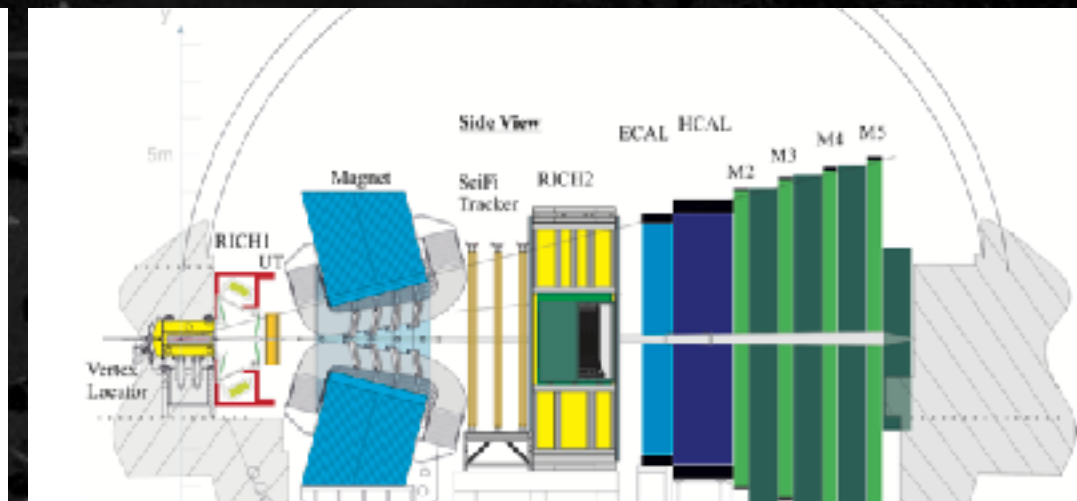
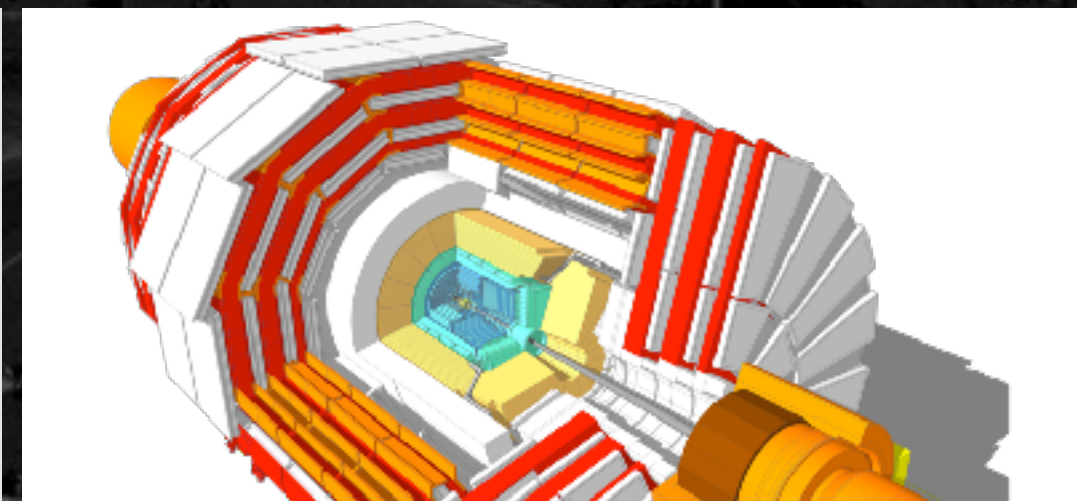
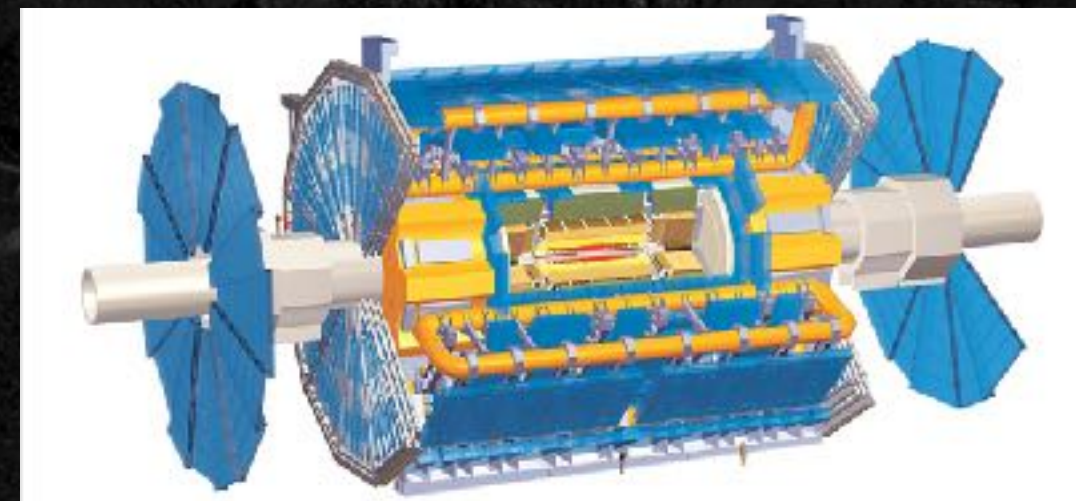
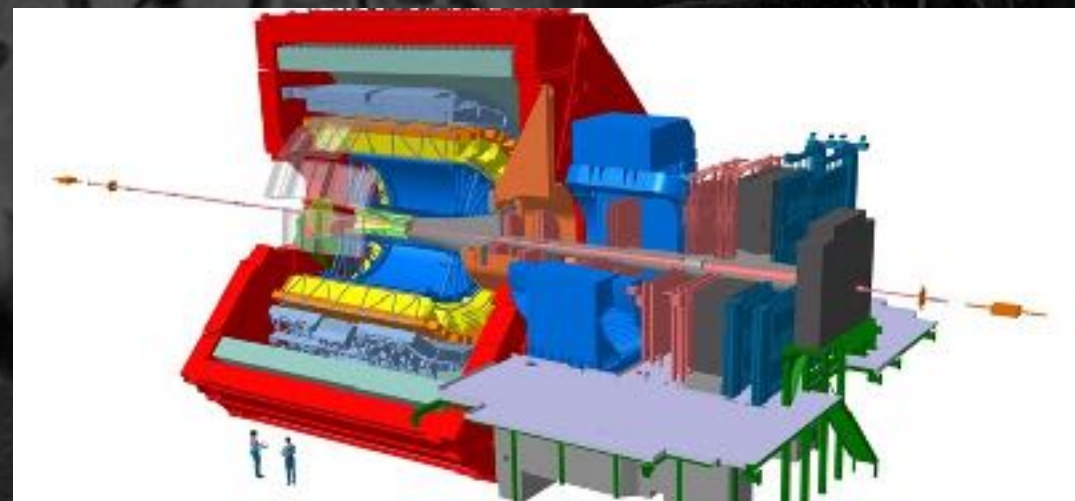


