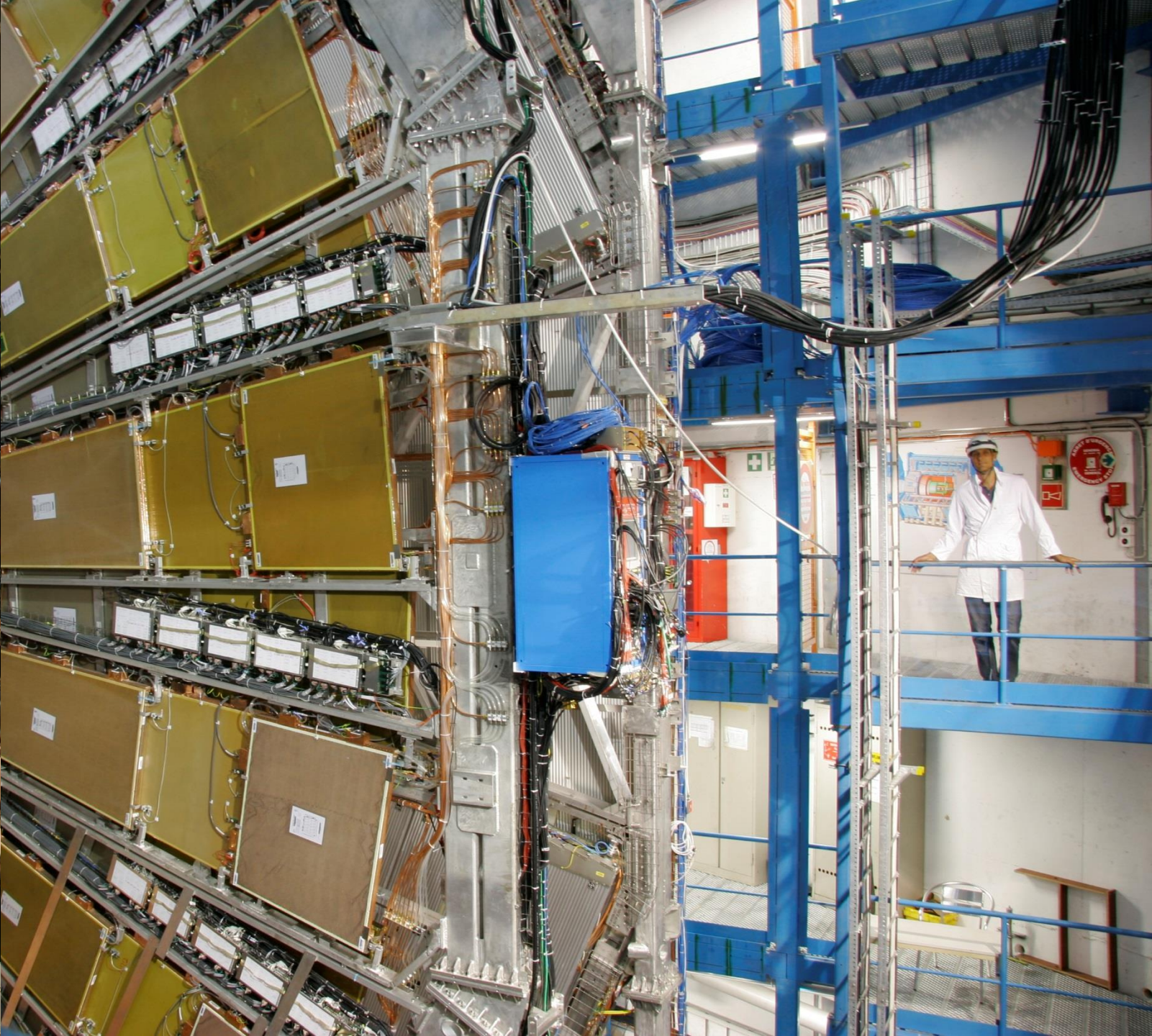


art@CMS

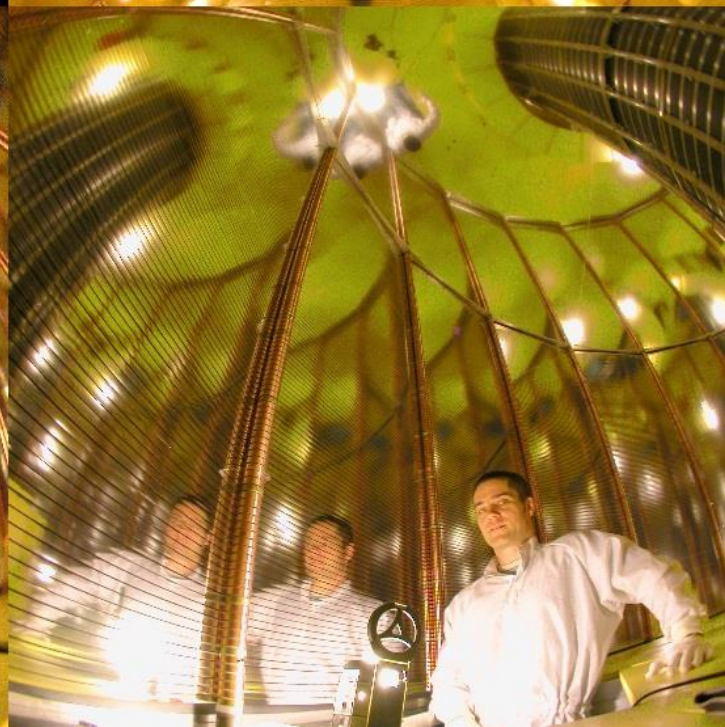
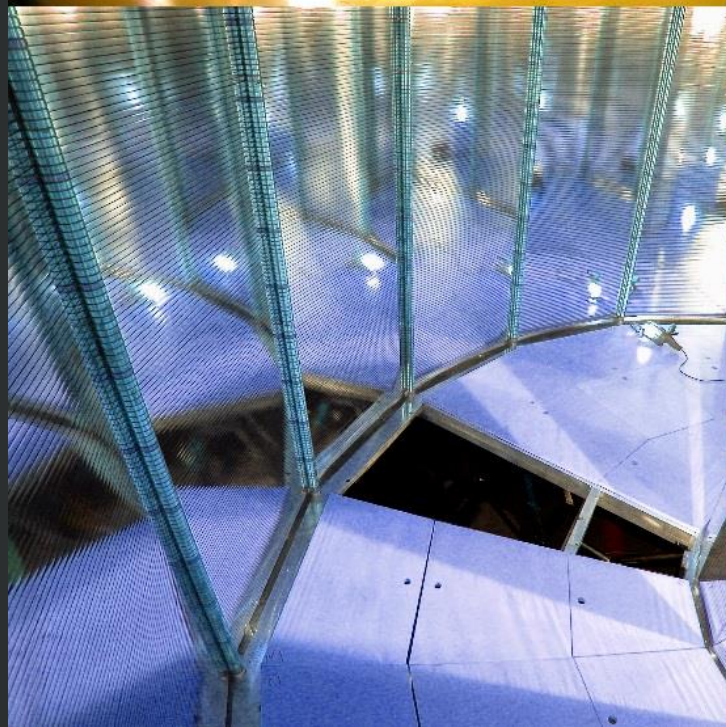
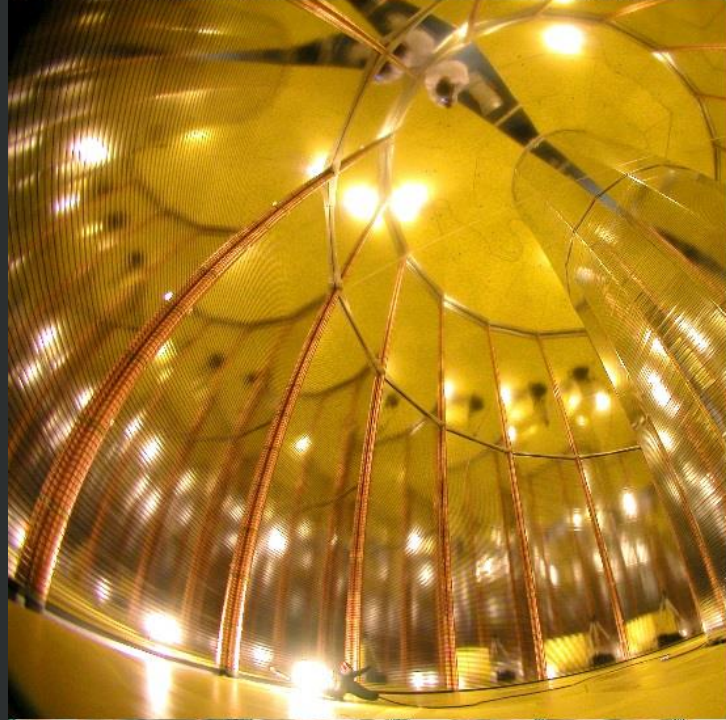
Science & Art  
University Collaborations

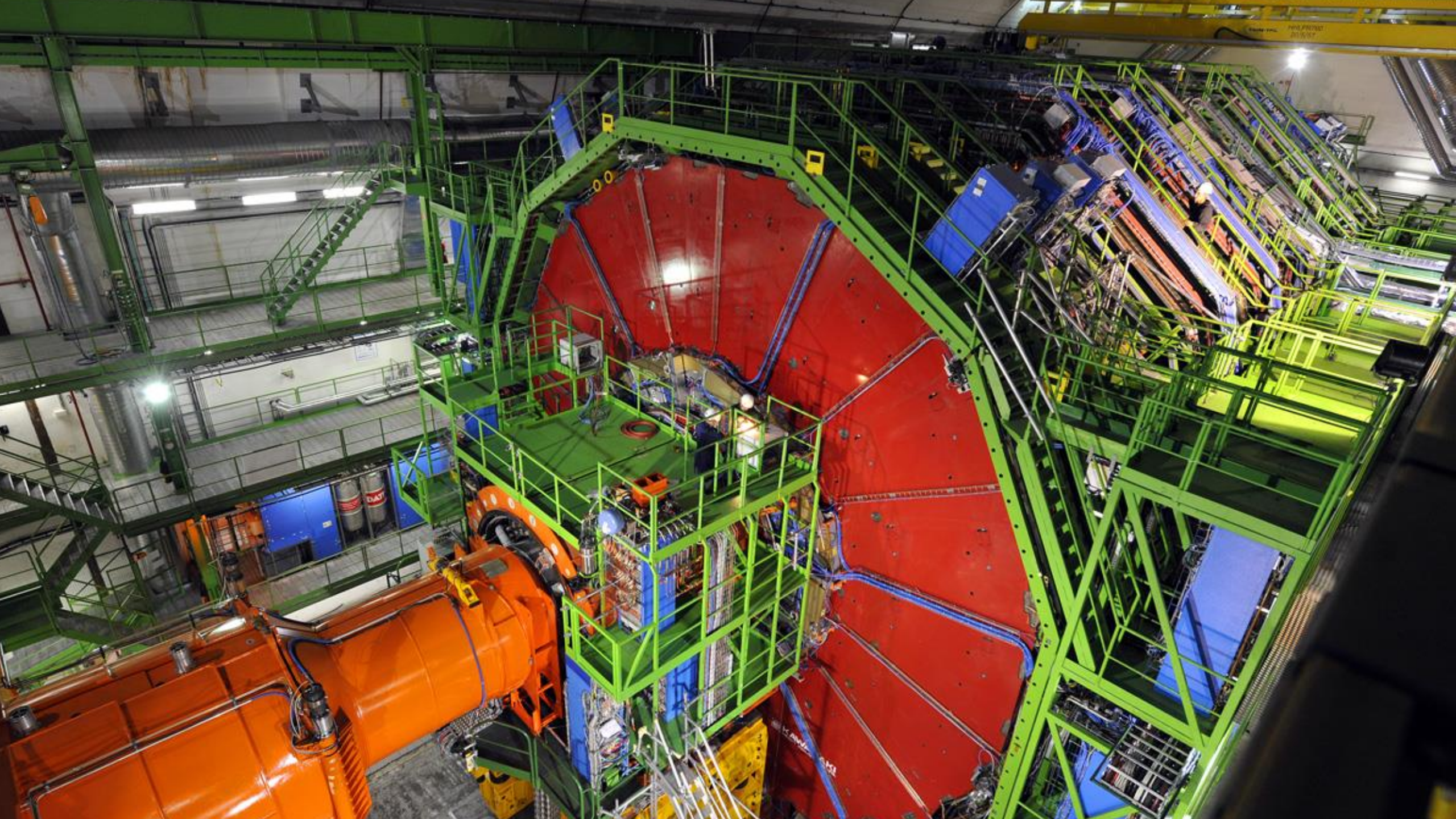
[Michael.Hoch@cern.ch](mailto:Michael.Hoch@cern.ch)

