

Welcome to CERN

Italian Arts & Science Master Programme

September 1-5, 2024

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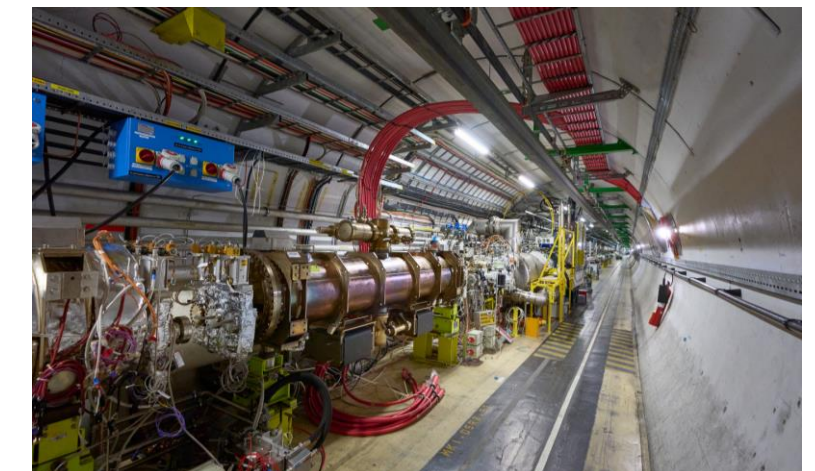
Conseil Européen pour la Recherche Nucléaire

Collaboration

Education

Fundamental Research

New Technologies



History



1952

Foundation of CERN under the auspices of UNESCO in Geneva

1953

Signing of the CERN charta

1954

Completion of the ratification process of the 12 Member States (incl. Italy)

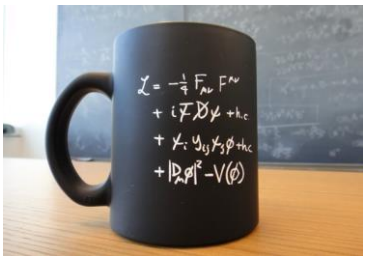
Nuclear Research?



European Laboratory for Particle Physics

European?

Budget (2023)
1,2 Mrd. CHF



Member States of CERN

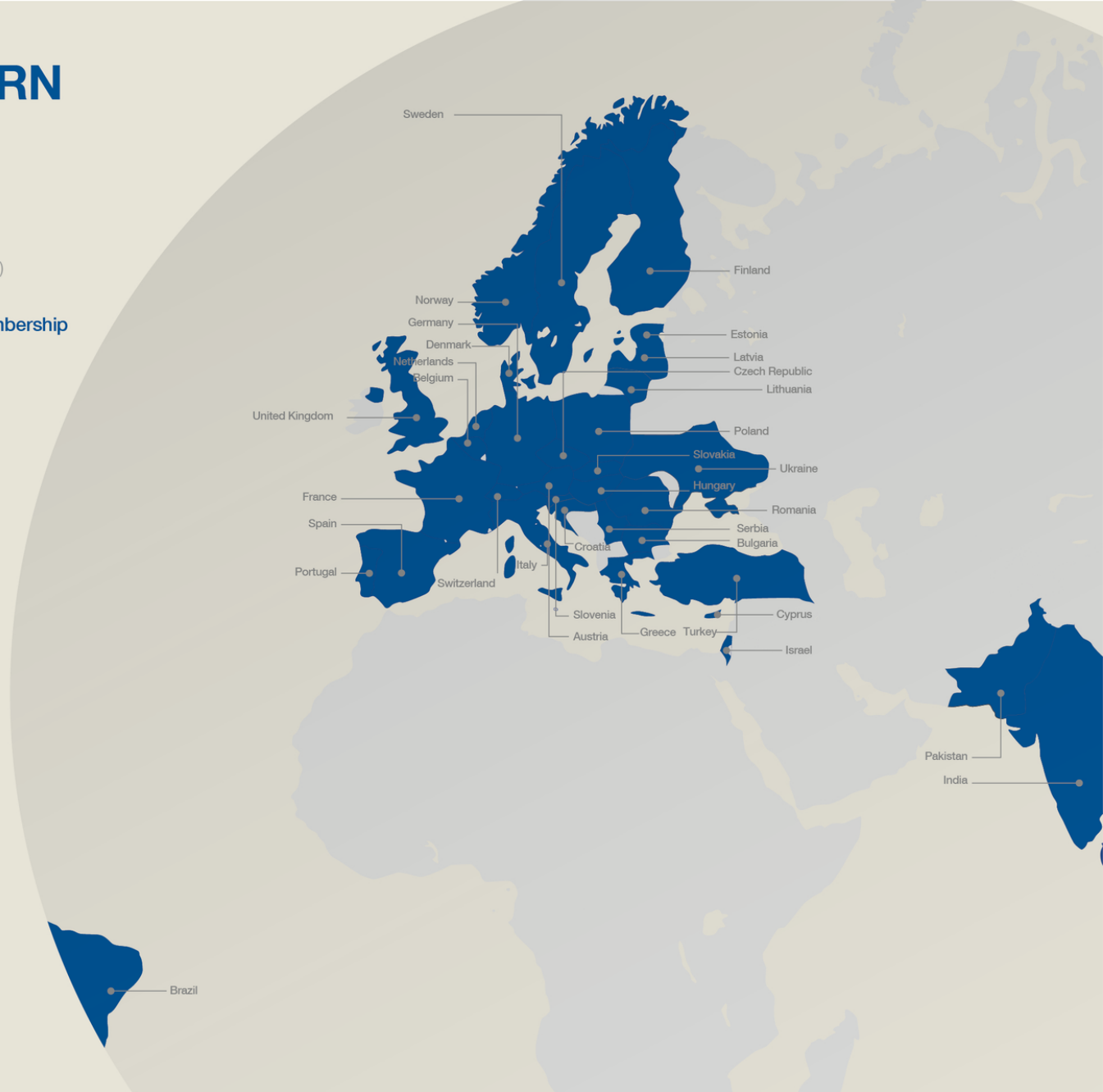
Member States (date of accession)

