

# HB 2023

68th ICFA Advanced Beam Dynamics Workshop on  
High-Intensity and High-Brightness Hadron Beams

CERN, European Organization for Nuclear Research  
Geneva, Switzerland 9-13 October 2023



hb.2023@cern.ch



Chair : E. Metral  
Co-Chair : S. Gilardoni  
Assistants : M. Alegria  
S. Martakis  
A. Valenza

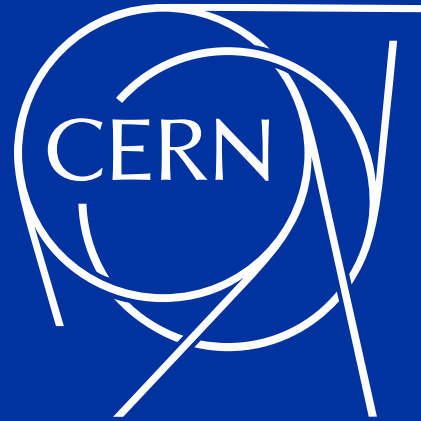
IOC, LOC and EB :  
<https://indico.cern.ch/e/HB2023>

#### Working Groups

Beam Dynamics in Rings  
Beam Dynamics in Linacs  
Accelerator Systems  
Operations and Commissioning  
Beam Instrumentation and Intercepting Devices

#### Deadlines

Abstract submission 15 July 2023  
Registration 15 September 2023  
Paper submission 1 October 2023



# HB2023 @ CERN Conclusions

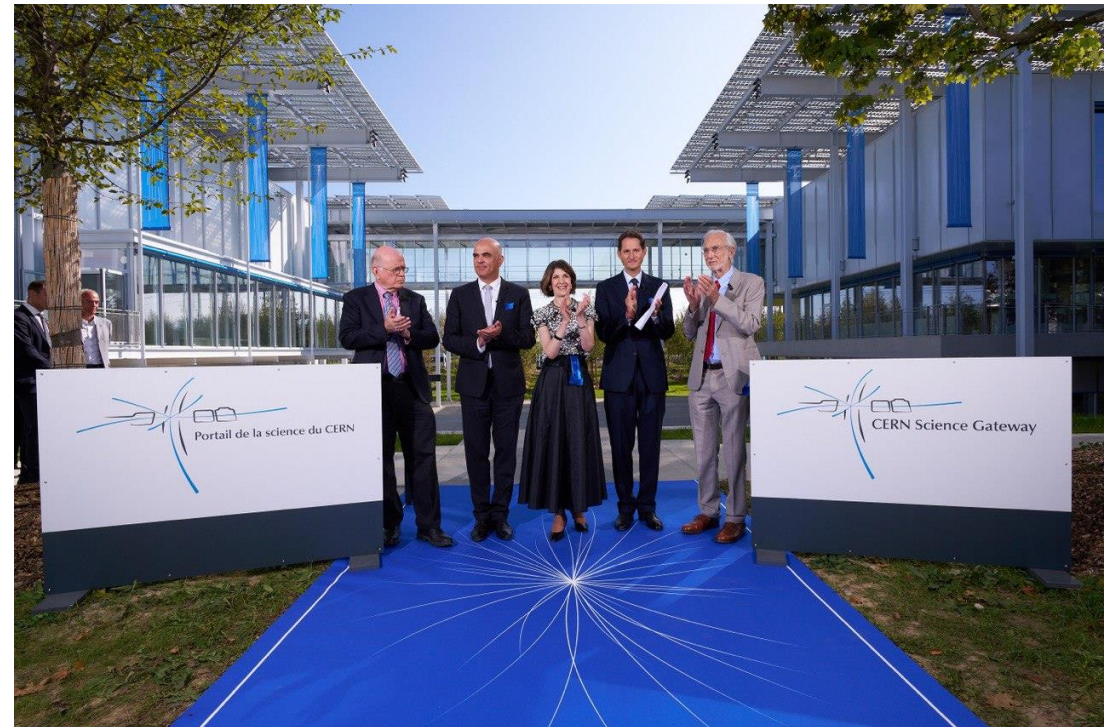
S. Gilardoni, E. Metral - CERN

# Starting from the end

- **Thanks you to all of you for these:**
  - ~ 180 000 000 ms of vibrant and interesting discussions (vibrant and intense...)
  - 173 abstracts
  - 67 Invited talks
  - 41 contributed talks
  - 65 posters with 11 FLASH presentations
- **Thanks to all the HB previous organizers for the precious advice**
  - And for gathering such excellent community
- **What else contributed to the workshop ....**