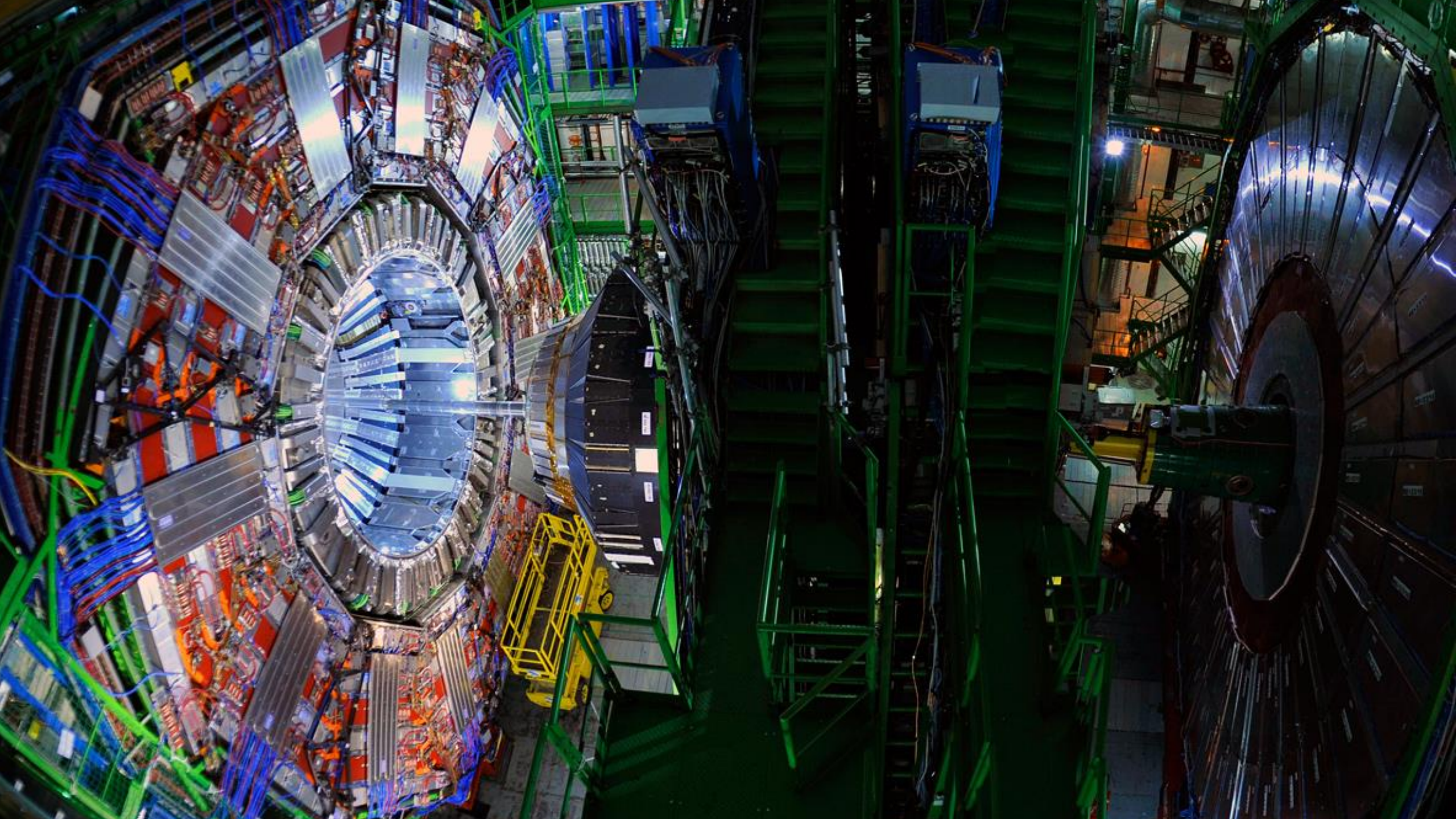
December 12<sup>th</sup> University of Montenegro