-  Austria (1959)
-  Belgium (1953)
-  Bulgaria (1999)
-  Czech Republic (1993)
-  Denmark (1953)
-  Finland (1991)
-  France (1953)
-  Germany (1953)
-  Greece (1953)
-  Hungary (1992)
-  Israel (2014)
-  Italy (1953)
-  Netherlands (1953)
-  Norway (1953)
-  Poland (1991)
-  Portugal (1986)
-  Romania (2016)
-  Serbia (2019)
-  Slovakia (1993)
-  Spain (1961-1968, 1983-)

-  Sweden (1953)
-  Switzerland (1953)
-  United Kingdom (1953)

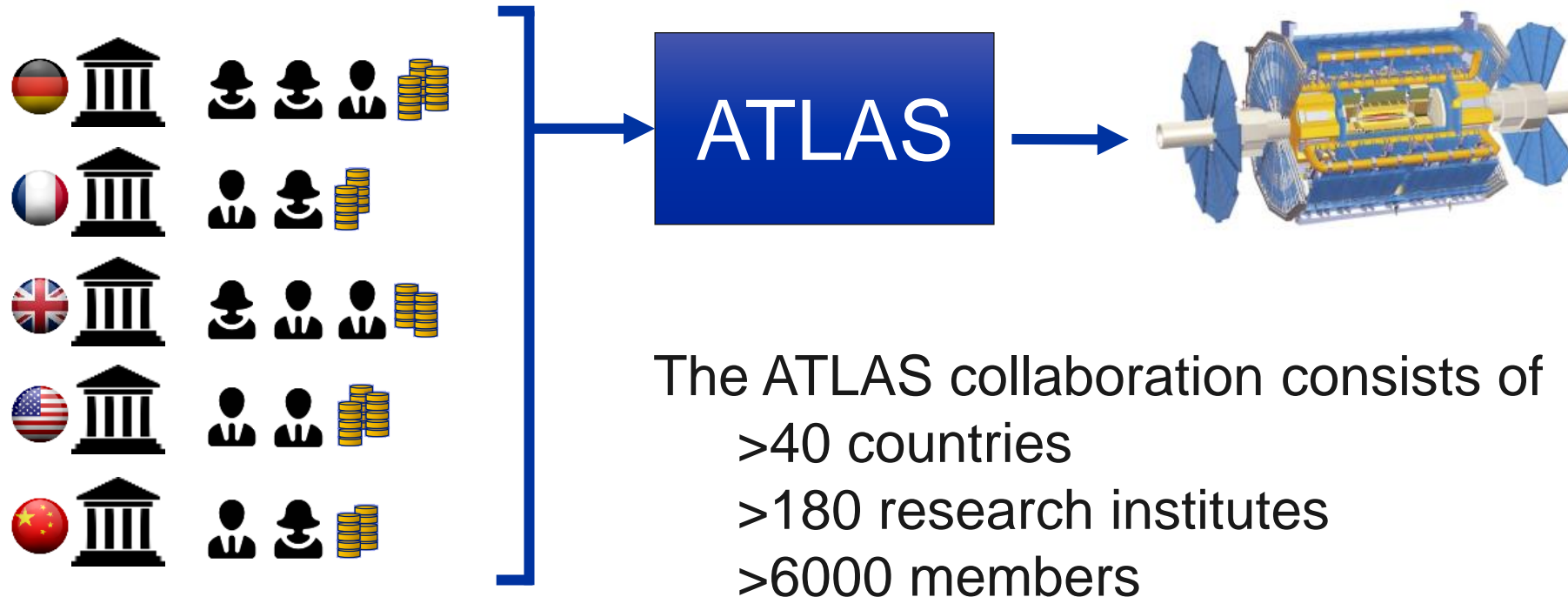
States in accession to Membership and Associate Members