# The Venue

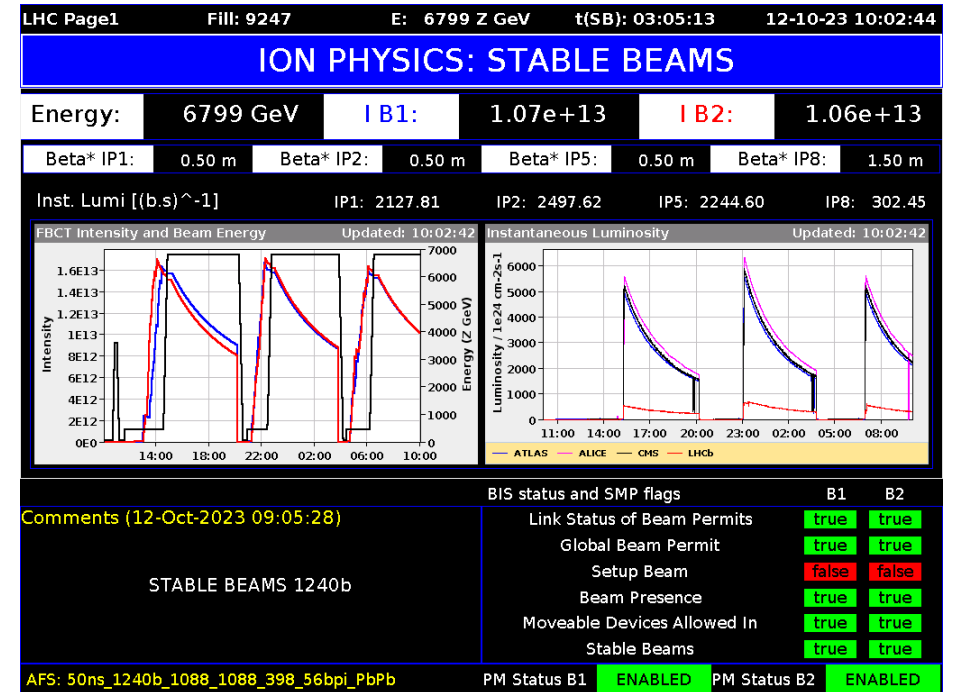
- **Change in program due to too close inauguration of Science Gateway**
- **Site still in “commissioning” phase and moving into “operation” (any suggestion from WGD?)**



# The HIGGS discovery announcement in the Main Auditorium



# “What we can offer” Highest energy Pb collisions ever realised



## International conference on high-energy accelerators and instrumentation

14<sup>th</sup> – 19<sup>th</sup> September 1959 at CERN

From the proceedings

No status report on the CERN Proton Synchrotron was presented at the Conference: instead, the participants were invited to visit the P.S. Division on the evening of September 15th, and were shown the machine.

During the Conference, studies of the injected beam in the synchrotron were in progress, and on September 16th this beam made one revolution of the vacuum chamber for the first time.

The first circulating beam in a strong-focusing proton synchrotron



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# Workshop organization



Two experts in the field of the related WG

## WG Conveners

## LOC: Local Organising Committee

- Chiara Bracco (Chair)
- Hannes Bartosik
- Sergio Calatroni
- Marco Calviani
- Edda Gschwendtner
- Alexander Huschauer
- Verena Kain
- Jean-Baptiste Lallement
- Giovanni Rumolo
- James Storey
- Helga Timko
- Jan Uythoven

+ Technical and procurement supports

## EB: Editorial Board

- Jan Chrin (PSI)
- Massimo Giovannozzi (CERN)
- Dong-Eon Kim (PAL)
- Marten Henrik Koopmans (CERN)
- Anton Lechner (CERN)
- Philippe Schoofs (CERN)