OUTREACH

# AT THE LHC



C. Trippi on behalf of ALICE, ATLAS, CMS and LHCb

LHCP Boston (US), June 2024



# COMING BACK TO THE NORM AFTER THE PANDEMIC

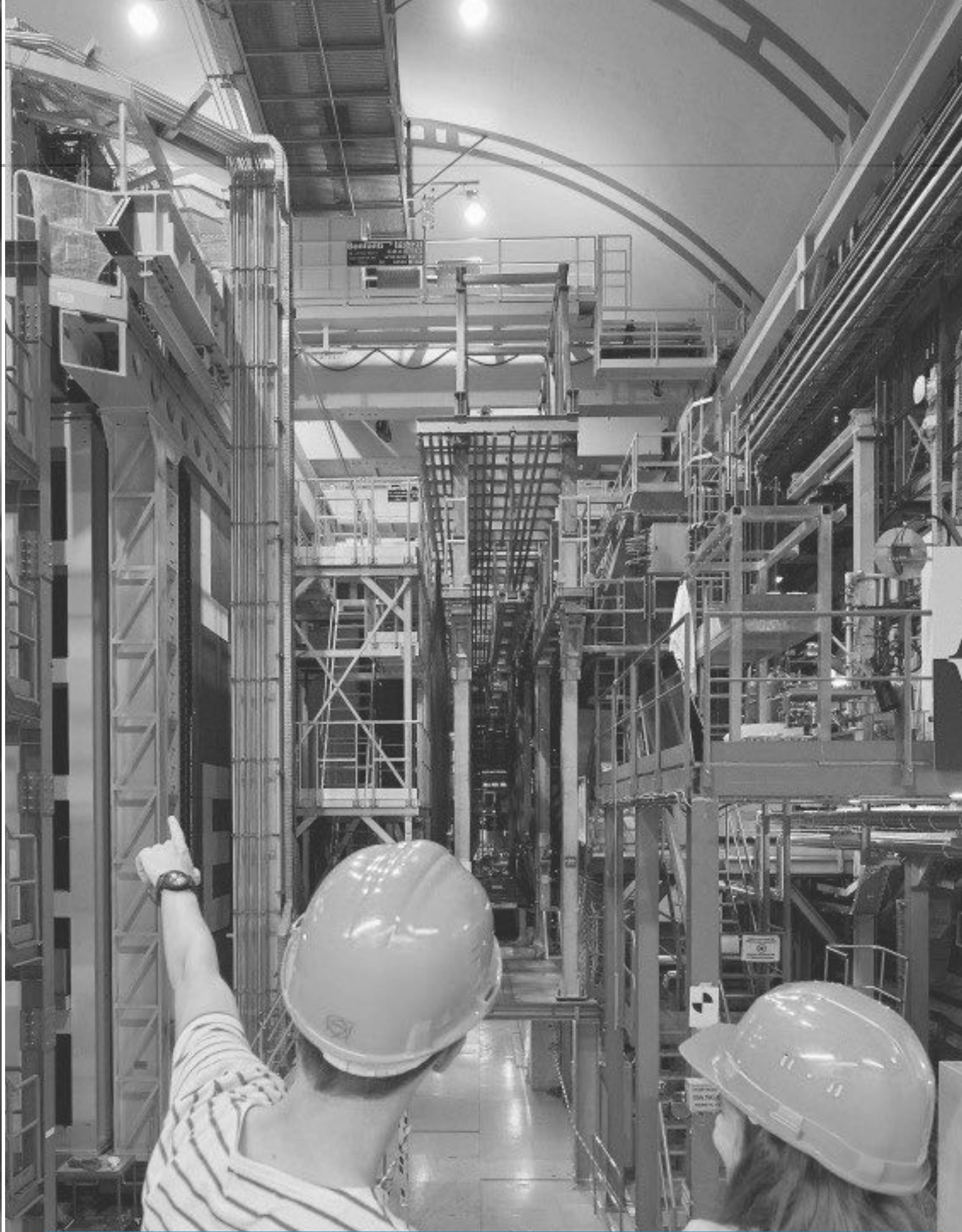
- ▶ Pandemic had a significant impact on outreach activities, but outreach strategies of the experiments were adapted
  - ▶ Making experiment visits fully online and organising online events (e.g. Q&As with scientist, online masterclasses etc)
- ▶ Online activities and events have become **new features** for experiments
  - ▶ This is especially important to reach people from remote areas and different social backgrounds