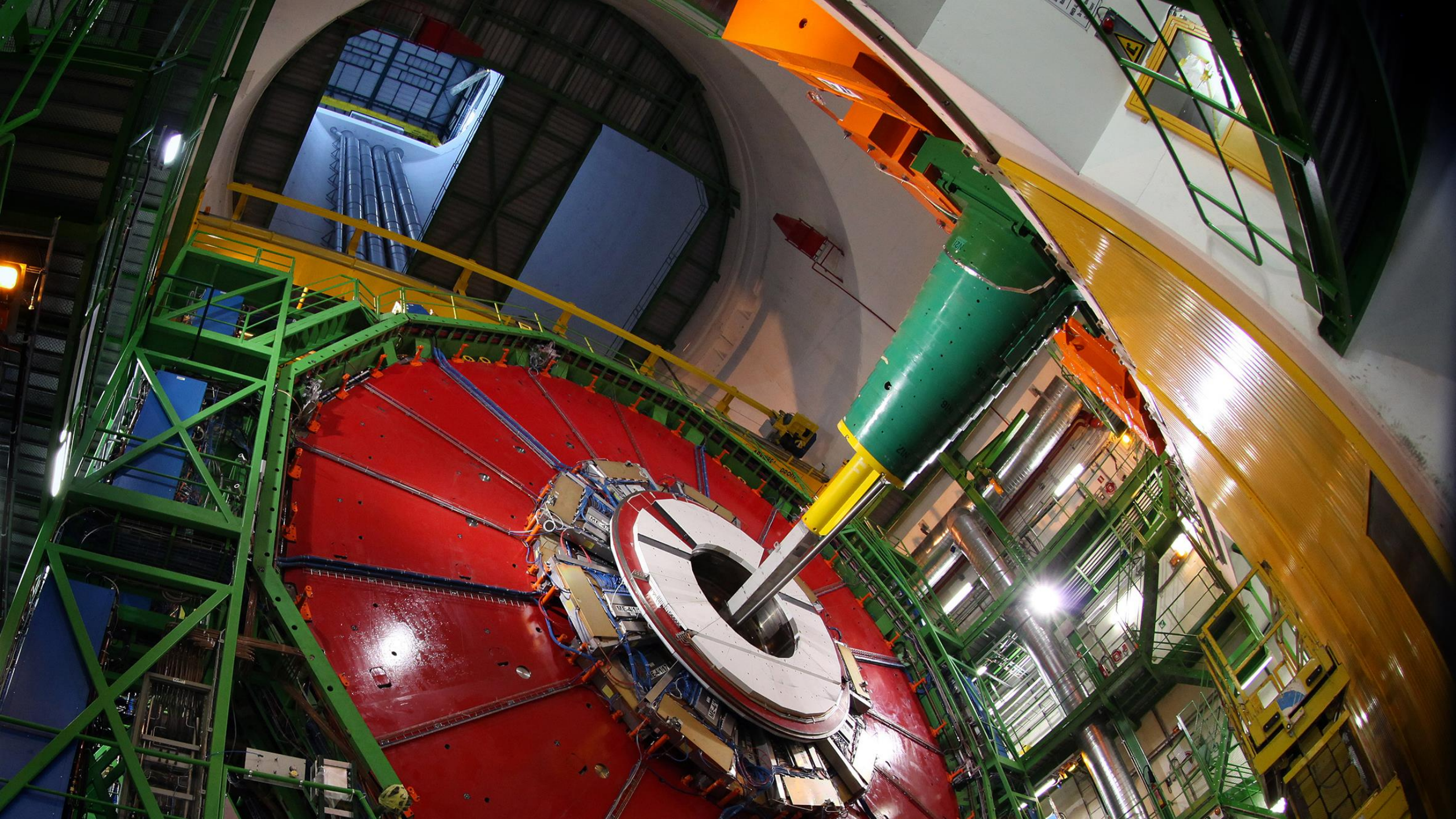


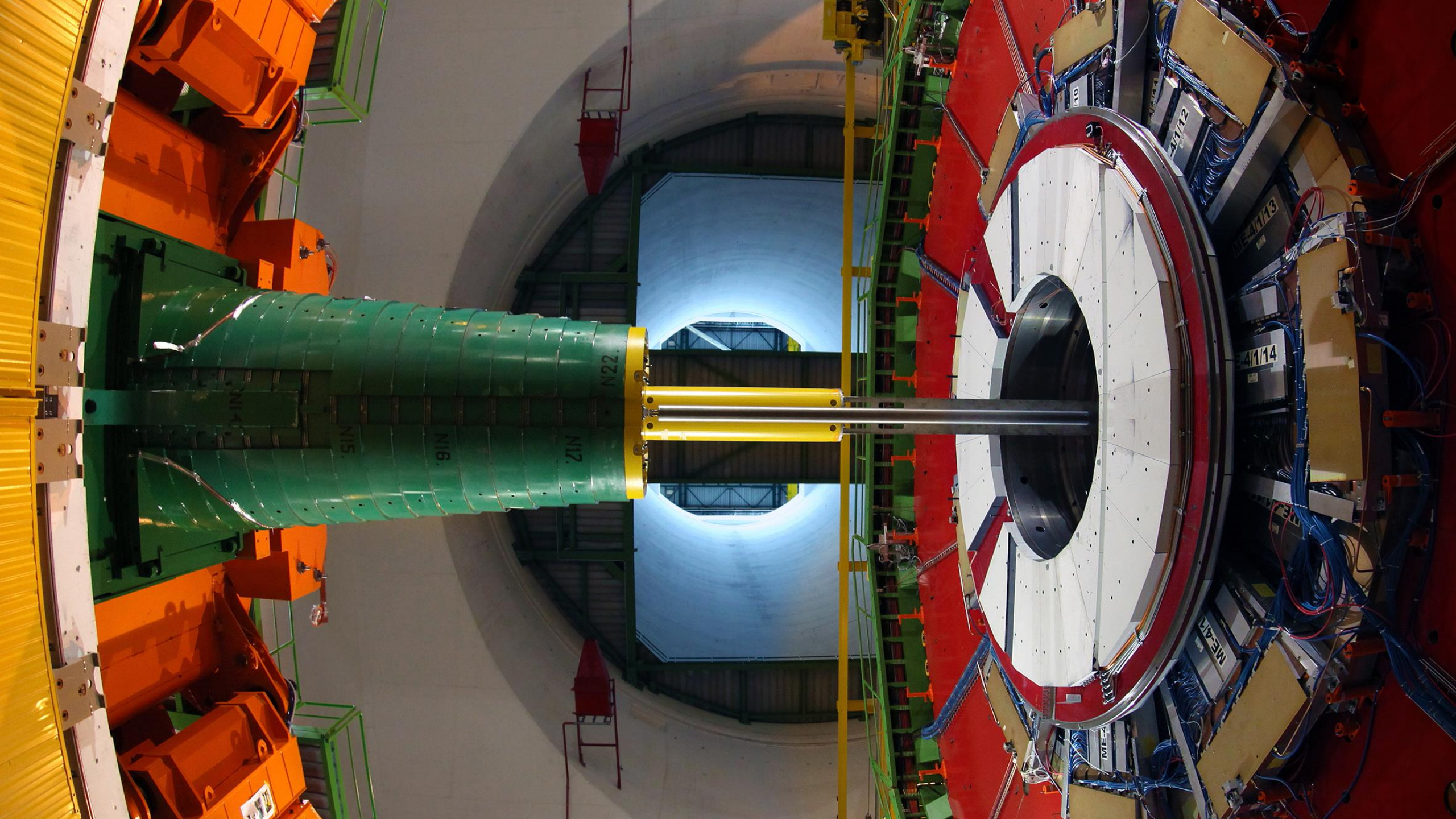




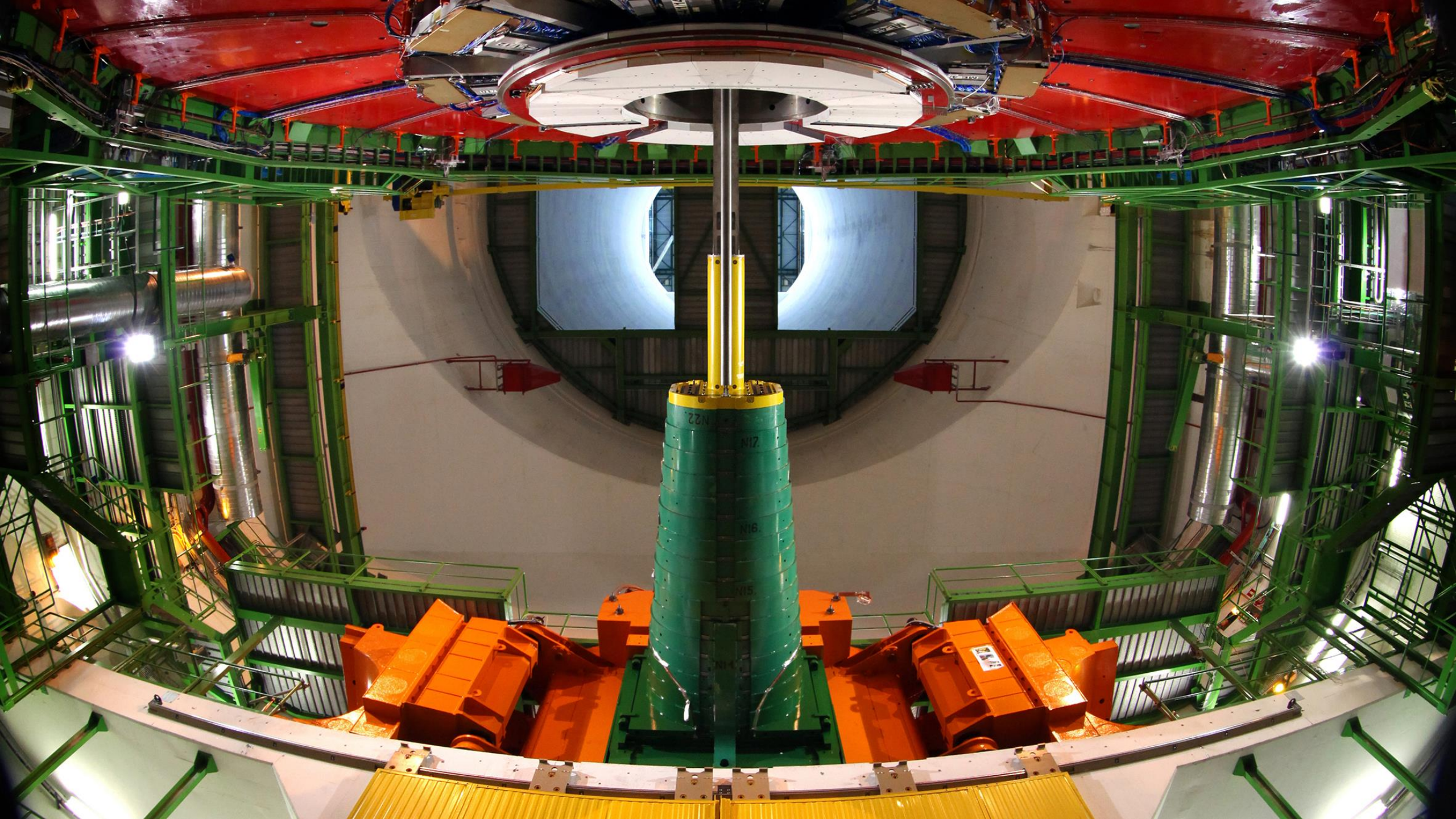


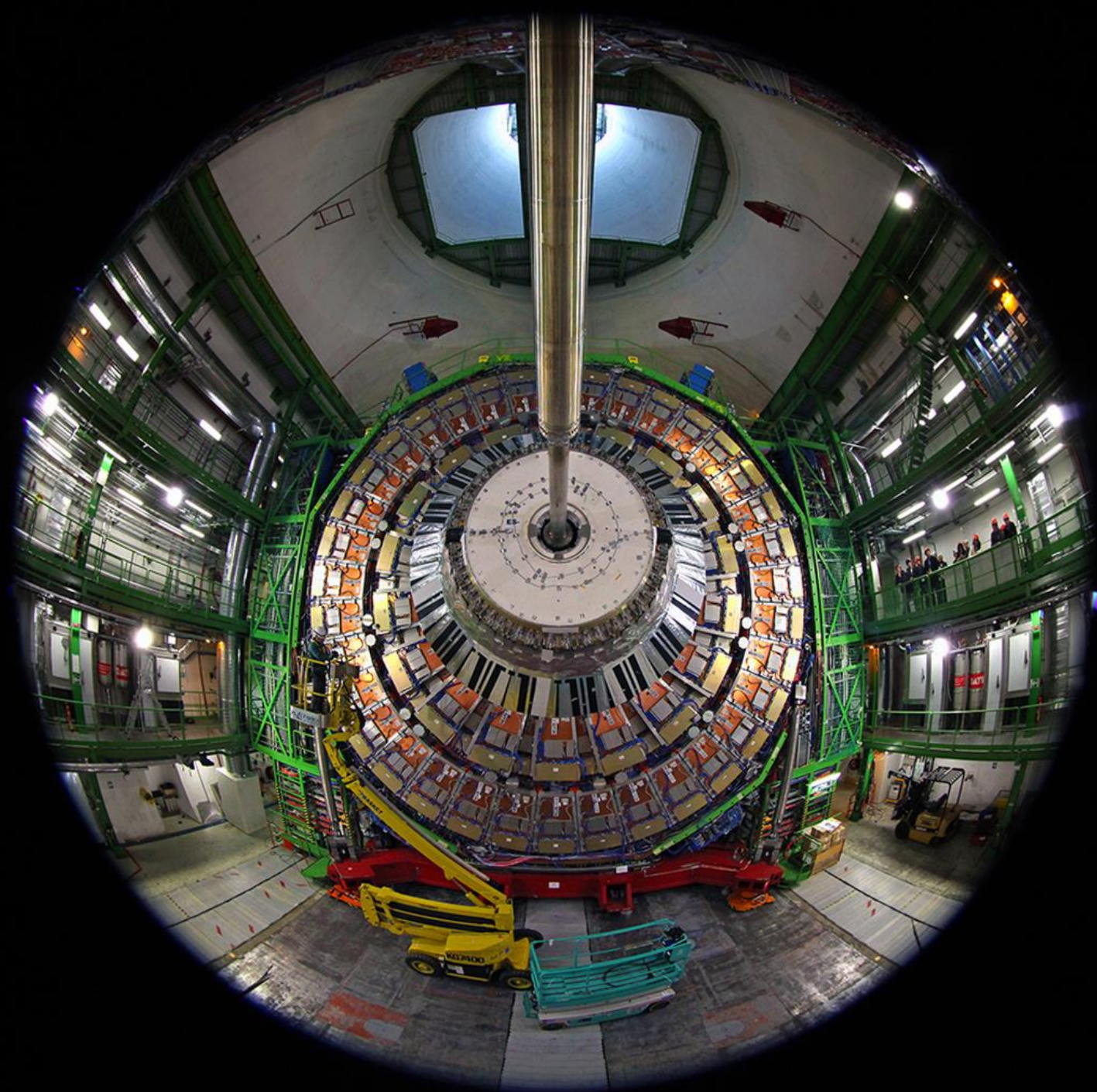


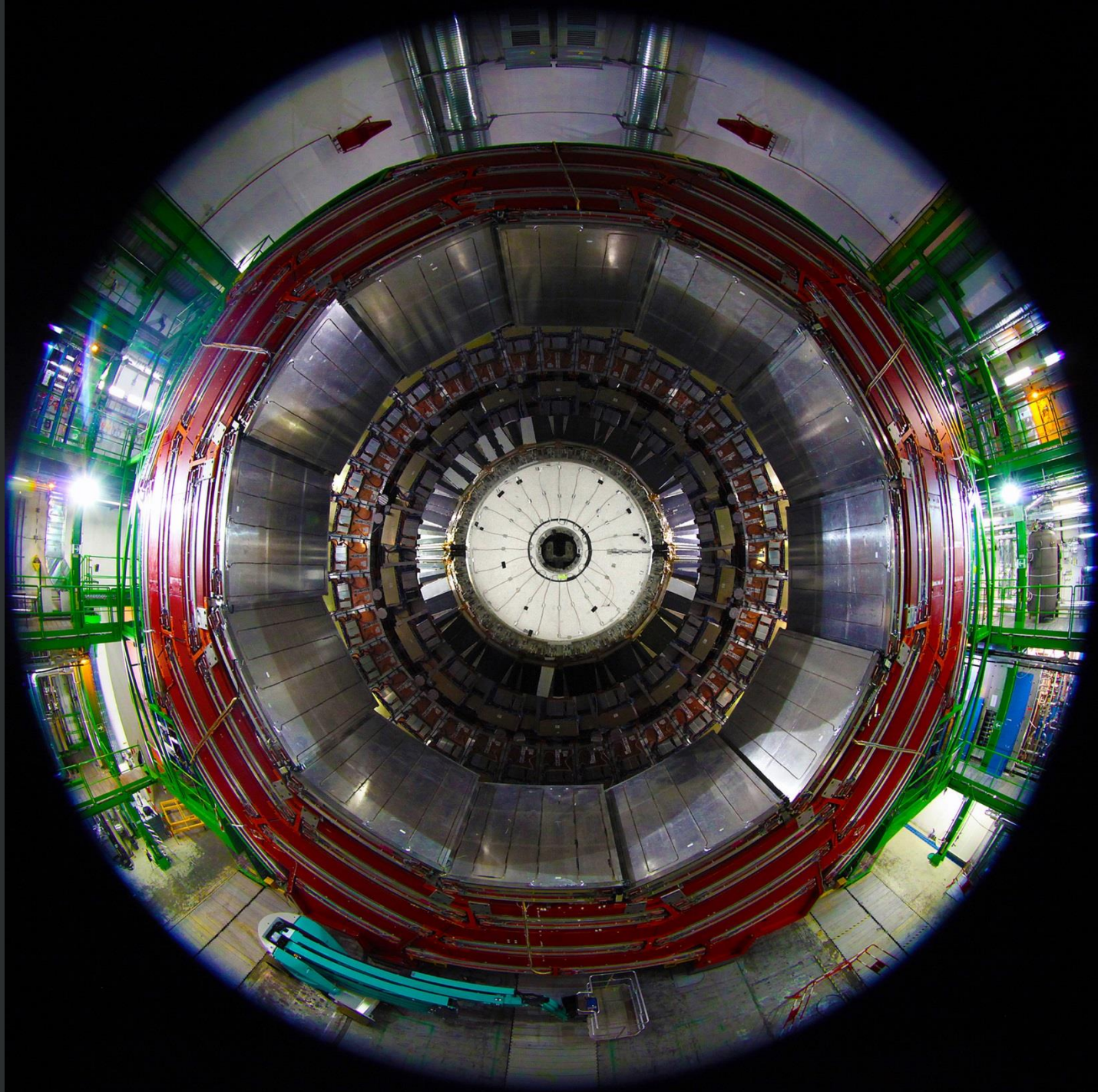


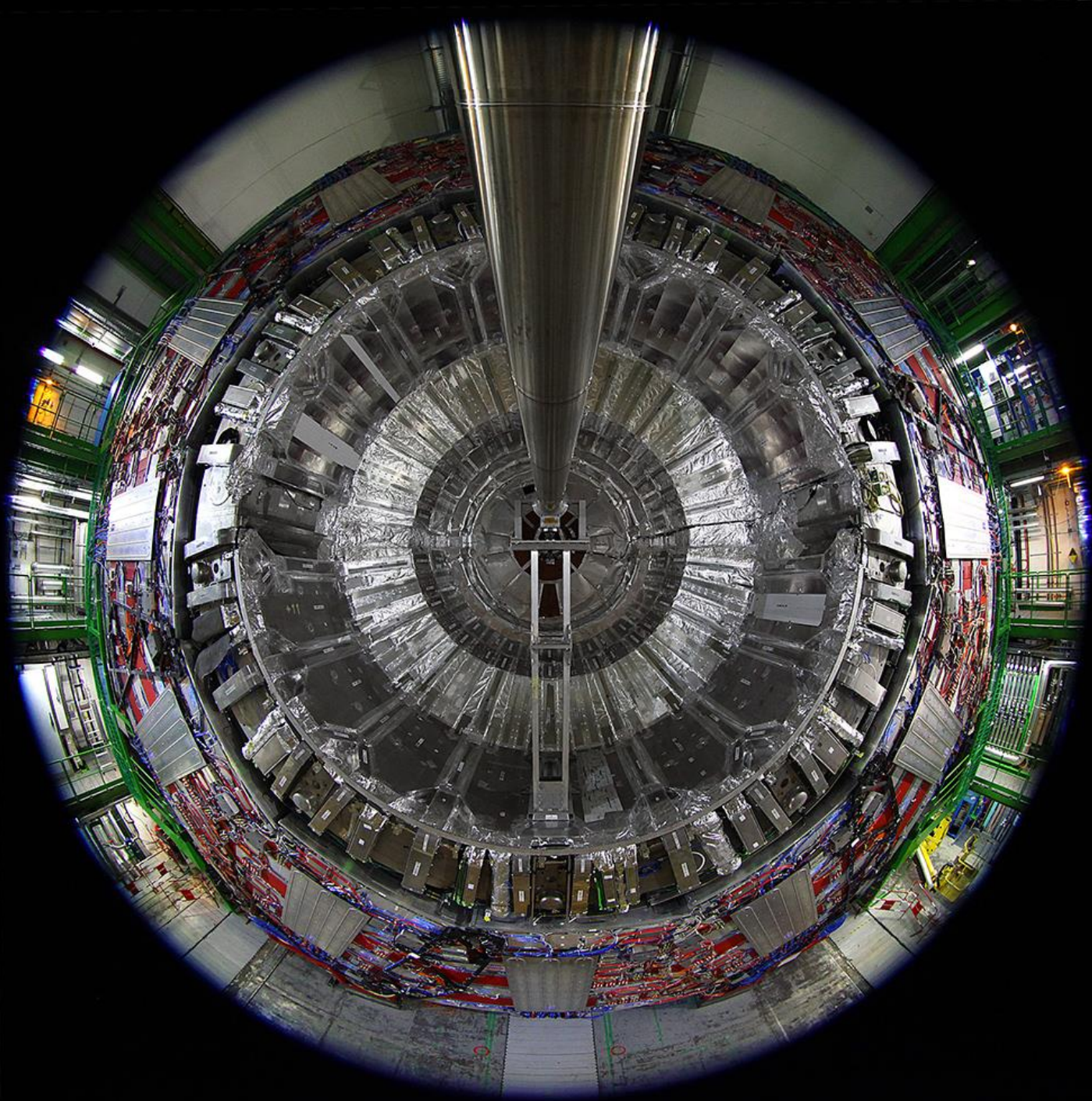








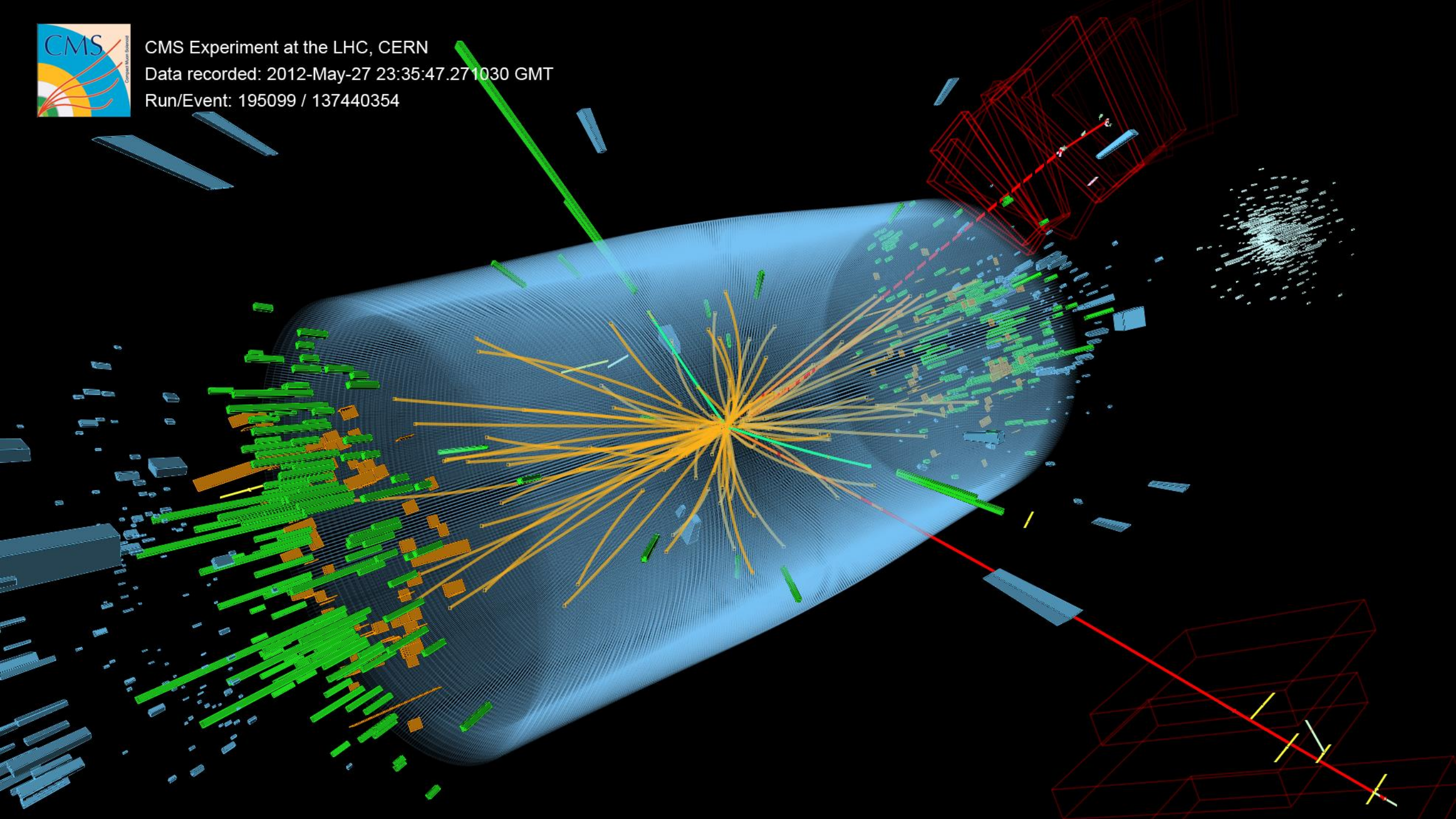


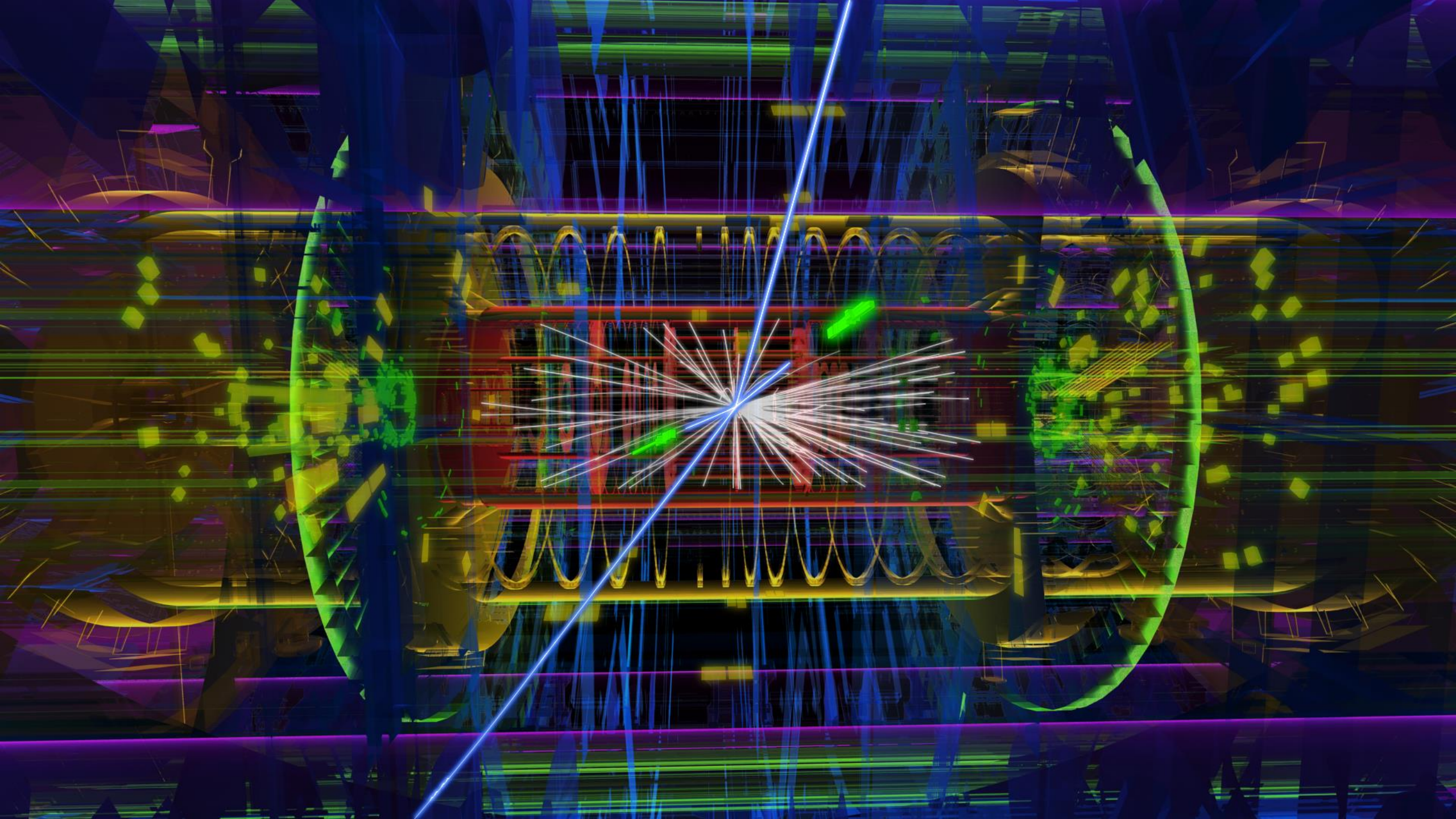






CMS Experiment at the LHC, CERN  
Data recorded: 2012-May-27 23:35:47.271030 GMT  
Run/Event: 195099 / 137440354





Science requires that we continually reassess our place in the cosmos.

“Where do we come from?      What are we?      Where are we going?”

Great art asks the same questions and when we experience it,  
it changes our perspective.

Ian Shipsey  