<b>WGA</b> Beam Dynamics in Rings	EMEA	Giovanni Rumolo, CERN, Switzerland
	America	Jean-Luc Vay, LBNL, USA
	Asia	Na Wang, IHEP, China
<b>iB</b> Beam Dynamics in Linacs	EMEA	Frédéric Bouly, LPSC, France
	America	Nick Evans, ORNL, USA
	Asia	Hongwei Zhao, IMP, China
<b>WGC</b> Accelerator Systems	EMEA	Shinji Machida, RAL, U.K.
	America	Haixin Huang, BNL, USA
	Asia	Pranab Saha, J-PARC, Japan
<b>WGD</b> Operations and commissioning	EMEA	Natalia Milas, ESS, Sweden
	America	Mei Bai, SLAC, USA
	Asia	Sheng Wang, IHEP, China
<b>WGE</b> Beam Instrumentation and Intercepting Devices	EMEA	Peter Forck, GSI, Germany
	America	Patrick Hurh, FNAL, USA
	Asia	Kenichirou Satou, J-PARC/KEK, Japan

Thank to all of you for the excellent work



# IOC: International Organising Committee

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### Chair of the International Organising Committee:

Yunhai Cai, SLAC National Accelerator Laboratory, USA

### Members:

Mei Bai, SLAC, USA

Yuri Batygin, Los Alamos National Laboratory, USA

Michael Blaskiewicz, BNL, USA

Oliver Boine-Frankenheim, TU, Darmstadt, Germany

Sarah Cousineau, Oak Ridge National Laboratory, USA

Mamad Eshraqi, ESS, Sweden

Shinian Fu, Institute of High Energy Physics, China

Eliana Gianfelice-Wendt, Fermilab, USA

Simone Gilardoni, CERN, Switzerland

Hideaki Hotchi, KEK, Japan

Ji-Ho Jang, IBS, Institute for Basic Science, Korea

Dong-O Jeon, Institute for Basic Science, Korea

Daniela Kiselev, PSI, Switzerland

Srinivas Krishnagopal, BARC, India

Elias Métral, CERN, Switzerland

Jean-Michel Lagniel, GANIL, France

Maura Migliorati, Sapienza University of Rome, Italy

Yoshiharu Mori, Kyoto University, Japan

Tatiana Pieloni, EPFL, Switzerland

Andrea Pisent, INFN, Italy

Christopher Prior, STFC, UK

Ji Qiang, Lawrence Berkeley National Laboratory, USA

Pranab K. Saha, J-PARC, Japan

Todd Satogata, Jefferson Lab, USA

Mike Seidel, PSI, Switzerland

Jingyu Tang, USTC, University of Science and Technology, China

Ursula van Rienen, University of Rostock, Germany

Jiuqing Wang, IHEP, Institute of High Energy Physics, China

Ji Wei, Michigan State University, USA

Yoshishige Yamazaki, FRIB/MSU, USA

Xueqing Yan, PKU, Peking University, China

Hongwei Zhao, IMP, Institute of Modern Physics, China



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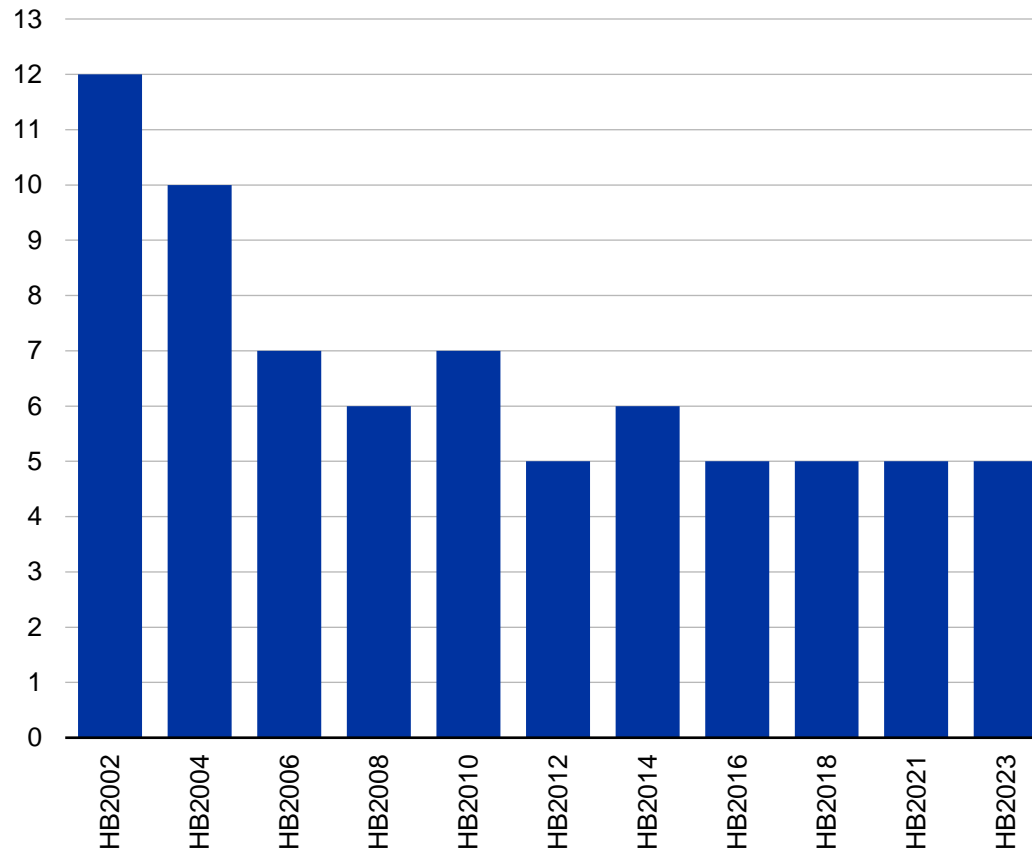
13.10.2023