See [V. Bellées talk at LHCP 2021](#)  
for outreach activities before 2021





**VISITS  
AND  
EVENTS**



**COMMUNICATION  
CHANNELS**

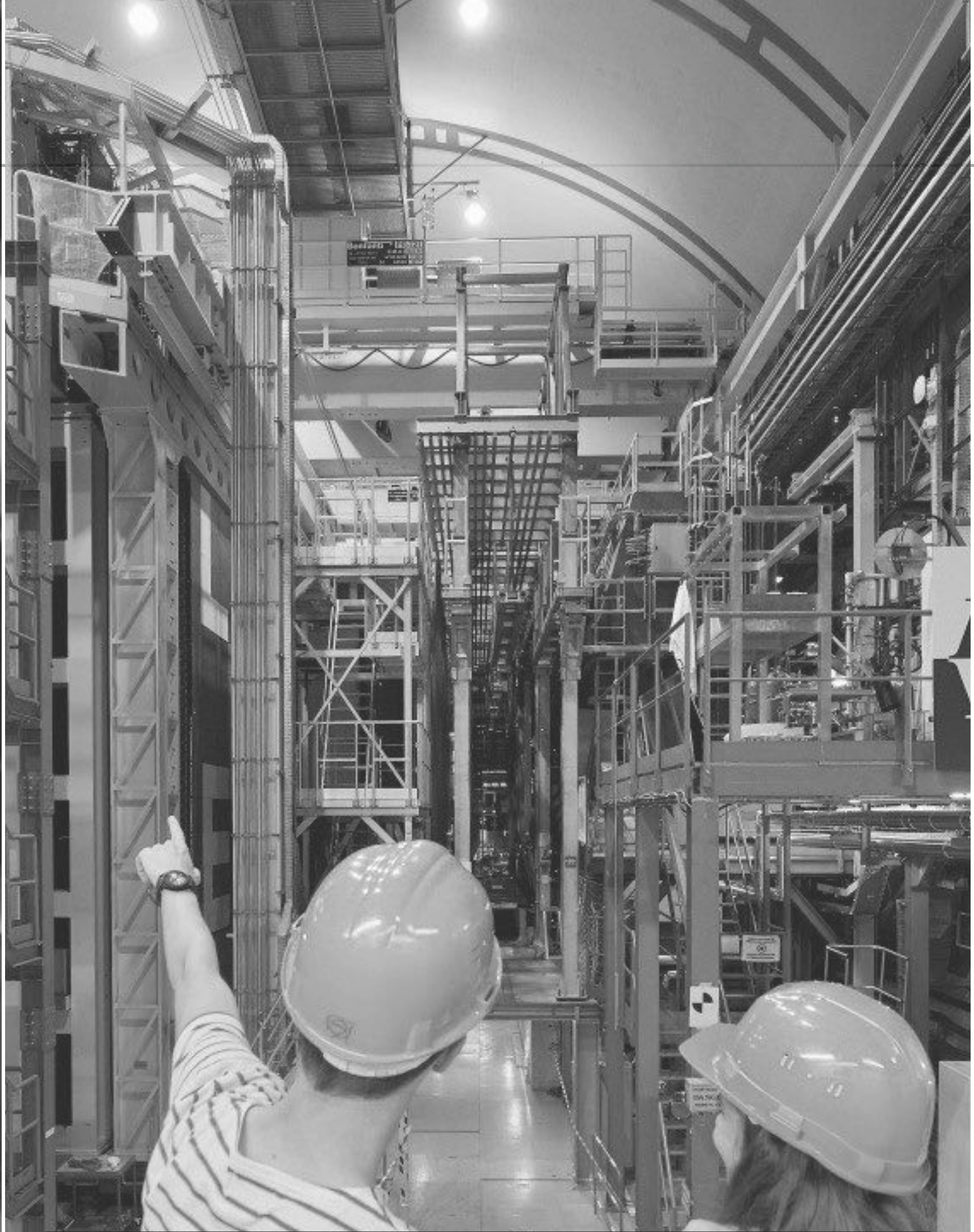


**NEW  
OUTREACH  
MATERIAL**





**VISITS  
AND  
EVENTS**



**COMMUNICATION  
CHANNELS**

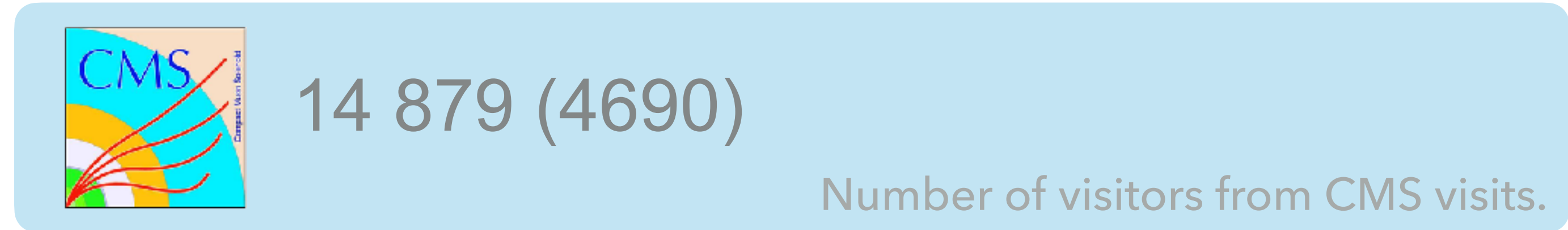


**NEW  
OUTREACH  
MATERIAL**



# VISITS OF THE DETECTORS

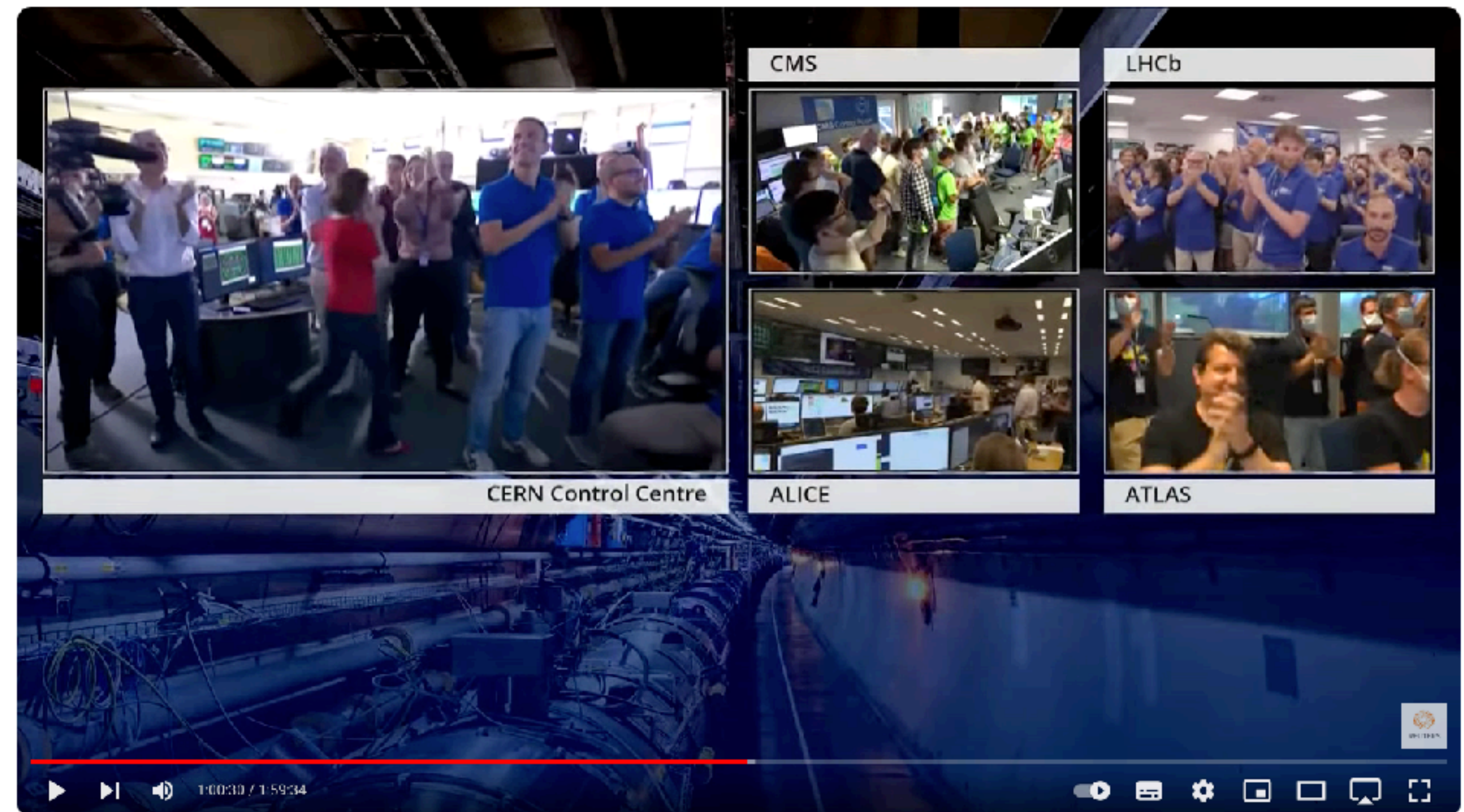
- ▶ Since pandemic, experiment **group visits** are possible again
- ▶ However, also **virtual visits** remain a popular tool to reach students/viewers who cannot easily travel to CERN, and to organise visits when access to the public is difficult to arrange
- ▶ During YETS 2023-2024, experiments scheduled and organised large number of group (virtual) visits:





# LIVE EVENT: FIRST COLLISIONS AT 13.6 TEV

- ▶ One of the biggest outreach events across all four main experiments in the past years
- ▶ The event was streamed on CERN's social media channels in five languages (English, German, Italian, French, Spanish)
- ▶ More than 1 million views on CERN's YouTube (English version)!



LIVE: Launch of CERN's Large Hadron Collider Run 3

Relive the experience [here!](#)



# LIVE EVENT: FIRST COLLISIONS AT 13.6 TEV



ALICE

[webpage article](#)



[webpage article](#)



[webpage article](#)



[webpage article](#)



# SOME MORE LIVE EVENTS



LIVE: from the CERN Control Centre with the four largest LHC experiments

CERN 216.000 Abonnenten Abonnieren 324 Teilen Clip

## ▶ “Lead Ion Run at the LHC”

- ▶ Discussions with experts of all four large experiments about collected data in 2023

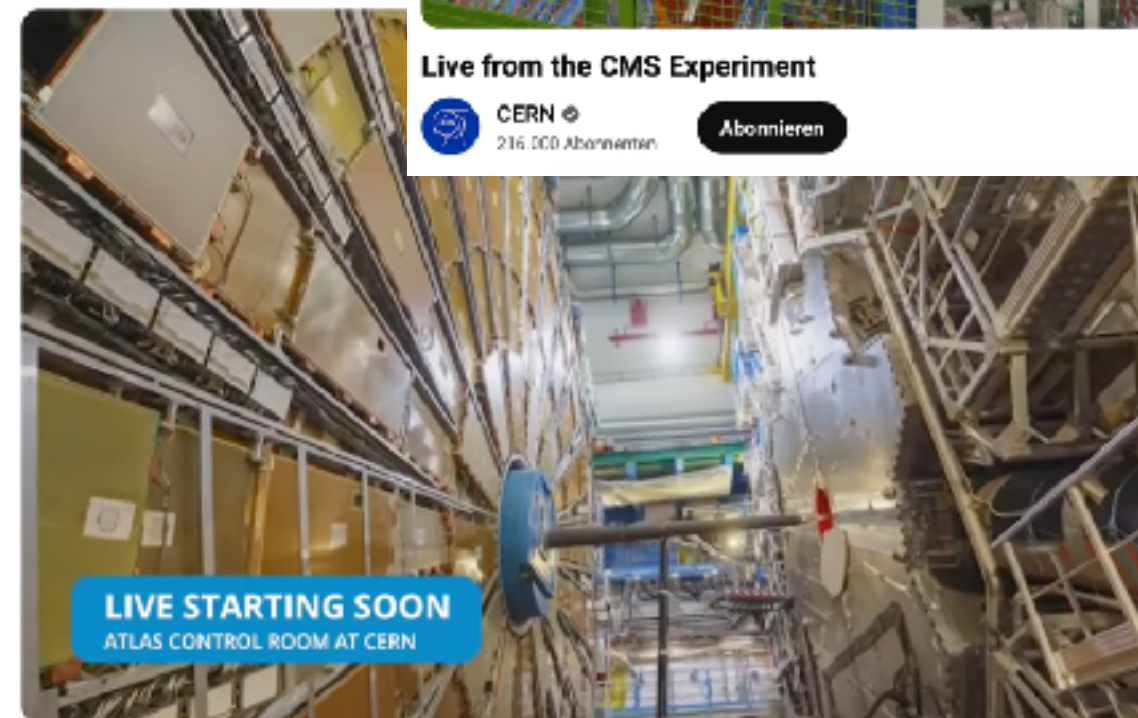


Live from the CMS Experiment

CERN 216.000 Abonnenten Abonnieren 313 Teilen



alice\_experiment Instagram live this evening at 6PM from the ALICE underground cavern at @cern :  
(Thursday 1 February 2024 at 18:00 hrs CERN time!)  
Join us through the Instagram app from your smartphone by going to the ALICE experiment account @alice\_experiment Looking forward to talking to you soon!