-  Brazil (2024)
-  Croatia (2019)
-  Cyprus (2016)
-  Estonia (2021)
-  India (2017)
-  Latvia (2021)
-  Lithuania (2018)
-  Pakistan (2015)
-  Slovenia (2017)
-  Turkey (2015)
-  Ukraine (2016)



Worldwide Collaborations

For example: ATLAS



Who works at CERN?



2 600 Staff

800 Fellows (PostDocs)

550 Students

15 000 User

2 000 External companies

20 000 people with >110 different nationalities from institutes based in >70 different countries!

Fundamental questions of humankind



Where do we come from?

What are we made of?

Quarks

Higgs boson

Forces

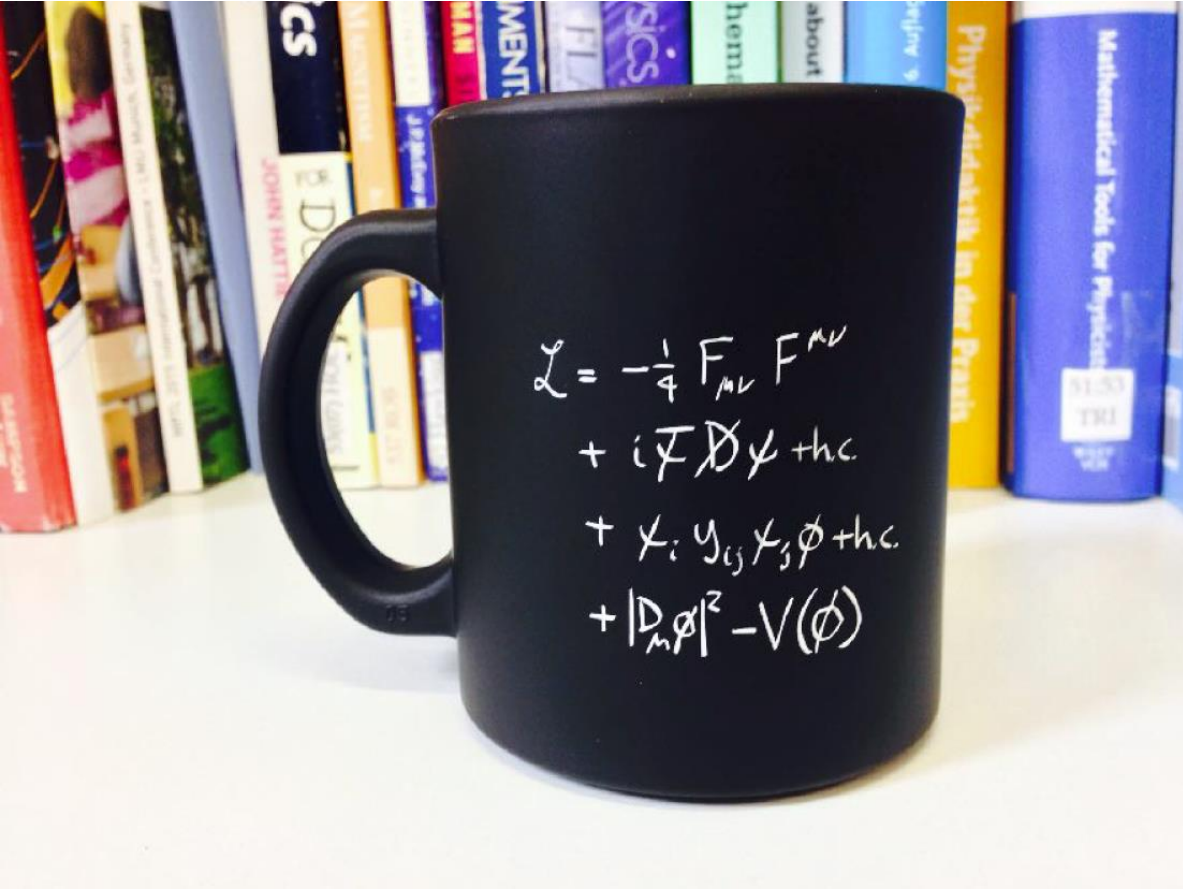
Leptons

CERN ACCELE



Where are we going?