S. Gilardoni, E. Metral - Conclusion talk

# Scientific content

IOC decision to keep last few editions WG topics

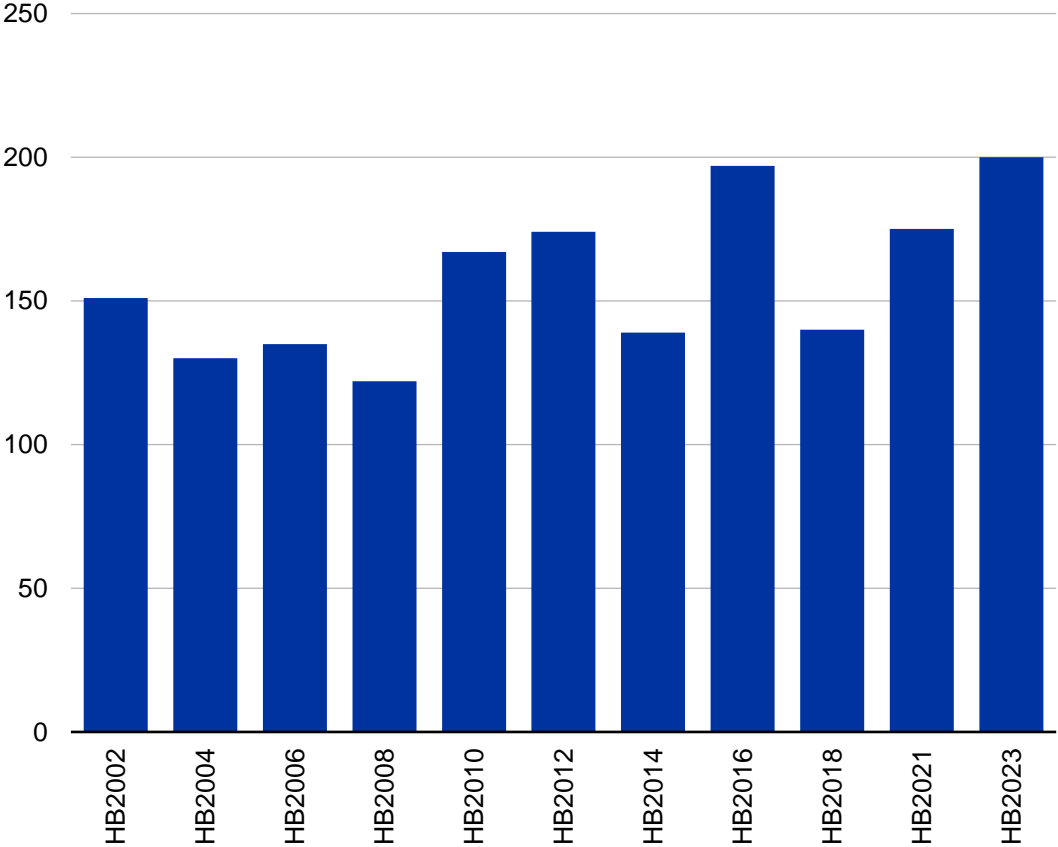
Decided not to have a specific WG on SW/Machine Learning