Live from CERN: Behind the scenes at the ATLAS Experiment Control Room

CERN 216.000 Abonnenten Abonnieren 245 Teilen



We are Live from the LHCb Experiment

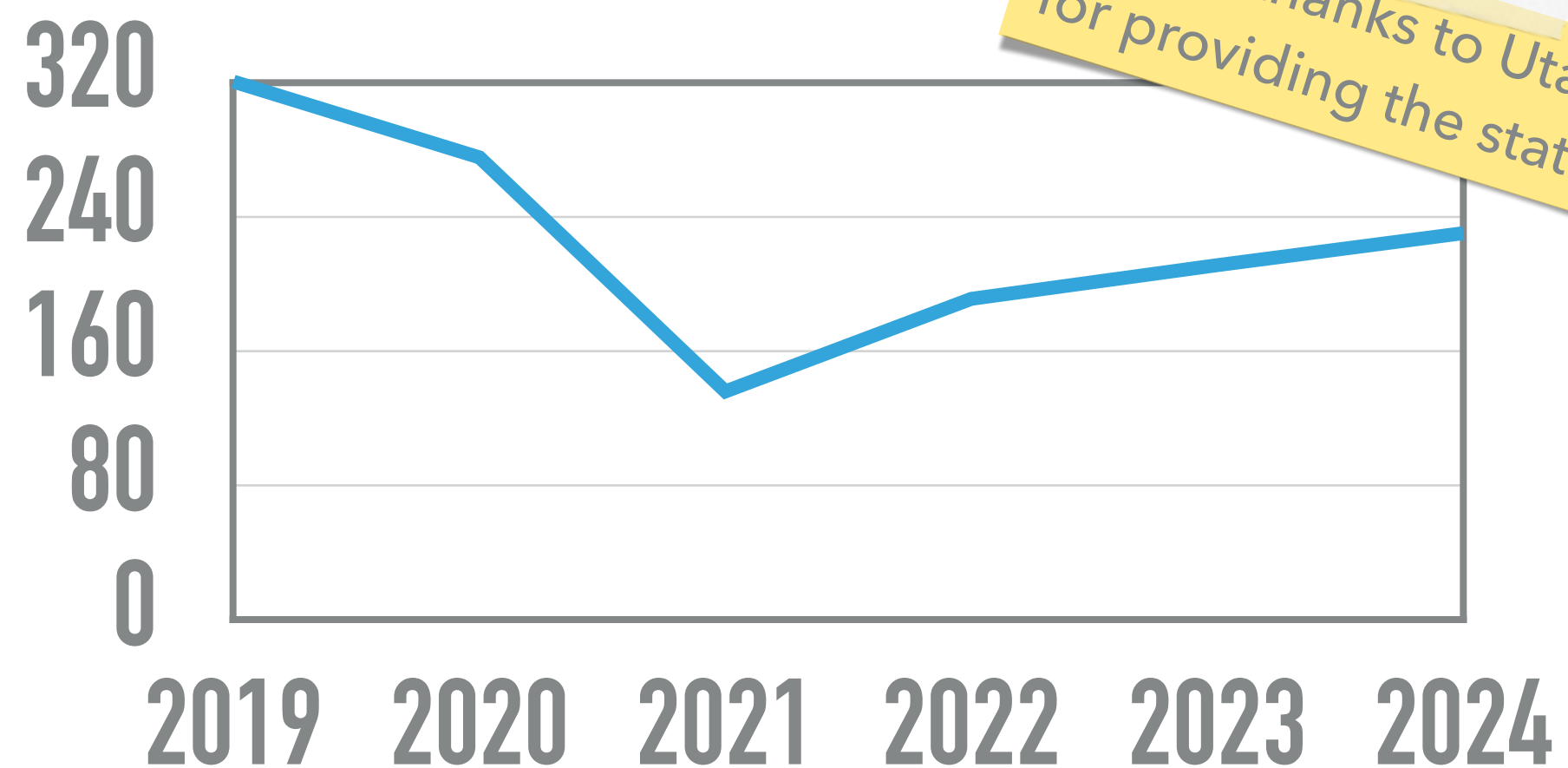
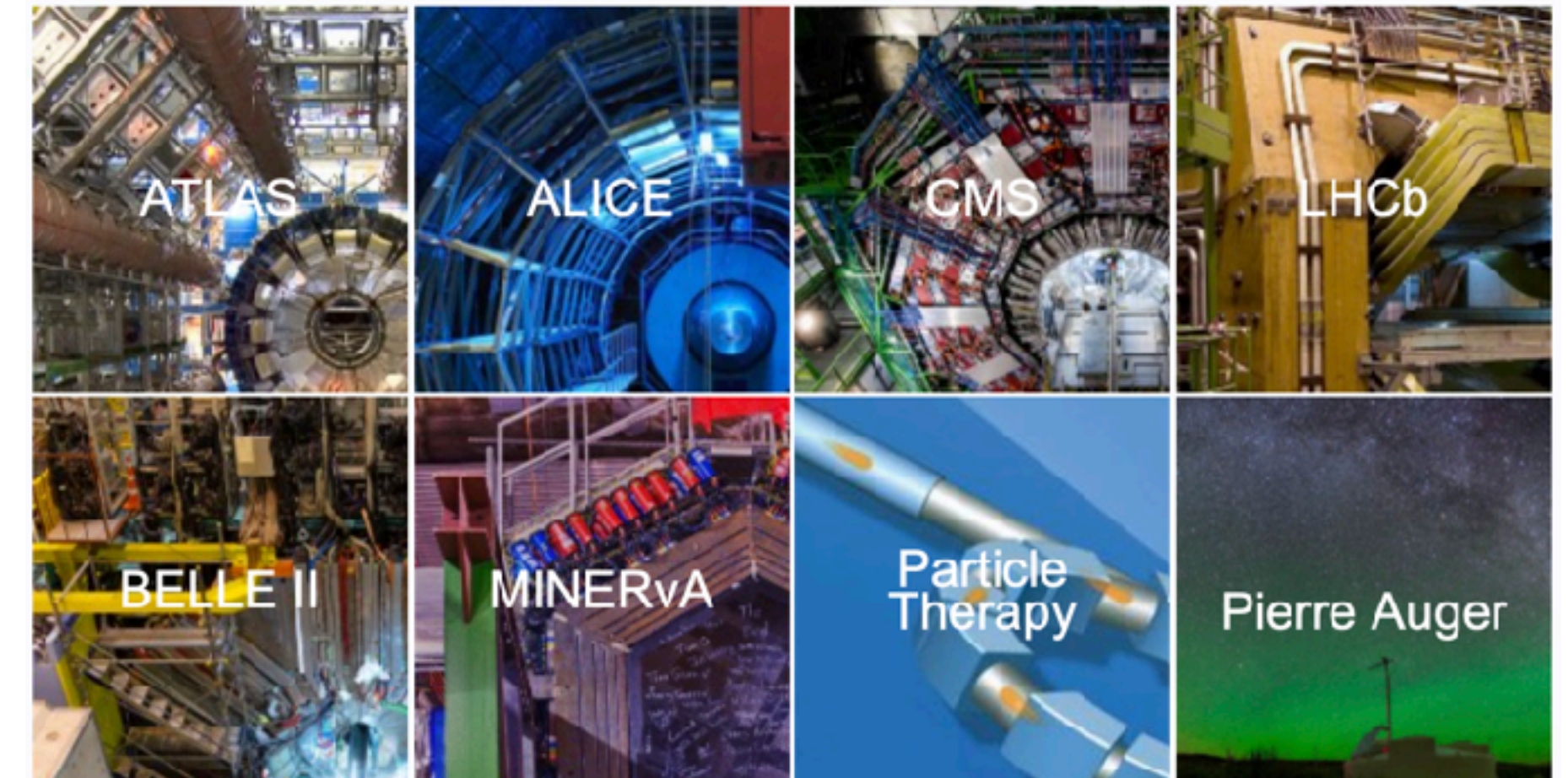
CERN 216.000 Abonnenten Abonnieren 375 Teilen Clip

- ▶ Live events from [ALICE](#), [ATLAS](#), [CMS](#) and [LHCb](#) to explain what experiments are looking for, introduce Run 3 detector upgrades, and show detectors



# INTERNATIONAL MASTERCLASSES

- ▶ Idea behind the [IMC](#): give students the possibility to become physicists for a day
- ▶ Since 2021 we saw continuous increase in the participation in the CERN LHC Masterclasses
- ▶ Becoming compatible again to pre-Covid attendance



Special thanks to Uta Bilow for providing the statistics!

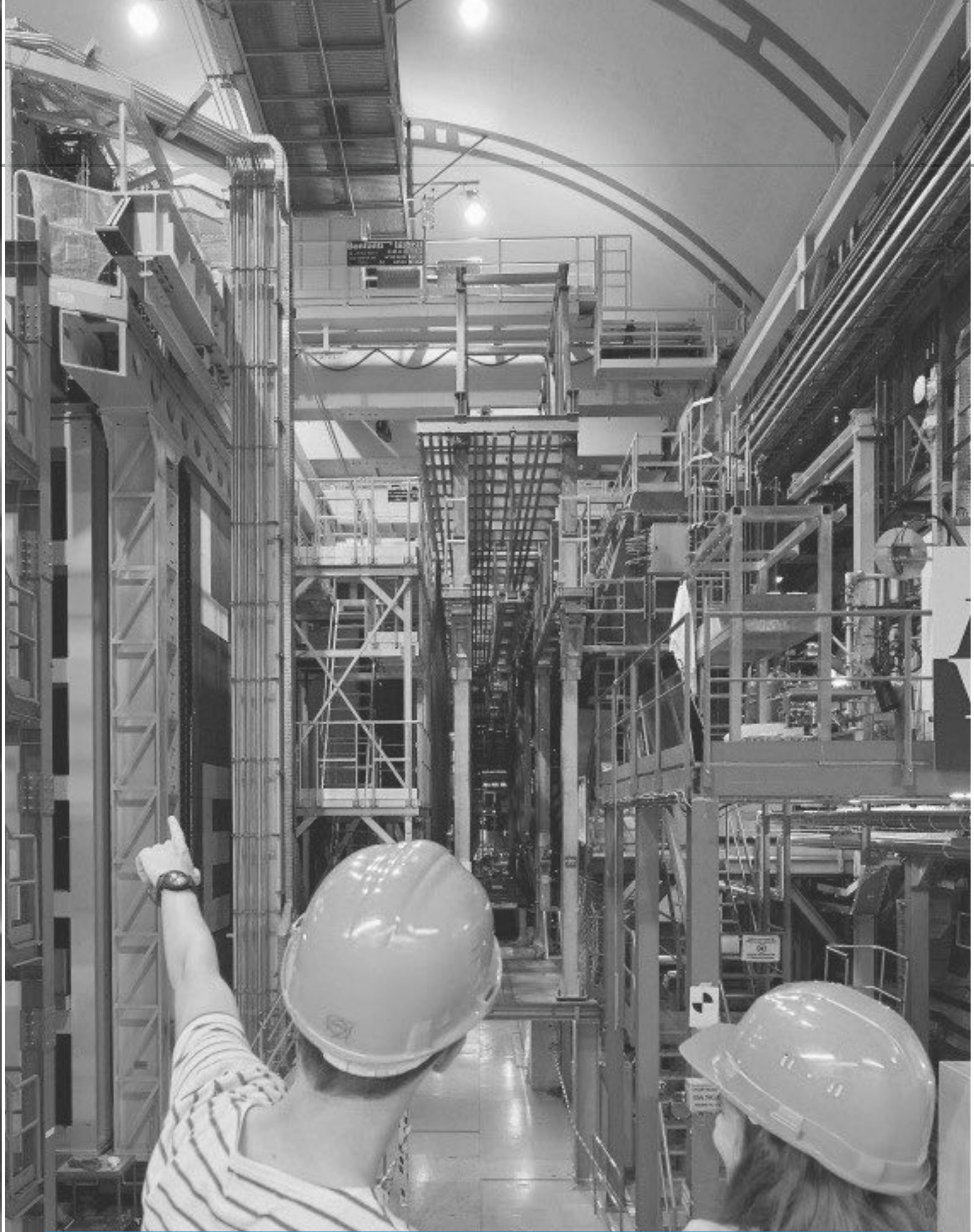
■ **Hands on Particle Physics Masterclasses**  
■ **INTL. DAY OF WOMEN AND GIRLS IN SCIENCE**