Oxford University UK

“The most beautiful thing we can experience is the mysterious.

It is the source of all true art and all science.”

Albert Einstein



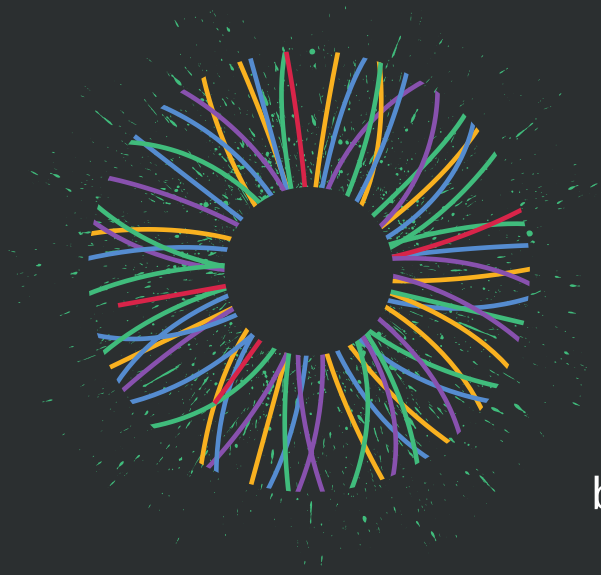
“Where do we come from?      What are we?      Where are we going?”



The Question Particle Physics tries to answer with LHC experiments at CERN is  
“What is the Universe made of ?”

art@CMS program Mission

## Engagement & Networking



**art@  
CMS**  
art of science  
beauty in creation

Help our science community to reach out to the general public and especially young people by connecting the arts with the beauty of particle physics, physics and science in general to better understand the world we all experience.