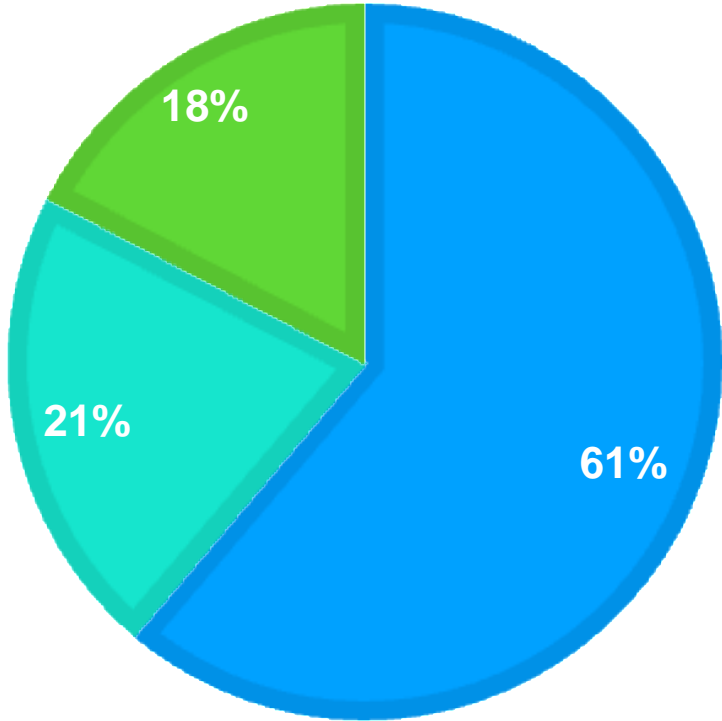
# Participant Stats

Participants



## ORIGIN

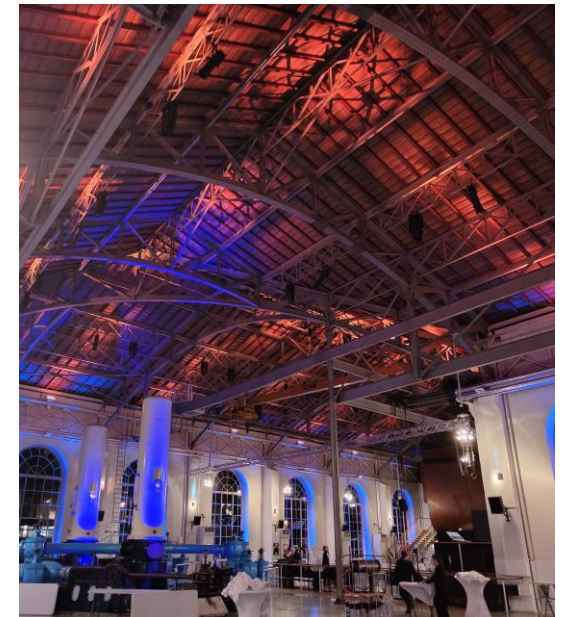
■ Europe ■ Asia ■ America



# Poster session and Banquet at the BFM\*

**BFM - Bâtiment des Forces Motrices**

**Location partially financed by Geneva**



# The “other” concert



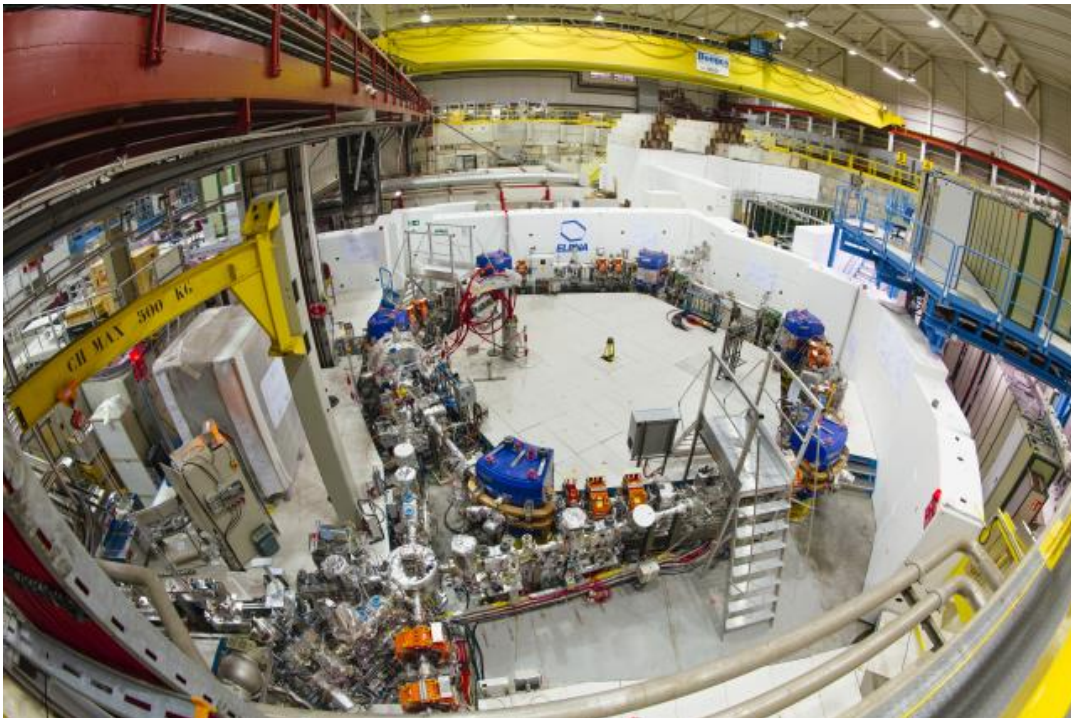
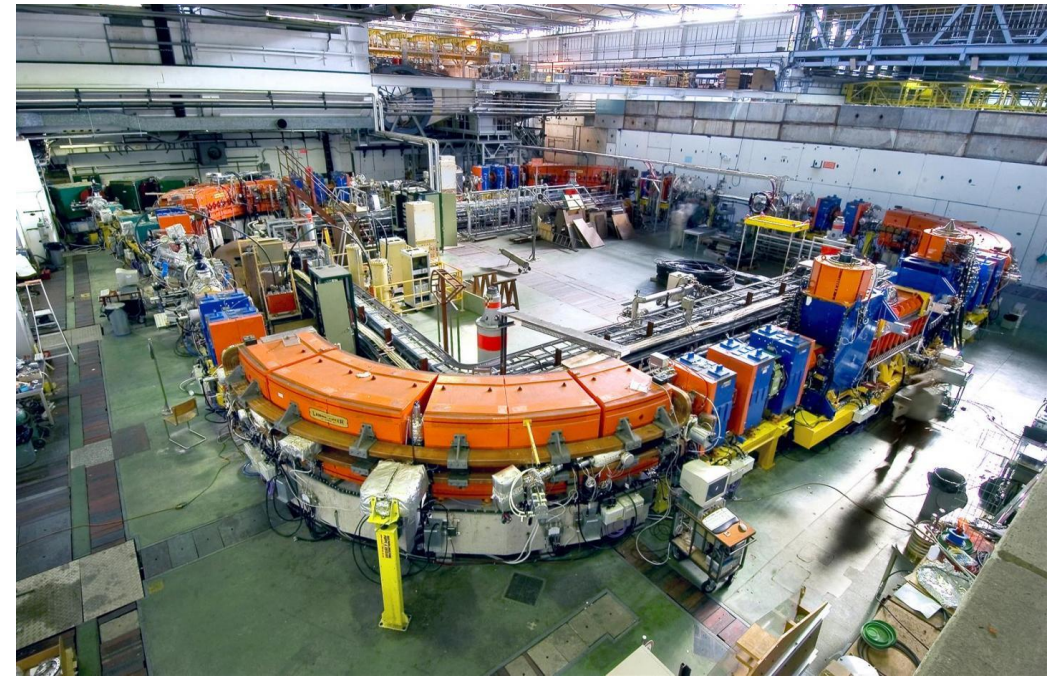
# Visits today – group 1