- ▶ Special MC organised only for girls with CERN videoconference
- ▶ Moderators in 2024 from ATLAS, ALICE and CMS





**VISITS  
AND  
EVENTS**



**COMMUNICATION  
CHANNELS**



**NEW  
OUTREACH  
MATERIAL**



# PUBLIC WEBSITES

- ▶ All the public websites are the main source to **display information** concerning detectors, results and news as well as to gather/point to outreach material



[ALICE public page](#)



[ATLAS public page](#)



[CMS public page](#)



[LHCb public page](#)



# SOCIAL MEDIA

- ▶ All four experiments heavily use Social Media for **communication** about important new physics results, detector upgrades and milestones in the physics program
- ▶ Additionally, Social Media has become an **important tool** to let viewers glimpse into the lives of a physicist/technician working in an experiment (e.g. dedicated interview series on Instagram pages, live events etc.)



ALICE



[ALICE.experiment](https://www.facebook.com/ALICE.experiment)  
(22.3k follower)



[alice\\_experiment](https://www.instagram.com/alice_experiment)  
(22.5k follower)



[@ALICE\\_experiment](https://twitter.com/@ALICE_experiment)  
(36.2k follower)



[ALICE Experiment](https://www.youtube.com/ALICEExperiment)  
(108k views, 1k follower)



[ATLASexperiment](https://www.facebook.com/ATLASexperiment)  
(44k follower)



[atlasexperiment](https://www.instagram.com/atlasexperiment)  
(64.4k follower)



[@ATLASexperiment](https://twitter.com/@ATLASexperiment)  
(92.7k follower)



[ATLAS Experiment](https://www.youtube.com/ATLASExperiment)  
(1.4M views, 9.7k follower)



[@atlasexperiment](https://www.tiktok.com/@atlasexperiment)



[CMSexperiment](https://www.facebook.com/CMSexperiment)  
(30.3k follower)



[cmsexperiment](https://www.instagram.com/cmsexperiment)  
(28.9k follower)



[@CMSExperiment](https://twitter.com/@CMSExperiment)  
(58.2k follower)



[CMS Experiment](https://www.youtube.com/CMSExperiment)  
(513k views, 3.9k follower)



[LHCbExperiment](https://www.facebook.com/LHCbExperiment)  
(20.6k follower)



[lhcbexperiment](https://www.instagram.com/lhcbexperiment)  
(17.4k follower)



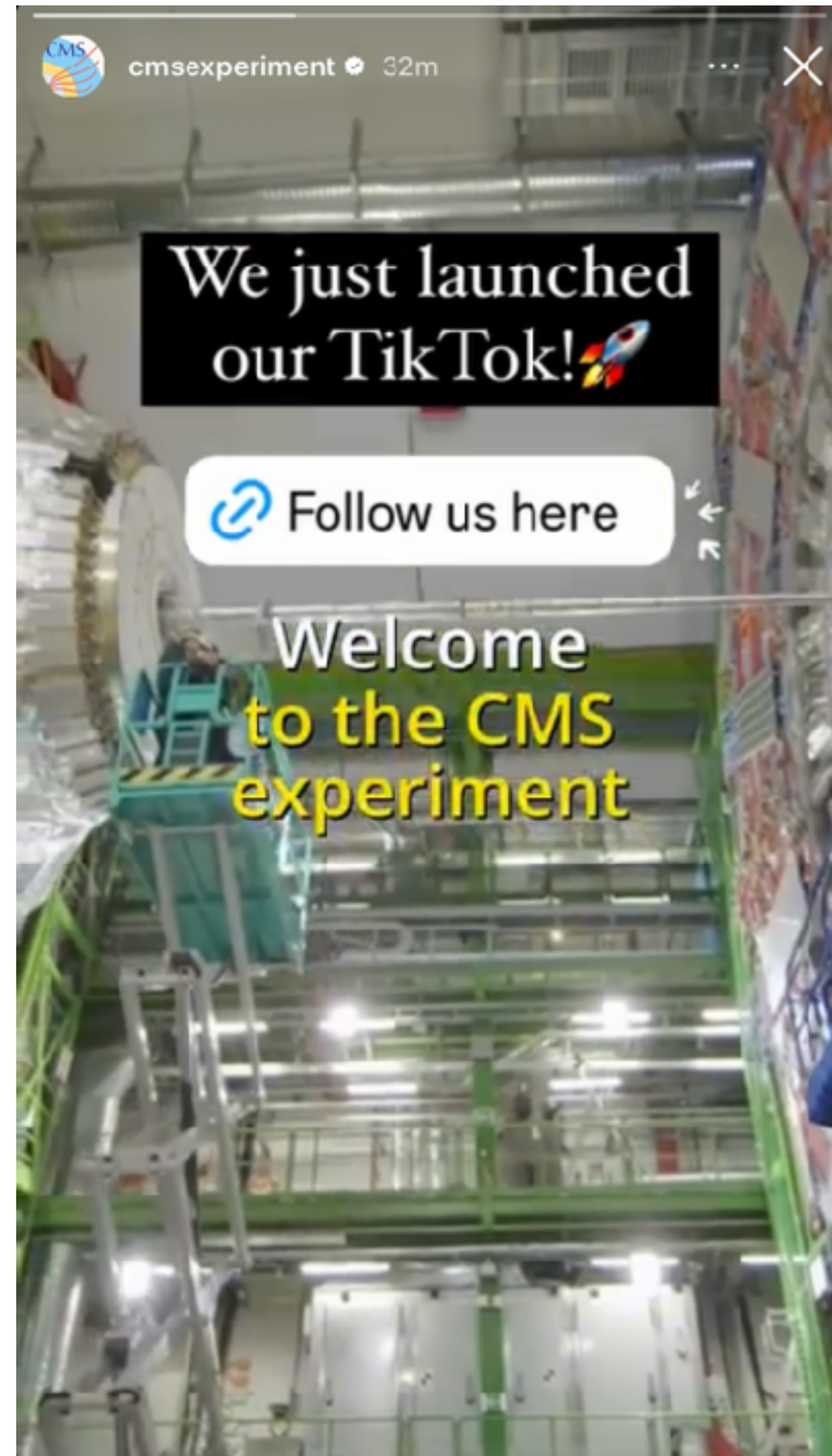
[@LHCbExperiment](https://twitter.com/@LHCbExperiment)  
(30.8k follower)



[LHCb Experiment](https://www.youtube.com/LHCbExperiment)  
(27.6k views, 0.5k follower)



# SOCIAL MEDIA



CMS released their TikTok account on Friday 31.05.2024



[@cms\\_experiment](https://www.tiktok.com/@cms_experiment)



# MOST POPULAR CONTENT ON YOUTUBE OF THE LAST YEARS



**ALICE**

[Link to video](#)



**ALICE at CERN Point-2: Exhibition Video**

1.1K views • 2 years ago

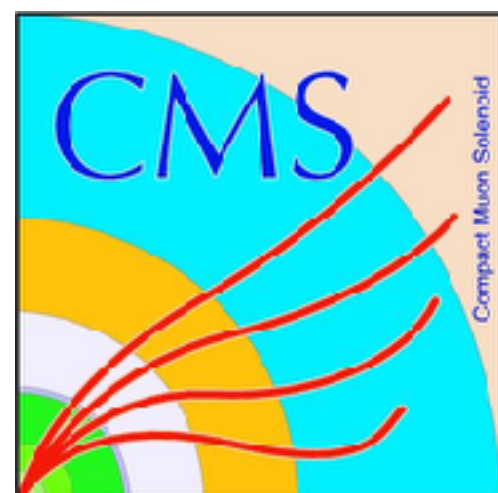


[Link to video](#)



**Particle Detectors for a New Era: Building the ATLAS New Small Wheel**

2.8K views • 2 years ago



[Link to video](#)



**Introducing the CMS Experiment at CERN**

18K views • 3 months ago



[Link to video](#)