# art@CMS: What We Do

## *Exhibitions*

The outcome of collaboration between artists, art institutes, scientists and CMS institutes and act as catalysts for promoting public interest and understanding of science.

no limits of arts, photo, painting sculpture, music, dance, ....

## *science & art workshops – for graduate and undergraduate students*

Interdisciplinary in their nature, SciArt workshops enable young people to gain a better understanding of science, to be inspired and encouraged, and to develop skills that are critical to the challenges of the 21<sup>st</sup> century.

science learning (masterclass) followed by creative art production

# art@CMS: Objectiv → IMPACT

result 2012 - 2017

How many exhibitions

6 (2017) 21 (2016), 12(2015) 12(2014) 10 (2013) 2 (2012)

How many workshops 20

How many people reached

reached ~ 1 000 000 people

reached ~2000 students

# Exhibitions

Split/ Palazzo Milesi



Bonn / Deutsches Museum



FermiLab

London / CLS



Brooklyn NY

Athens / Technopolis



Higgs Discovery Celebration on Capitol Hill  
Washington D.C. USA  
November 20, 2013



Sofia / Earth & Man Museum



Brussels / Academy Palace

# Exhibitions

Torino / Museum Ettore Fico



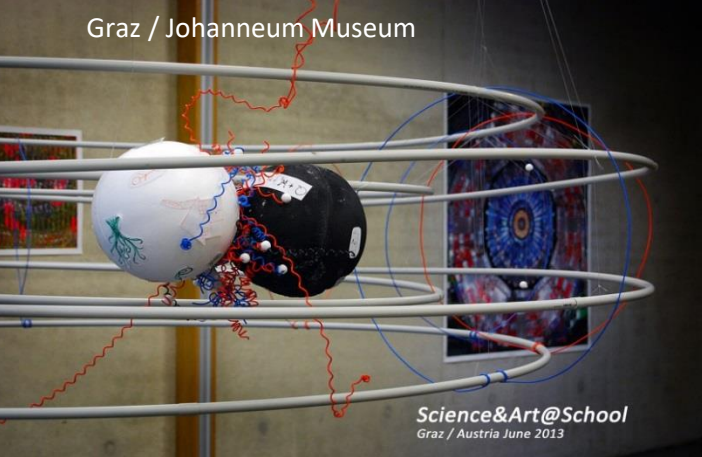
Cessy / CERN P5 CMS



Vienna / University



Graz / Johanneum Museum



Science&Art@School  
Graz / Austria June 2013

Valencia / Congress Palace



Geneva / Art Centre ECOLINT



Geneva / Ferme de la Chapelle



Brooklyn NY / SFC

Vienna / Collegium Hungaricum



Vevey / Gallery Ferrari



St Petersburg / Library





National History Museum NHM Vienna  
October 18<sup>th</sup> 2016 – August 20<sup>th</sup> 2017  
Cooperation: NHM – HEPHY  
Expected visitors 500 000 !



Landesmuseum fuer Vorgeschichte Halle Germany  
October 23<sup>th</sup> 2016 – June 20<sup>th</sup> 2017  
Expected visitors 50 000 !



# Workshops



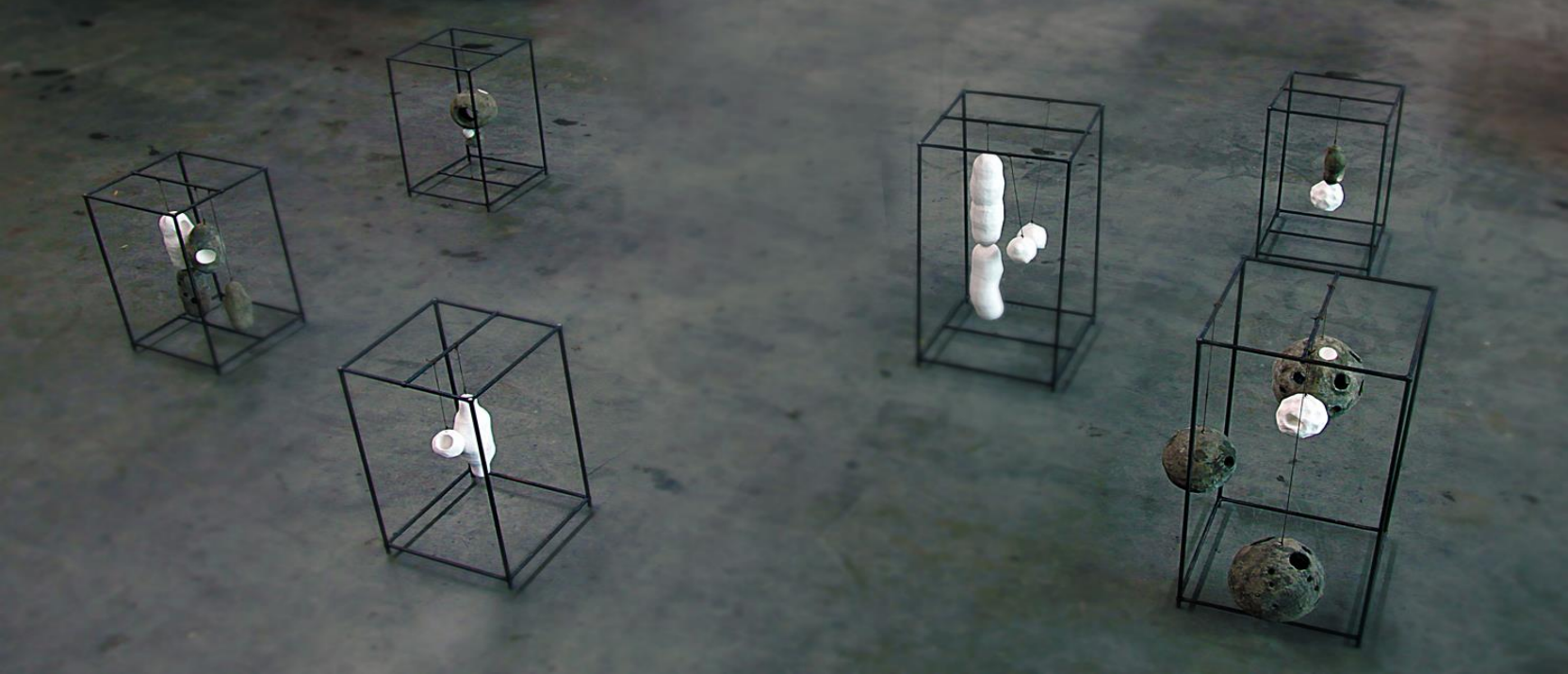
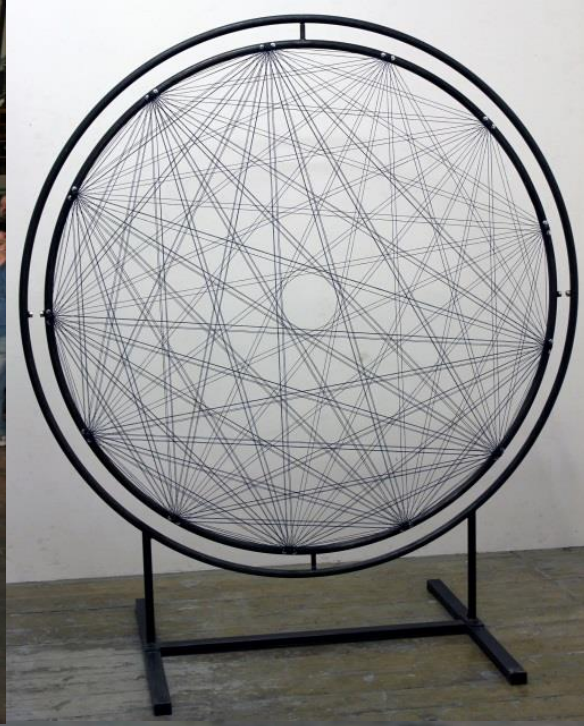
Science&Art@School ECOLINT : <https://www.youtube.com/watch?v=yTqDm0Yp04E>

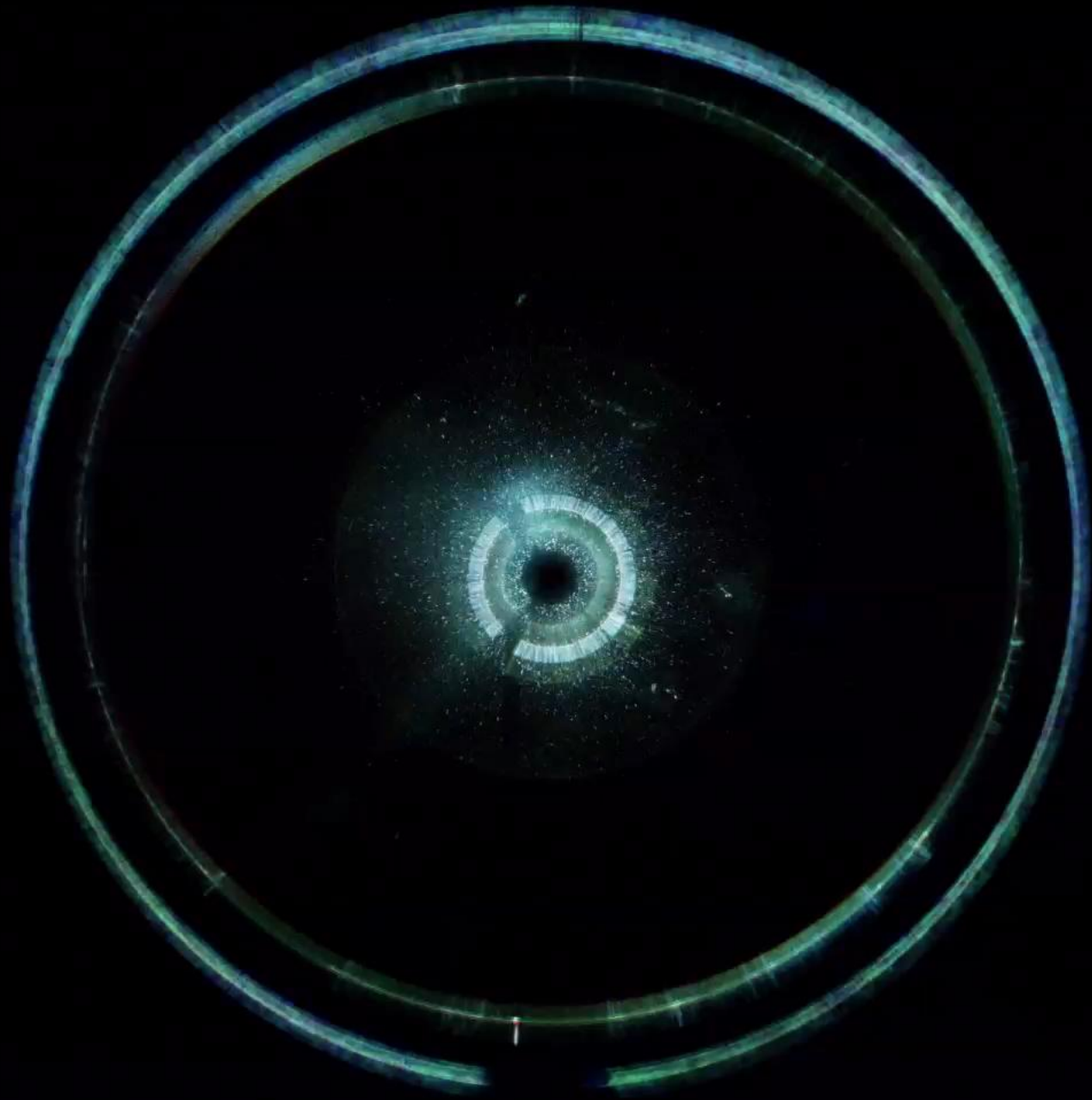
















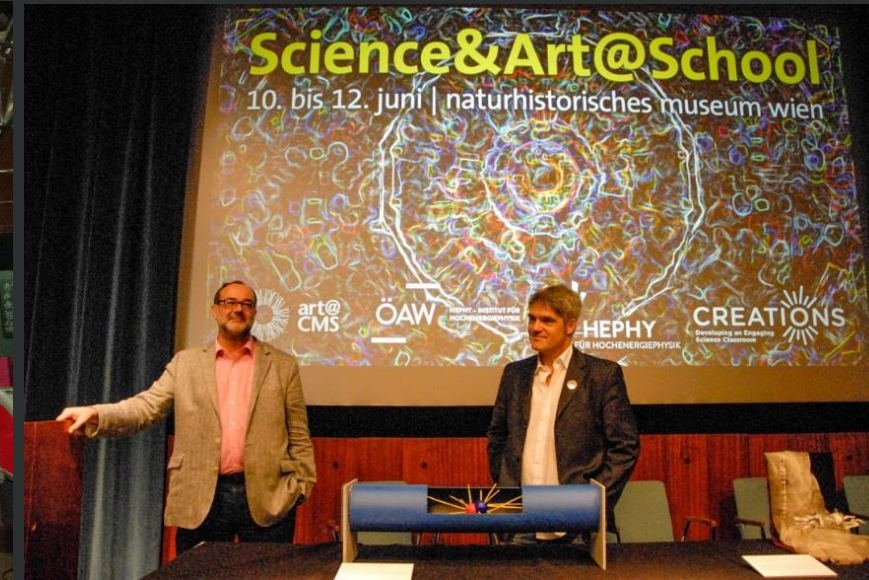
# Science&Art@School – Cultural Collisions