13:50 at BUS stop → wit Simone

LEIR : Low Energy Ion Ring

Today : Injector for PS/SPS/LHC ion program

LEAR: First atoms of antimatter produced at CERN in 1996



## AD and ELENA

nature

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NEWS | 27 September 2023

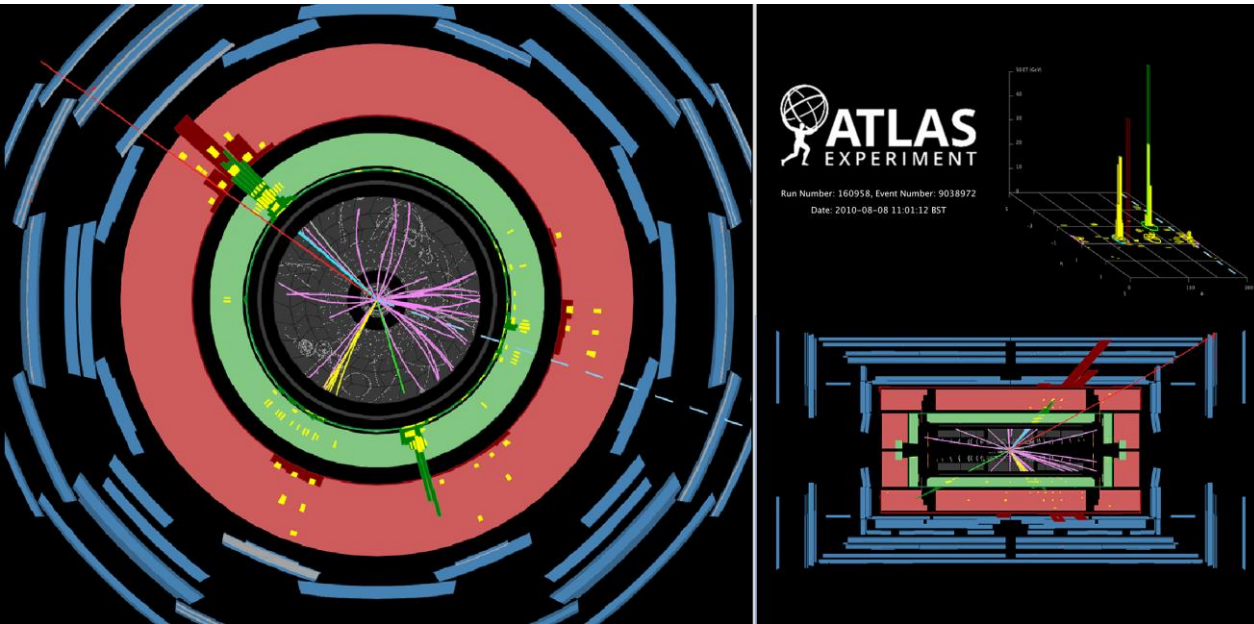
## Antimatter falls down, not up: CERN experiment confirms theory

Observing this simple phenomenon had eluded physicists for decades.

[Davide Castelvecchi](#)



# Visits today – group 2



## Synchrocyclotron:

CERN's first accelerator which was operated between 1957 and 1990  
ISOLDE operated there until 1980s

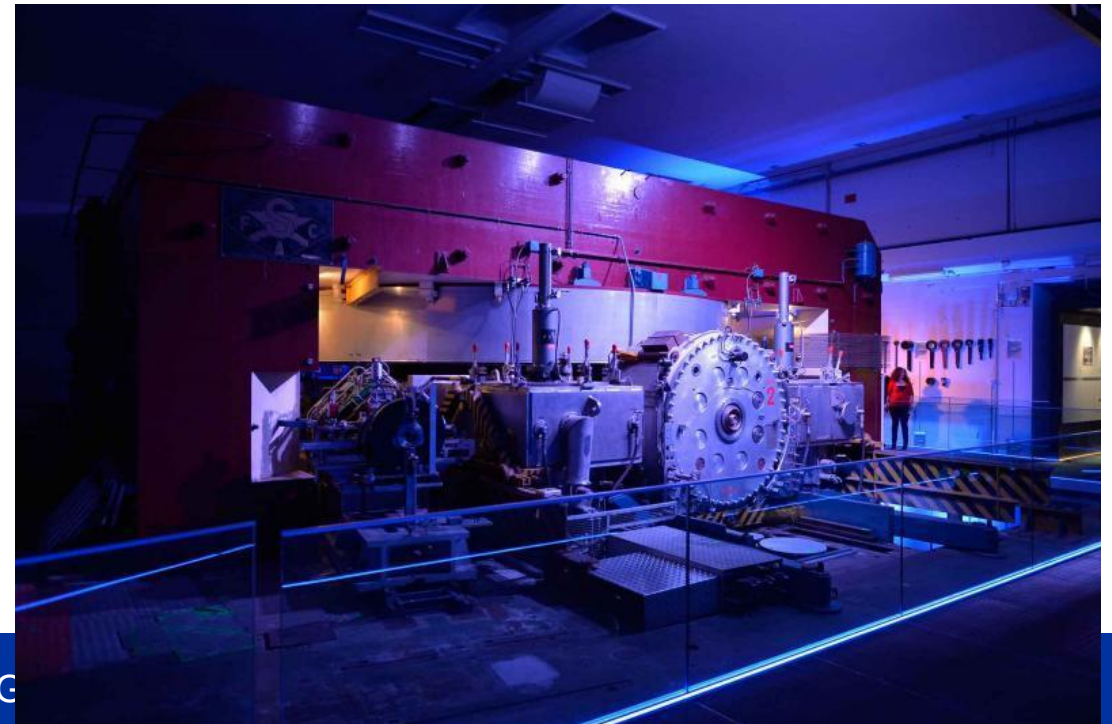
**13:50 at the place of the group photo → follow Elias**