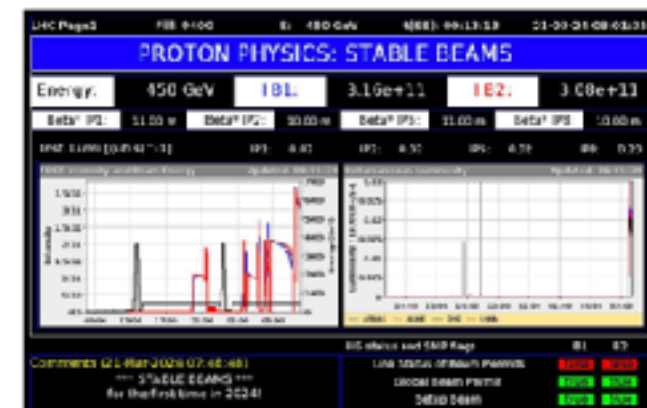


**LHCb Upstream Tracker (UT) being moved 100m underground**

298 views • 1 year ago



# MOST POPULAR CONTENT ON INSTAGRAM OF THE PAST YEARS



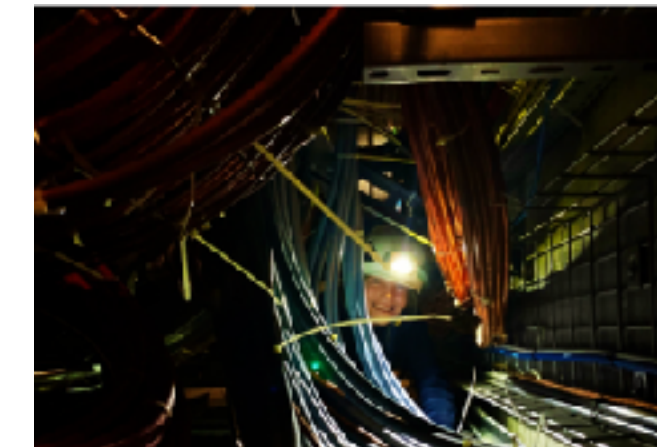
**alice\_experiment** This morning, the Large Hadron Collider at CERN delivered THE FIRST STABLE BEAMS of 2024 (at the injection energy).

In ALICE: we are all super excited as all the detectors are happily taking data.

#cern #physics #particlephysics #quantum #quantummechanics #quantumphysics

9 w

[Link to post](#)



**atlasexperiment** Hey, we didn't see you there!

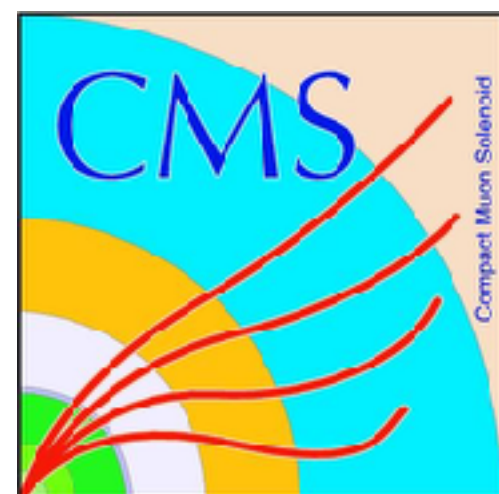
This is how the toroid cleaning went at end of yearly technical shutdown. There are many cables down in the ATLAS cavern!

👤: Goldfarb, Steven

#ATLASexperiment #CERN #LHC #physics #particlephysics #lovephysics #physicslovers #physicsiscool #SciencePhotography #scienceisbeautiful #technology #engineering #research #stem #lightattheendofthetunnel #light #dark #cleaning

33 w

[Link to post](#)



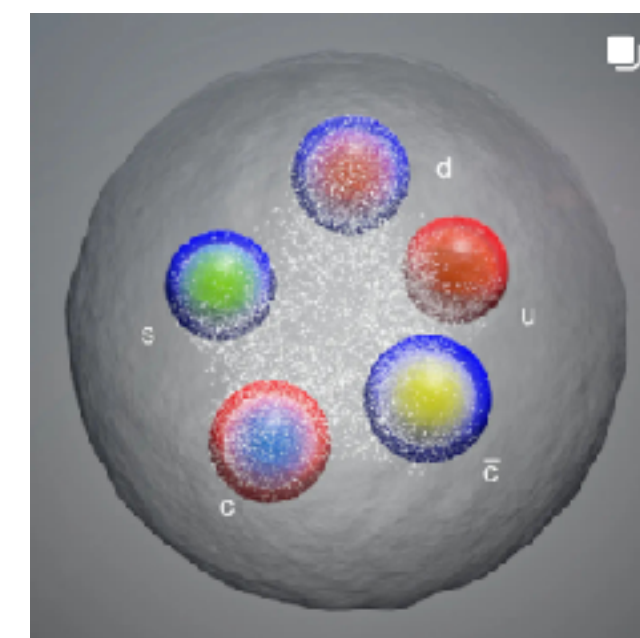
**cmsexperiment** Look **UPI** The M in CMS stands for Muon, and Archana tells us about a new part of the CMS detector that looks for these muons!

Did you know that there are 144 of these GEM detectors inside CMS?

#CERNScienceGateway @cern

22 w

[Link to post](#)



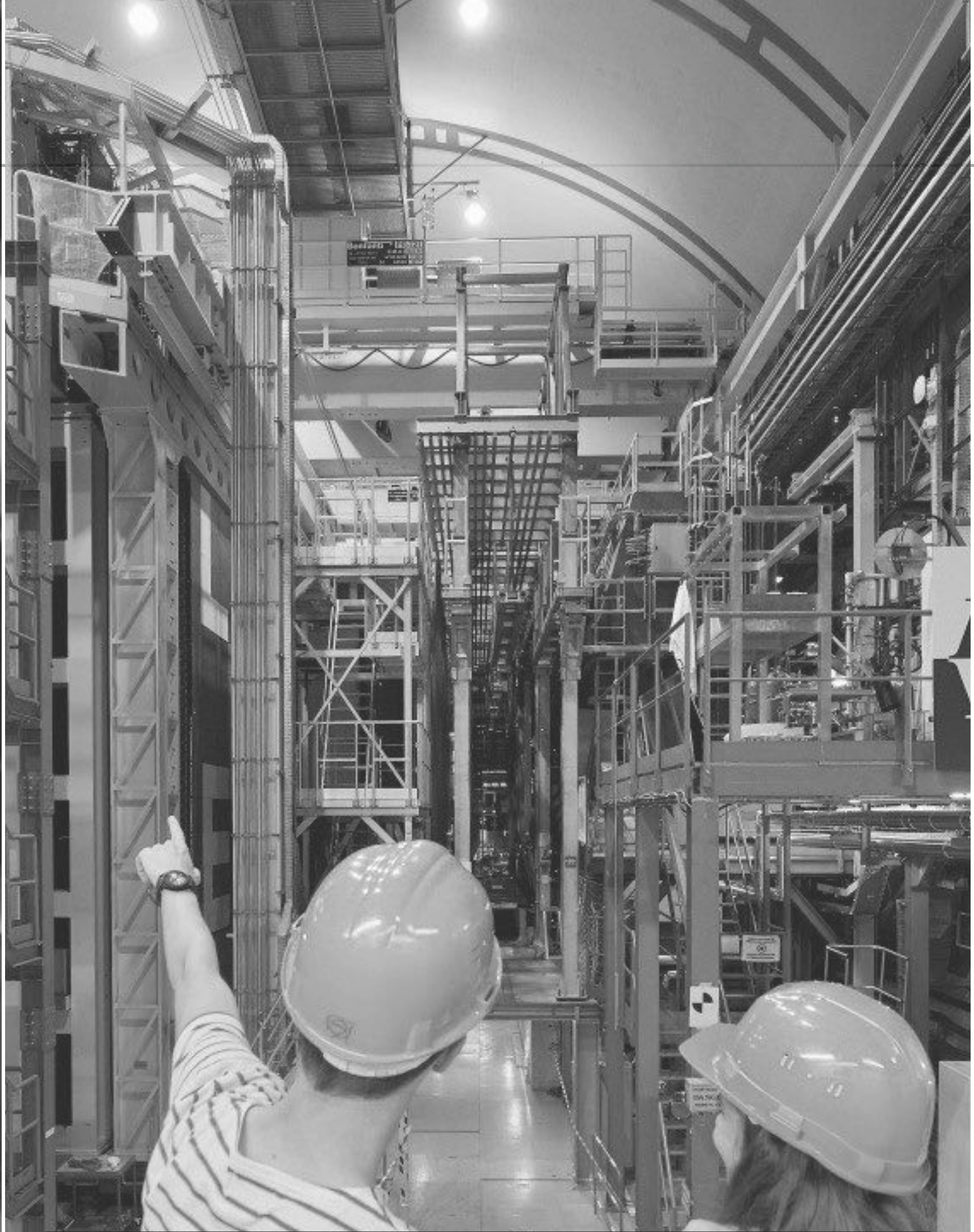
**lhcbexperiment** New additions to the particle zoo: a pentaquark and two tetraquarks!