You are cordially invited to  
**Cultural Collisions**

An art exhibition, music and dance performance presented  
by Austrian and Genevese students



Photos : CERN Bldg 40 became a stage for students



CERN Meyrin Bldg 40

February 24<sup>th</sup> 2017

In the presence of His Excellency Thomas Hajnóczi,  
Permanent Representative of Austria to the international organizations in  
Geneva / Switzerland

18h30 Opening  
19h00 Welcome  
19h15 art show & performance by Haydn Gym. Vienna,  
Herz Jesu Gym. Salzburg, ECOLINT LGB Geneva,  
20h00 Drinks  
21h00 Close



art@CMS INFN Italian Tour has similar activities and creates synergies between various action to inspire students



# Science&Art@School – Cultural Collisions

science&art@school event 2017 in Vienna (June) and the Cultural Collisions event at CERN (February) :

This is a Horizon 2020 EU project CREATIONS <http://portal.opendiscoveryspace.eu/creations>

*Photos of the event in the Natural History Museum Vienna June 2017:* <https://goo.gl/photos/esmfuMAx8Xr5K3V66>

Videos of the science&art@school event in the NHM :

Rhythm of Science : <https://youtu.be/DjKH7f1PNpI>

Cultural Collisions – dance : [https://youtu.be/Bly\\_iERk5Ps](https://youtu.be/Bly_iERk5Ps)

Science Rap “Particle Love”: <https://youtu.be/sdB2PydXUW8>

## ***Cultural Collisions @ CERN February 2017***

Photos: <https://goo.gl/photos/2tpnAg7TnsWEjq9q6> [https://1drv.ms/f/s!Al-rN-l0kS2sg\\_gLpGmn7xOEnwjlFQ](https://1drv.ms/f/s!Al-rN-l0kS2sg_gLpGmn7xOEnwjlFQ)


Video of a student of the workshop @ CERN: <https://www.youtube.com/watch?v=TEsgtwUv6xk>

CCC Cultural Collisions CERN – a dance performance by students @ CERN: <https://youtu.be/ETjKwUS0yfg>







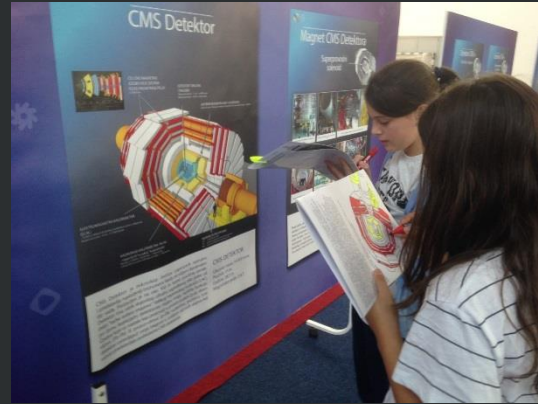
# sciARTmasterclass – Science Festival

Otvoreni dani nauke  
**Mladi naučnik**  
5-9 godina



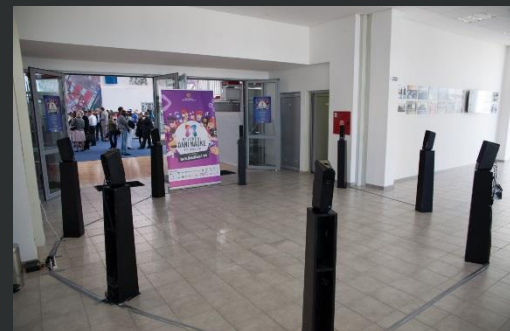
Ime: \_\_\_\_\_ Godine: \_\_\_\_\_



Students participating in the CMS Junior Scientist Program art@CMS interdisciplinary Exhibition with: real detector & accelerator equipment, art works, creative corners, lectures and detector workshops as well as sciART workshops.

Montenegro 2017: <https://www.youtube.com/watch?v=9vflW-Pf7vg>  
Athens 2015: <https://www.youtube.com/watch?v=t8MHsCaYks>



# University of the Arts London - Saint Martins College of Art

local scientific partner: Imperial College

2 semester sciART course October 2016 – June 2017

- 22 students supervised by Prof. Nathan Cohen, Dr. Andrew Charalambous
- Weekly lectures at the UAL/CSM
  - Lectures from colleagues of Imperial College
  - Visit at CERN 5 days December 5 days May
  - Offered workshops at CERN during May visit
  - Final show in London June and November

Photos: <https://goo.gl/photos/VfSSqkg7cN7Ejzs97>

**ARTISTS PRESENTATION EVENING**

Central Saint Martins MA Art & Science students (London) present a

**PechaKucha Night**

Tuesday 9 May  
drop in from 5pm

Restaurant 1, next to the glas box




**PHOTOGRAPHY WORKSHOPS**  
with Central Saint Martins MA Art & Science (London) students at CERN this Wednesday – FREE

**Wed 10 May 10.30–12.30pm UP TO 12 PEOPLE**  
**Pinhole Camera Workshop**  
with Olga Suchanova

In this workshop, you will learn how to make a pinhole camera in a 30-minute demonstration using a special edition beer can designed and sold by Tate Modern and the basis of Olga's camera. We will take photographs with this device and develop them in a DIY darkroom. Also, you can become part of the project 'Chasing the Sun' and learn how to take Solargraphs. All materials provided.

To register, email Olga at [olga.suchanova@hotmail.com](mailto:olga.suchanova@hotmail.com)  
Meeting point Bldg 40 coffee area CMS side 10:25



**Wed 10 May 2.30–3.30pm UP TO 12 PEOPLE**  
**Solar Prints–Cyanotype Workshop**  
with Lisa Pettibone

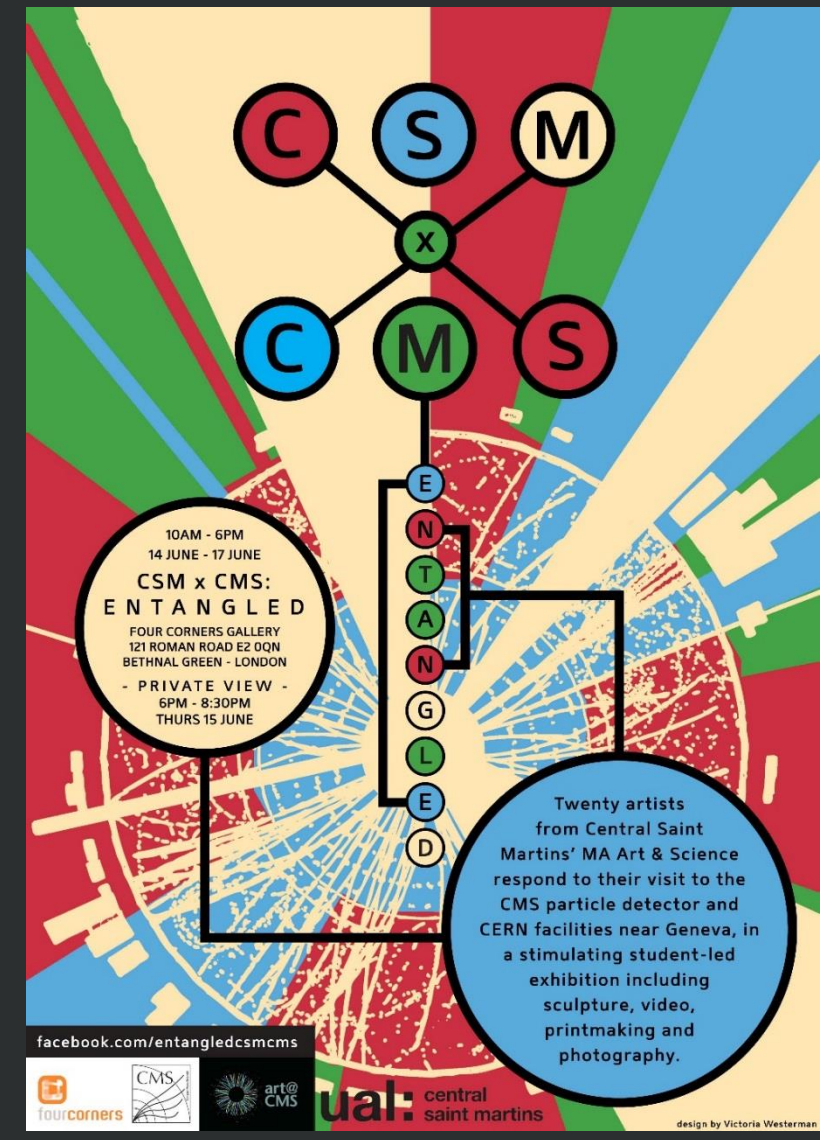
This workshop will use the sun's ultra-violet rays to interact with ferric-based chemicals on paper, creating beautiful images called cyanotypes, an early photographic process used by Sir John Herschel in 1842. We will make contact prints using objects arranged on pre-coated paper and placed in the sun. Mysterious shapes emerge from an intense blue background. **Please bring several objects to use, other materials are provided.**

To register email Lisa at [lpettibone@btinternet.com](mailto:lpettibone@btinternet.com)  
Meeting point Bldg 40 coffee area CMS side 14:25



Hosted by  
CMS art@CMS

for any further questions please contact Michael.Hoch@cern.ch  
CERN phone: 16 5720



**10AM - 6PM**  
14 JUNE - 17 JUNE  
**CSM x CMS:**  
**ENTANGLED**  
FOUR CORNERS GALLERY  
121 ROMAN ROAD E2 0QN  
BETHNAL GREEN - LONDON

**- PRIVATE VIEW -**  
6PM - 8:30PM  
THURS 15 JUNE

Twenty artists from Central Saint Martins' MA Art & Science respond to their visit to the CMS particle detector and CERN facilities near Geneva, in a stimulating student-led exhibition including sculpture, video, printmaking and photography.