## ATLAS :Push the frontiers of knowledge

ATLAS is a general-purpose particle physics experiment at the Large Hadron Collider (LHC) at CERN. It is designed to exploit the full discovery potential of the LHC, pushing the frontiers of scientific knowledge.

## Understanding the Universe

<https://atlas.cern/about>



# Last open practicalities for Proceedings

## Publishing, reminder of deadlines:

- **all speakers should upload the final version of their talk in JACoW (SPMS) by Sunday → Monday start working on the slides preparing them for the proceedings.**
- **31st October to announce the wish to contribute to the JINST proceedings → deadline for submitting paper → 31st December.**
- **Request from the IOC: upload also the posters on JACOW or make them available on INDICO**

MOA111	MOA412	TUA3C1	TUC1C2	TUC3I2	WEA2C1	WEA4C2	WEC2I2	THA1C1	THAFP03	THBP02	THBP13	THBP23	THBP35	THBP46	THBP57	THC2I3	FRC1I1
MOA1I2	MOA4I3	TUA3I1	TUC1I1	TUC3I3	WEA2C2	WEA4I1	WEC3C1	THA1I1	THAFP04	THBP03	THBP14	THBP24	THBP36	THBP47	THBP58	FRA1C1	FRC1I2
MOA1I3	TUA1C1	TUA3I2	TUC1I2	TUC4C1	WEA2I1	WEA4I2	WEC3C2	THA1I2	THAFP05	THBP04	THBP15	THBP26	THBP37	THBP48	THBP59	FRA1I1	FRC1I3
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MOA4I1	TUA2I2	TUC1C1	TUC3I1	WEA1I2	WEA4C1	WEC2I1	WEC4I2	THAFP02	THBP01	THBP12	THBP22	THBP34	THBP45	THBP55	THC2I2	FRA2I5	

Please check your email	Please check your email	Paper successfully processed	Assigned to an Editor	Ready for processing
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# Challenges and feedbacks

**Thank you to the Speakers → asked to present “Challenges and issues” and less “status reports”**

**From online feedbacks → what could be changed/improved, some thoughts/suggestions:**

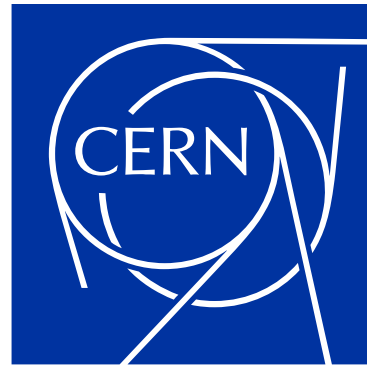
- Longer coffee time for offline discussions**
- More structured and longer discussion time at the end of the sessions focused on main topics of the day or preselected topics**
- One presentation less per day to increase further discussion time**
- Sustainability was included in many talks and the subject of many questions  
→ Topic for next time?**

# Nearly last acknowledgements

**Thank you very much to all of you for supporting the organization**

**Before leaving ...**

**Special thanks to Marta and Sylvia**



**Have a safe trip home**

**And let's meet again in China in 2025**

[home.cern](https://home.cern)