[Link to post](#)





**VISITS  
AND  
EVENTS**



**COMMUNICATION  
CHANNELS**



**NEW  
OUTREACH  
MATERIAL**



# NEW OPEN DATA RELEASED

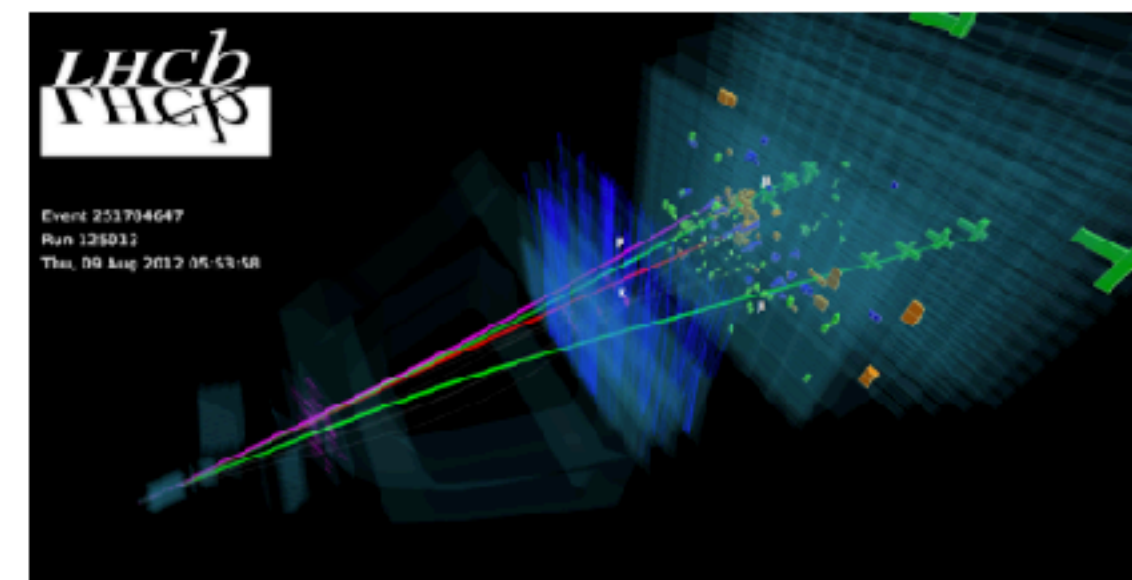
- ▶ The CMS and LHCb collaborations have released their entire Run I proton-proton datasets (CMS in 2022 and LHCb in 2024)
- ▶ CMS also organises its [5th annual open data workshop and hackathon](#) this July!
- ▶ These workshops make it possible for non-CMS members to benefit from the released datasets!

LATEST POSTS OTHER PHYSICS RESULTS

## LHCb releases the entire Run I dataset

By [pietryk](#)  
 DEC 20, 2023

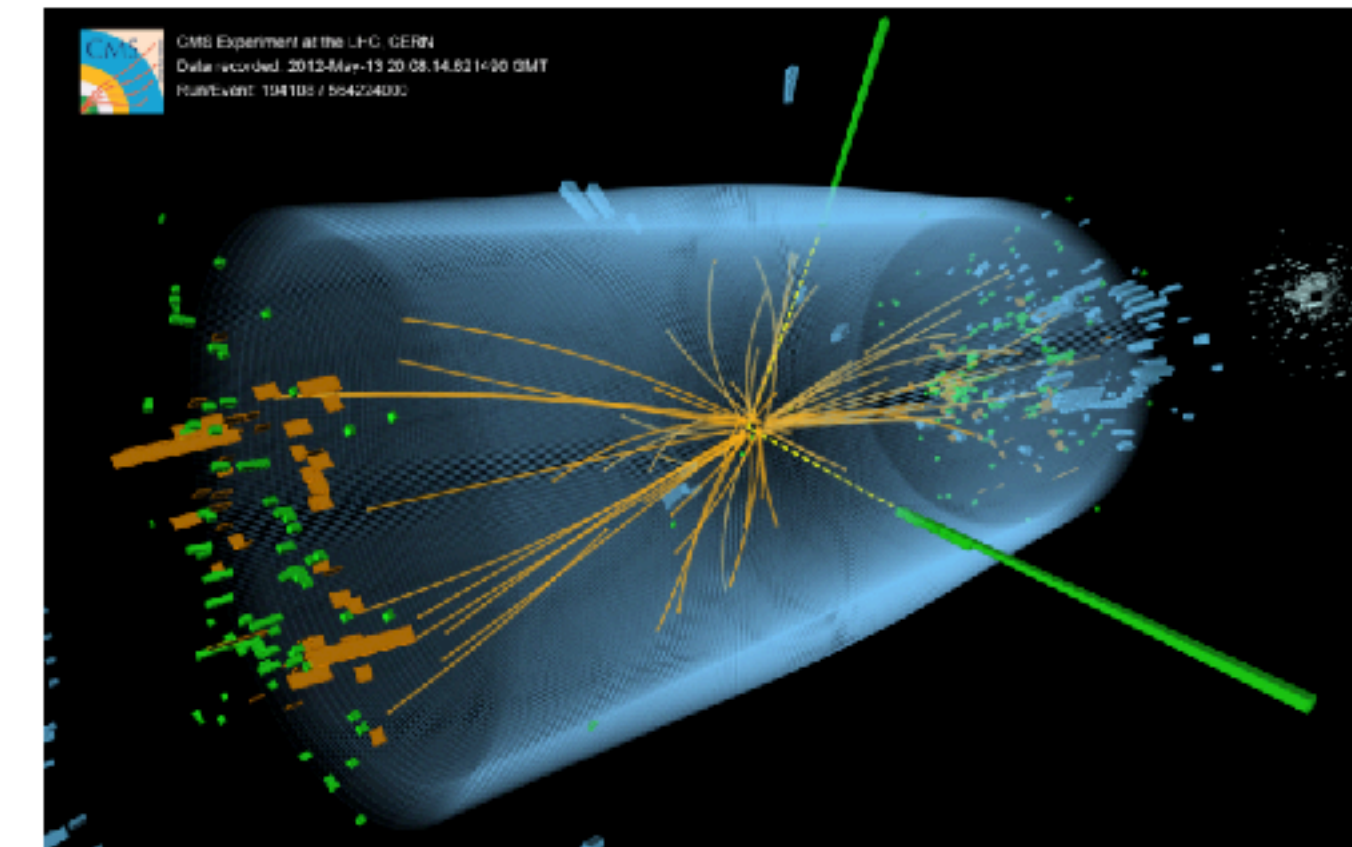
Today the LHCb collaboration complete the release of data collected throughout the Run I of the Large Hadron Collider at CERN. The sample made available amounts to approximately 800 terabytes (TB) of data. These data, collected by the LHCb experiment in 2011 and 2012, contain information obtained from proton-proton collisions[1]. The format made available provides pre-filtered data, suitable for a wide range of physics studies. The image below displays an event recorded during 2012.



## CMS releases Higgs boson discovery data to the public

The collaboration has also made publicly available the software that it developed to search for the unique particle

16 APRIL, 2024 | By CMS collaboration



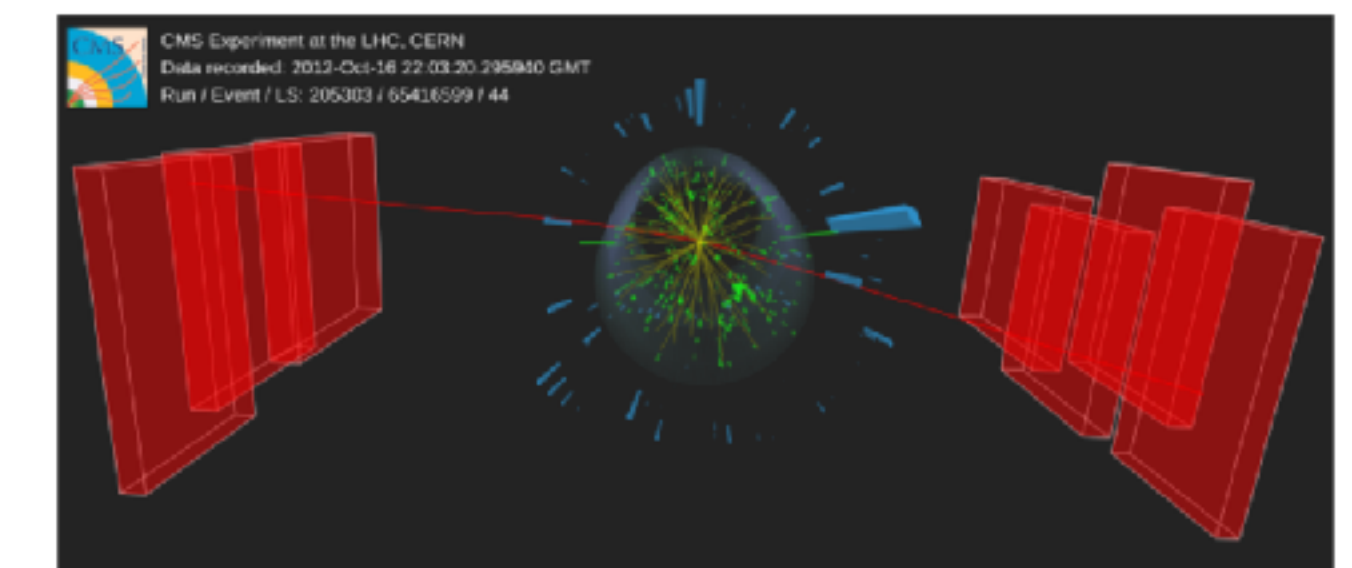
CMS event display of a candidate Higgs boson decaying into two photons, one of the two decay channels that were key to the discovery of the particle. (Image: CERN)

As part of its continued commitment to making its science fully open, the CMS collaboration has just [publicly released](#), in electronic format, the combination of CMS measurements that contributed to establishing the discovery of the [Higgs boson](#) in 2012. This release coincides with the publication of the Combine software – the statistical analysis tool that CMS developed during the first run of the [Large Hadron Collider](#) (LHC) to search for the unique particle, which has since been adopted throughout the collaboration.