facebook.com/entangledcsmcms

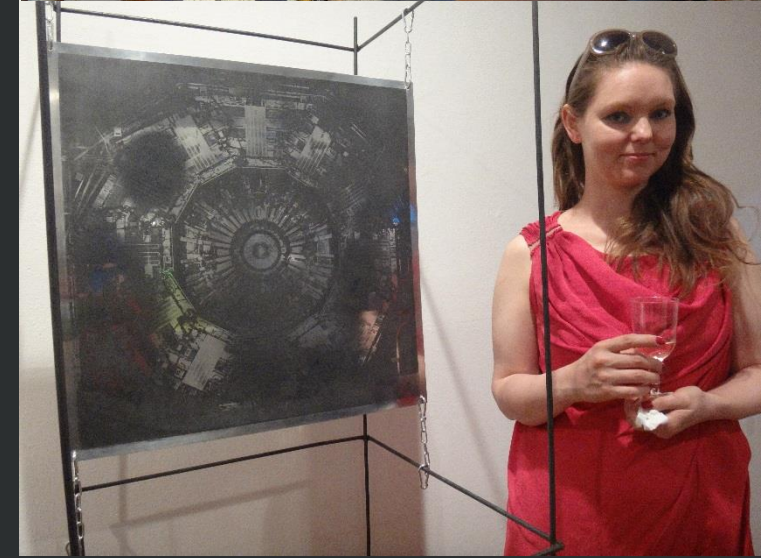
fourcorners CMS art@CMS ual: central saint martins

design by Victoria Westerman

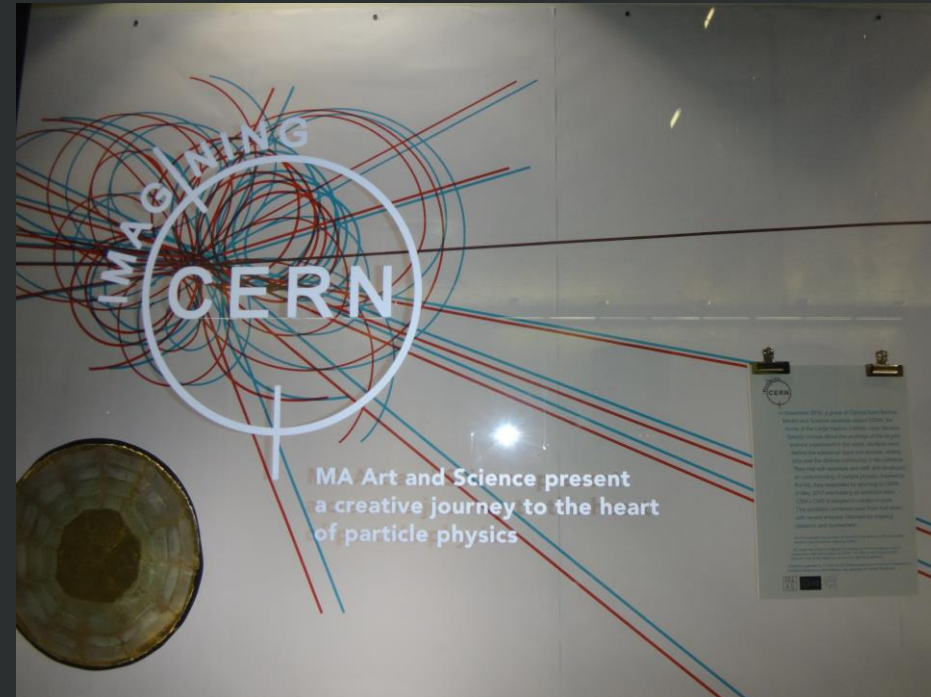
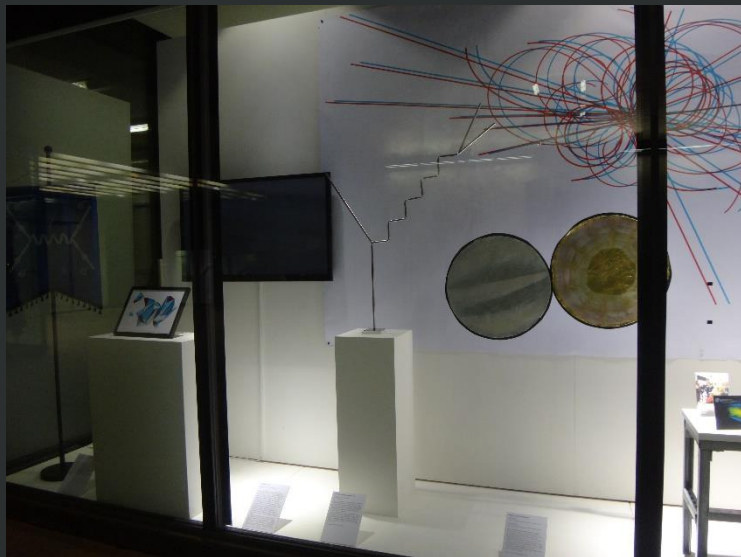
# University of the Arts London - Saint Martins College of Art

local scientific partner: Imperial College

Vernissage / Exhibitions: June (Labyrinth) November (CSM) 2017



# University of the Arts London -Saint Martins College of Art local scientific partner: Imperial College Windows Gallery Exhibition CSM –Nov 2017 Jan 2018 – Symposium No



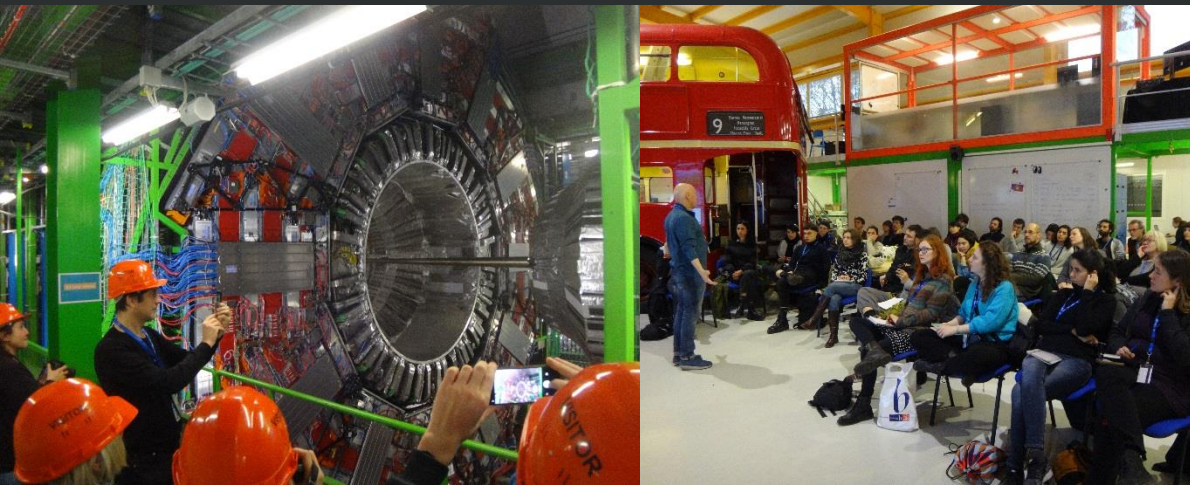
# Applied Arts University Vienna

local scientific partner: HEPHY

2 semester sciART course October 2016 – June 2017

- 2 x 11 students / 11 staff
- Weekly lectures at the Applied Arts University
  - Visit & Lectures from colleagues of HEPHY & TU
  - Visit at CERN 5 days December
  - Artwork rehearsal March
  - Particle detector construction workshop March
  - Final show in Vienna June

Photos : <https://goo.gl/photos/i6MqYfwCRgnNVs4N9>



**Opening**  
June 6th 2017, 19:00

**Accompanying Program**  
June 9th 2017

**das weisse haus**  
Hegelgasse 14  
1010 Vienna

**EXHIBITION**  
JUNE 7th-17th 2017

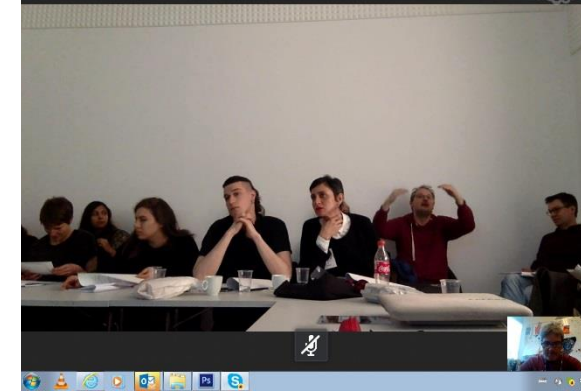
**CIRCUIT TRAINING**

**A FORAY INTO THE WORLD OF THE LARGE HADRON COLLIDER**

A project from students of the University of Applied Arts Vienna (ArtsScience and Site-Specific Art) in cooperation with CERN (Art@CMS and HEPHY)

Participants: Natalia Gureva, Carmelia Tarilante Rodriguez, Denise Schellmann, Athanasios Grammosis, Lukas Gritznner, Benedikt Melzl, Rosie Beam, Rafael Lippuner, Galnaz Bashiri, Julia Mag, Nora Drumeva, Andreas Budak, Danicela Brill, Johanna Falkmann, Marko Markovic, Lela Nomada, Marina Rebhandl, Canus Ergin, Francesca Aldigiani, Frederique Neuts Leroy

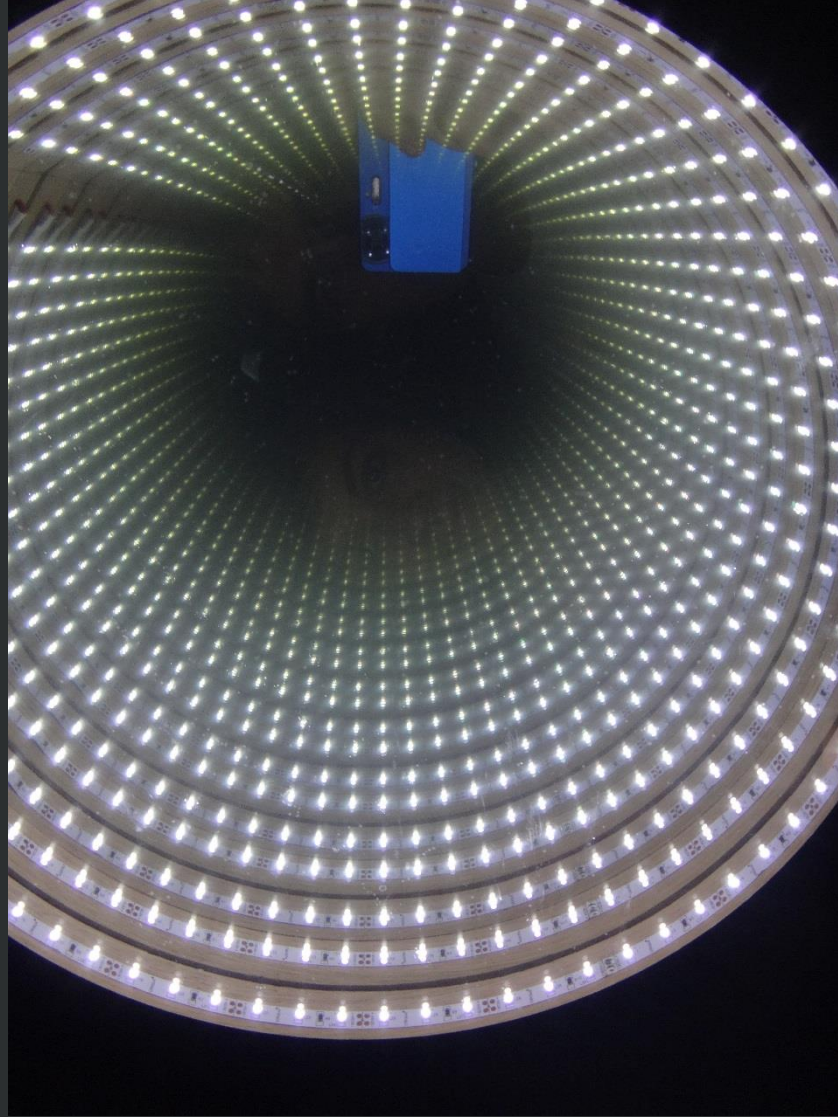
Logos: W, dt:angewandte, HEPHY, art@CMS, CMS



# Applied Arts University Vienna

local scientific partner: HEPHY

Vernissage / Exhibition June 2017



# Chelsea College of Arts London

## 1 semester sciART course October 2014-2015-2016

- supervision Prof. Dave Webster
- Weekly lectures and discussions at UAL
  - 2014/ 2015 Visit at CERN with 4 students + 4 trainees Shoreditch Trust
  - 2015/2016 - Visit at CERN 5 days, Final show TriangleSpace London June



### OUR CONCERN

A collaborative project between the CMS collaboration at CERN, Camberwell, Chelsea and Wimbledon Colleges of Arts (part of UAL), the Shoreditch Trust and Allminds which involved recent Fine Art graduates from Wimbledon College of Arts and young people from the Shoreditch Trust Active Citizens programme visiting the CERN laboratory.

**Friday 28th Nov 2014**  
 Private View: 9 - 8pm  
 Restaurant Exhibition:  
 • Performances  
 • Food and drinks (canapes)

**\*Saturday 29th Nov to 9th Jan 2015**  
 Restaurant Exhibition

Waterhouse, 10 Orsman Rd  
 London N1 5QJ

\*Please note Waterhouse will be closed for the holidays from Dec 25th - Jan 6th

ual: university of the arts london | 
 CERN | 
 CMS | 
 Shoreditch Trust | 
 ALLMINDS | 
 L&

## Feynman inspired art

a construction manual

Andy Charalambous in collaboration with CERN HST Programme 2017



Fig.1: Coreen, 2012

### 1. Introduction

When I left school I went to work as a technician for the Physics and Astronomy department at a university in London. I trained as an engineer and spent many years designing and building equipment for the research groups there. My interest in science grew as I worked with these groups and got a better understanding of the science they were researching. I loved my job because it gave me so much insight into the science involved.

When I left that job and started as an artist I found that the excitement of science was something I didn't want to move away from. So, I decided to use science as the inspiration for my art. Most of the art I make comes from some bit of science that has seeded an idea. Science is a tool for letting us see our world more clearly, and for me it also inspires my work. By the way, I have not moved very far from the university I worked at. I am Artist in Residence for the Astronomy group and the High Energy Physics groups there, as well as being part of the art@CMS project run by Michael Hoch at CERN.

# sciARTbooklet

## a manual for an art and a science teacher to re- create and create topical artworks

### art@CMS 2017

UK collaborative artists :  
Rachael Nee , Andy Charalambous

in preparation:  
"data sonification" by Federico IT,  
"particle detection" by Ch. Henschke AU

## Orders of Magnitude – Potato Powered Cosmos

a construction manual

Rachael Nee in collaboration with HST Programme 2017



### 1. Introduction

This booklet is written for science and art teachers with the aim of interdisciplinary learning. It assumes no knowledge of the other disciplines subject. In it you will read about the art installation from both the science and art viewpoints and how to reconstruct it. This becomes a jumping off point for the development of new artworks by High School students, with questions along the way.

Science and contemporary art have different end goals; however, they also have a lot in common. Both contemporary art and science have similar methodologies involving; investigation, research, testing out of ideas and theories through experiment. They share imagination, curiosity, quest for knowledge and are forms of inquiry. When successful both allow the world to be seen in new ways.



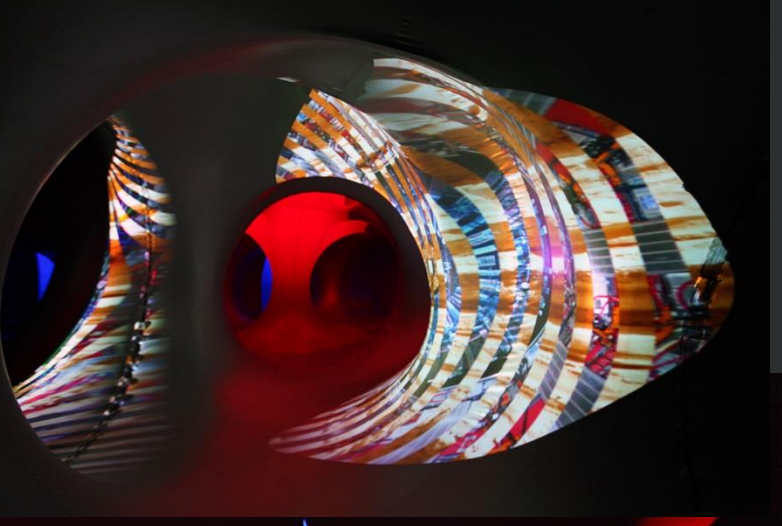
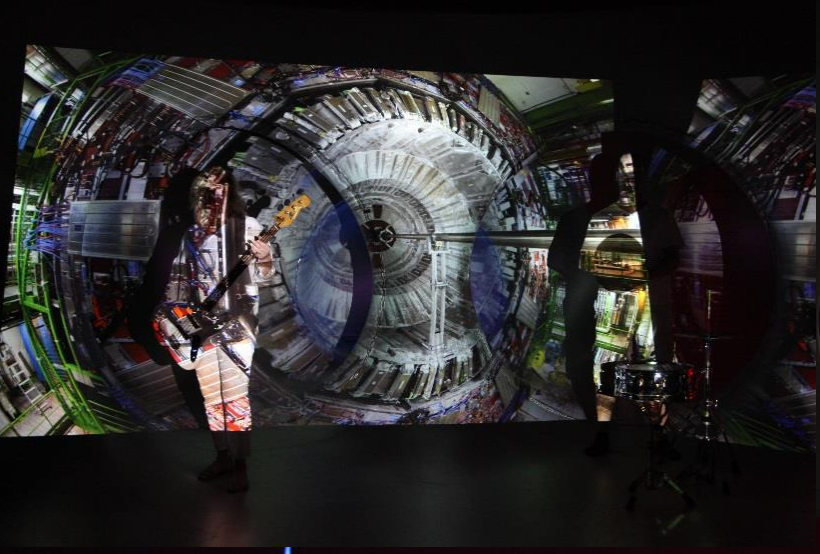
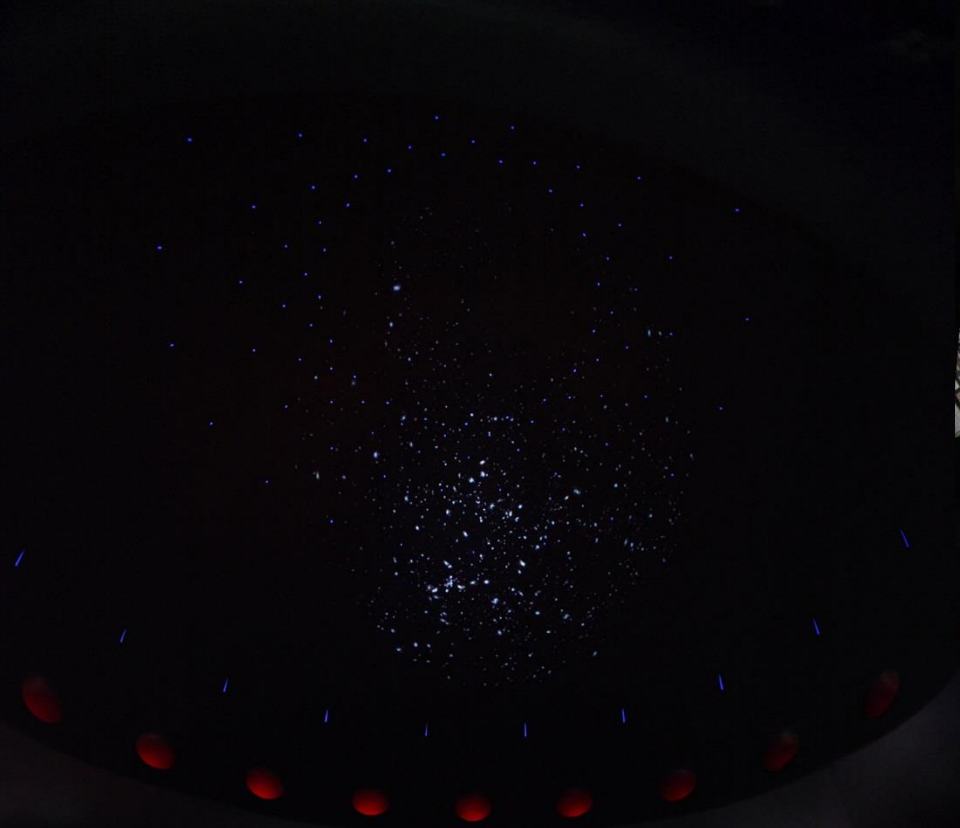


**art@CMS  
&  
Architects of Air**

is a synthesis of 2  
unique partners whose  
core activity address the  
wonder of light and the  
wonder of the universe.

Combining the  
imageries of the  
machinery of CERN  
with the curvilinear  
environment of the  
Architects of Air dome  
creates an incredibly  
intriguing layer of  
visual experience.





# art@CMS: collaborative artist CONSENSUS

CONSENSUS participates as well in science & artworkshops



## *UK Rapper launches album **CONCERNED***

*after 2 years of collaboration his science rap album ConCERNed. His scientific partner is Sudan Paramesvaran / CMS Bristol UK*

**CERN Article** (all info):

<http://cms.cern/news/concerned-using-hip-hop-engage-new-audiences-particle-physics>

## *More Infor & Links:*

- The BBC interview of ConSensus and Sudan [the sequence starts at 1:11.18 until 1h26.26]
- <http://www.bbc.co.uk/programmes/p04zv0g0#play>
- <https://www.youtube.com/watch?v=MJXaBq5VTNc>
- Press article in the journal “The Voice” here's the online version:
- <http://www.voice-online.co.uk/article/south-london-geneva-hip-hop-science-lessons>
- Two music videos of the 9 tracks from the album is available on youtube
- <https://www.youtube.com/watch?v=tJl8-ArzkBg&feature=youtu.be>
- <https://www.youtube.com/watch?v=1ju3fo37yLE&feature=youtu.be>
- Science Rap StudentsWorkshop “Particle Love”: <https://youtu.be/sdB2PydXUW8>

# Future enhancements and collaborations

## Scientific Communities :

LIGO, VIRGO

Muongrapher

ATLAS Canada

South Asia India

## Art Communities:

KASK Ghent/BE -> EPS2019 Ghent

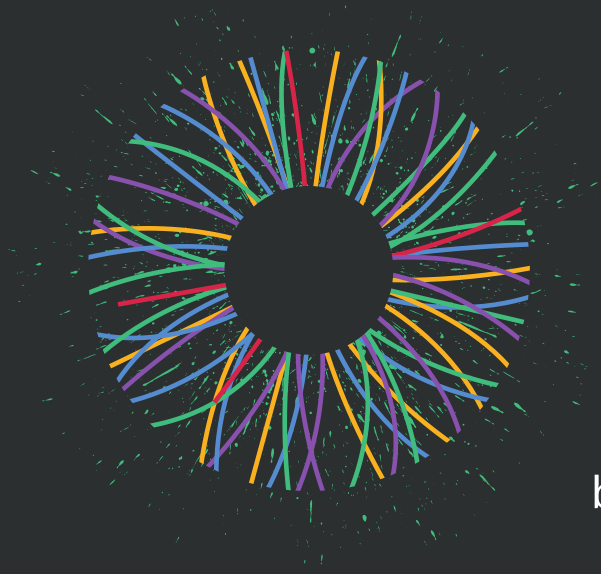
BRERA , Milan /IT

Ministry Education Ontario /CA

Queensland Academy /AU

LifeLAB India

THANK YOU  
for you attention



art@  
CMS  
art of science  
beauty in creation

**Opening**  
June 6th 2017, 19:00

**Accompanying Program**  
June 9th 2017

**EXHIBITION**  
**JUNE 7th-17th 2017**

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**Artists:** Johanna Falkmann, Marko Markovic, Lola Nomada, Marina Rebhandl, Cansu Ergün, Andrea Vezga, Nora Drumeva, Francesca Aldegoni, Daniela Brill, Frederique Neuts Leroy, Rafael Lippuner, Galnaz Bashiri, Julia Mag, Andreas Budak, Tarilante Rodriguez.

**Location:** das weisse haus, Hegelgasse 14, 1010 Vienna

**ual: university of the arts london**

**SHIFTING TERRITORIES**

**PRIVATE VIEW**  
21ST APRIL, 6PM - 9PM

**14TH - 21ST APRIL**  
10AM - 6PM WEEKDAYS ONLY

**TRIANGLE SPACE**  
CHELSEA COLLEGE OF ARTS  
16 JOHN ISLIP STREET, SW1 4JU

**Arte & Scienza**

"30 opere di artisti internazionali illustrano la scoperta del bosone di Higgs al CERN"

Xavier Cortada, Michael Hoch, Alison Gill, Paco Falco, Chris Henschke, Lindsay Olson, Francesco Paolantoni, Andrew Charalambous, Paul Schuster, Anastasia Song, Pierluigi Paolucci (INFN Napoli), Michael Hoch (CERN) per art@CMS

► **Disegnare con i ragazzi**  
16 Settembre ore 10.00  
Castel dell'Ovo

► **Incontro con la musica elettronica**  
17 Settembre ore 16.00  
Castel dell'Ovo

**Ingresso gratuito**

Progetto dell'allestimento: Arch. Maurizio Di Palo  
Progetto grafico: Orietta Serafini



# WelCome to our art@CMS NetWork

Web Page: <https://artcms.web.cern.ch/> summary dossier : <http://mhoch.web.cern.ch/mhoch/Art@CMS/Art@CMSprojects.pdf>  
Contact email: [Michael.Hoch@Cern.ch](mailto:Michael.Hoch@Cern.ch) art@CMS steering comity : [art-at-CMS@cern.ch](mailto:art-at-CMS@cern.ch) chair : Chiara Mariotti