## CMS completes the release of its entire Run 1 proton-proton data

CMS has now released the complete set of proton-proton data taken from LHC Run 1, including the original findings used in the Higgs boson discovery

14 DECEMBER, 2022 | By CMS collaboration



A collision event recorded by CMS in 2012, available in the latest release of CMS open data (Image: CERN)



# NEW OPEN DATA RELEASED

- ▶ ATLAS released a [YouTube series](#) to explain how to analyse the released open datasets in September 2021
- ▶ Explanations go from how to use Jupyter notebooks to installing virtual machines up to creating Histograms in PyROOT



**FIND THE HIGGS**  
OPEN DATA TUTORIAL

**ATLAS Open Data Tutorials**

ATLAS Experiment  
7 videos 3,099 views Last updated on 27 Sept 2021

⋮ ↗

▶ Play all ⌛ Shuffle

Video tutorials explaining different ways to use Open Data from the ATLAS Experiment at CERN.



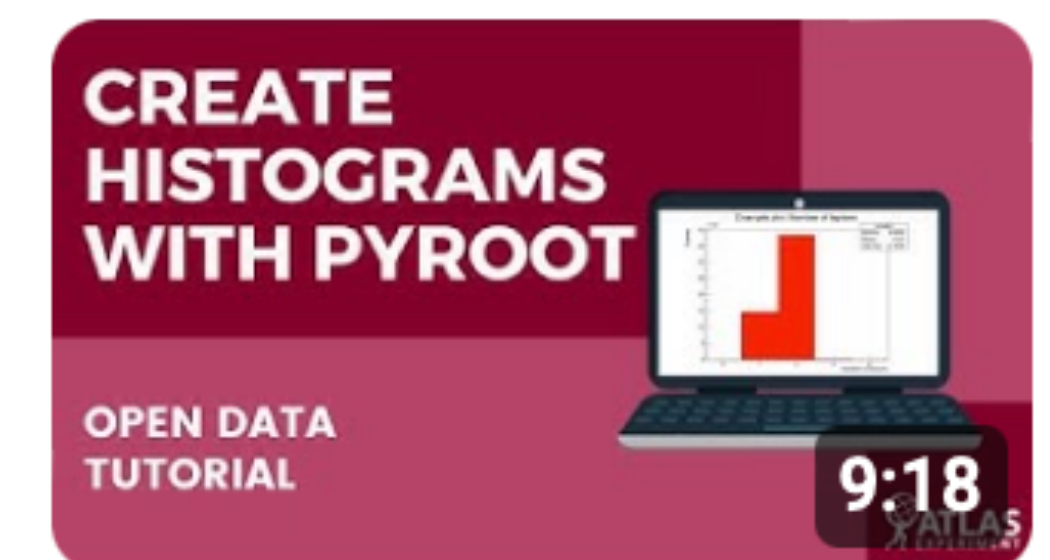
**INTRO TO JUPYTER**  
OPEN DATA TUTORIAL

4:26



**INSTALL A VIRTUAL MACHINE**  
OPEN DATA TUTORIAL

9:47



**CREATE HISTOGRAMS WITH PYROOT**  
OPEN DATA TUTORIAL

9:18



# NEW SURFACE EXHIBITION AT LHCB

- ▶ LHCb has inaugurated its new [surface exhibition](#) in 2023!
- ▶ The exhibition consists of a **multimedia show**, highlighting the particle trajectories through the different sub-detector systems, and hosts several detector parts of every sub-detector system



## Discover the new LHCb exhibition

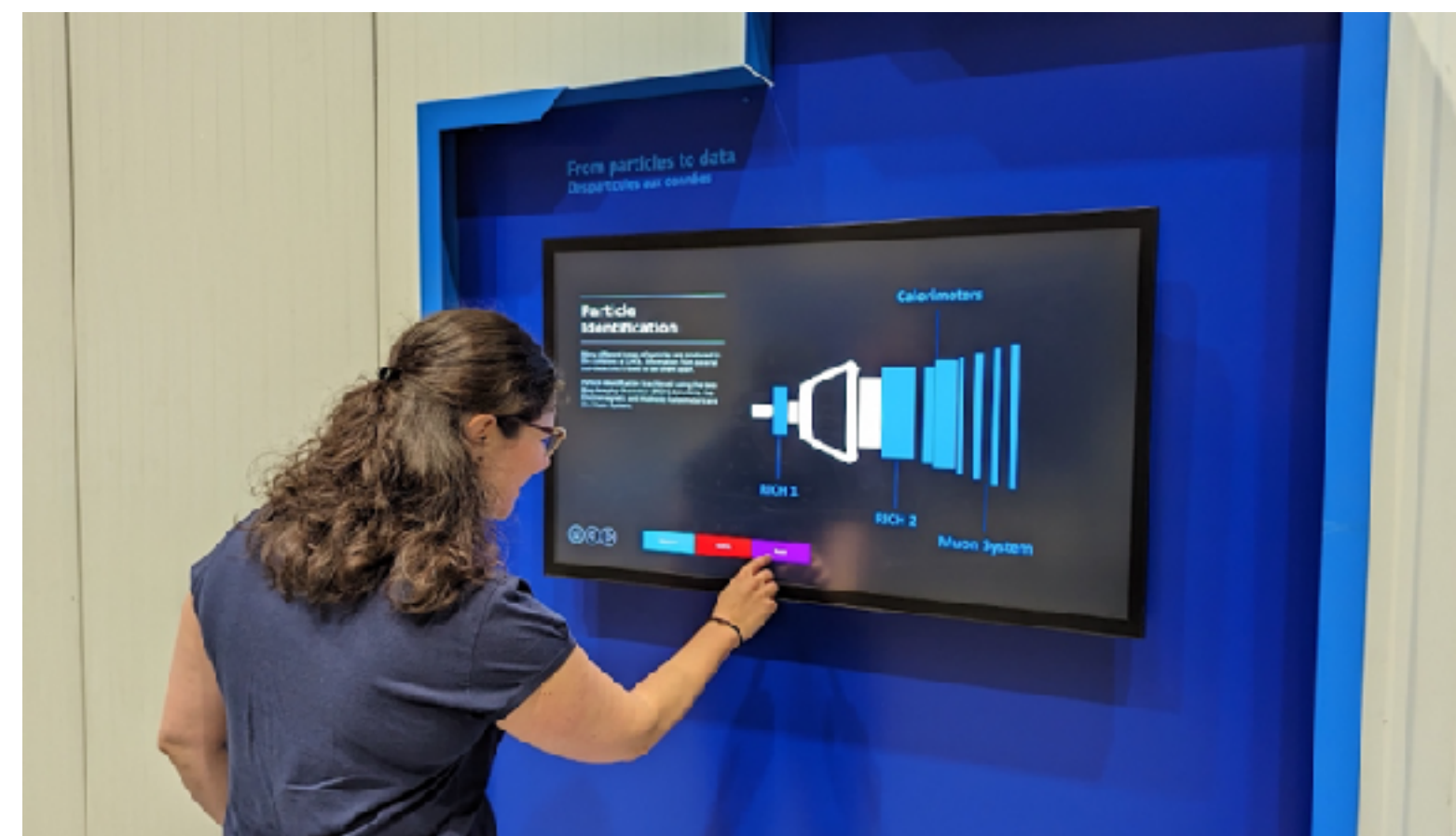
CERN's Exhibitions section and LHCb have teamed up to overhaul the experiment's public exhibition, which is now open to visitors – don't miss it!

7 MARCH, 2023 | By Sanje Fenkart



The cinema room with its immersive walk explains how LHCb operates. (Image: Gai Durne Mac Pietrzyk)

The CERN Exhibitions section (IR-ECO-EXH) and the LHCb experiment have developed a new public experience at LHC Point 8, in Ferney-Voltaire (France), where the experiment is located. The design phase of the new exhibit, carried out in collaboration with the Spanish design firm [Indissoluble - The Exhibition Factory](#), which previously worked on the ALICE and Microcosm exhibitions, started in autumn 2020. Last December, only two years later, the installation was already completed and about to welcome its first visitors. The new exhibition has indeed been open to the public since the beginning of the year, and was officially inaugurated on 3 March.





## SUMMARY

- ▶ Outreach has “normalised” after pandemic, with **in-person visits** and **events** happening again
- ▶ **Virtual** and **live events** are still very important tools
  - ▶ We can successfully take profit from our experience of the pandemic years to make the organisation of such events very smooth
- ▶ **New online material** helps to reach more people, e.g. from remote geographical areas and from different social backgrounds
- ▶ Each of us is an important part of making outreach possible!  
**Thank you everybody who is actively engaging in any kind of outreach activities!**