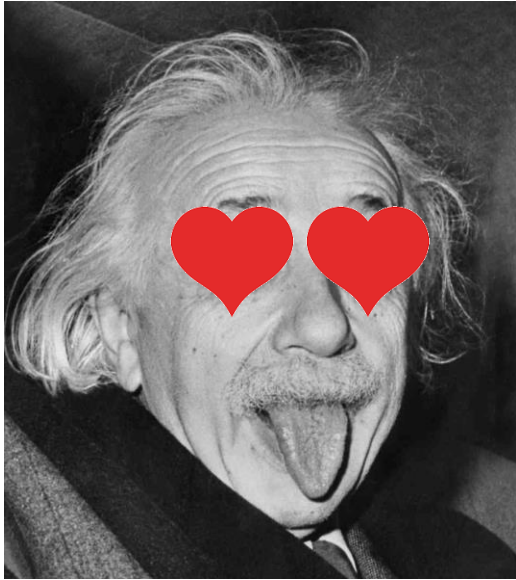
What are we made of?

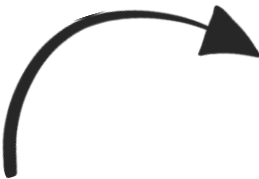


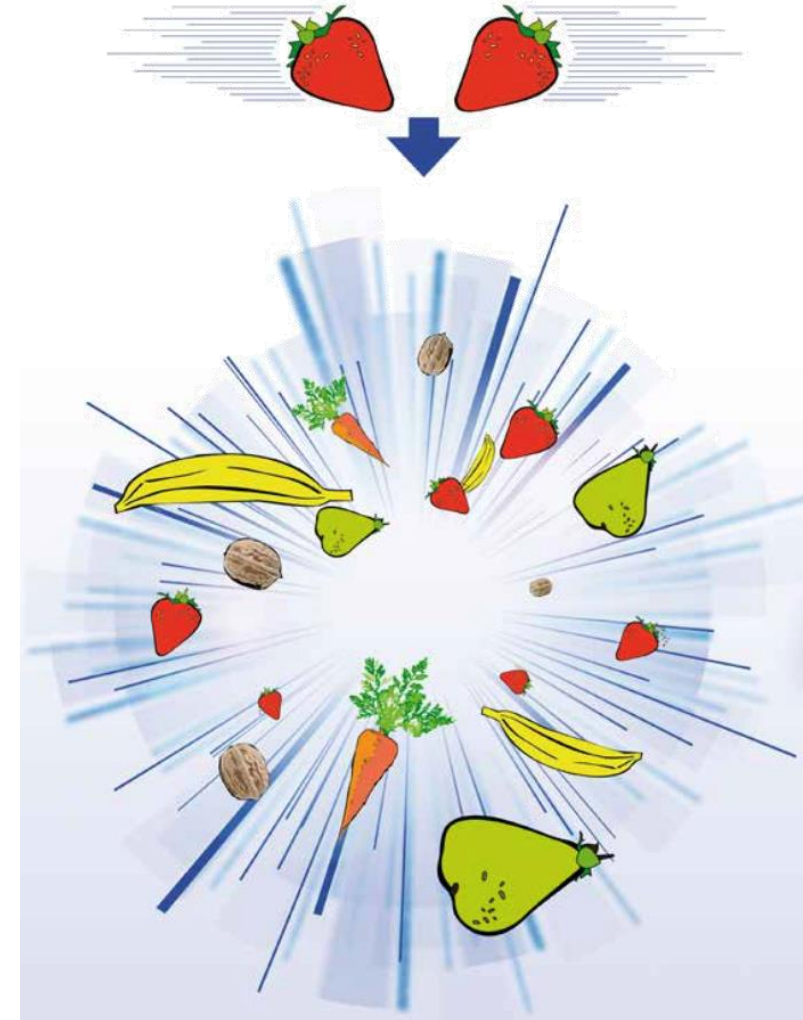
Acceleration and collision

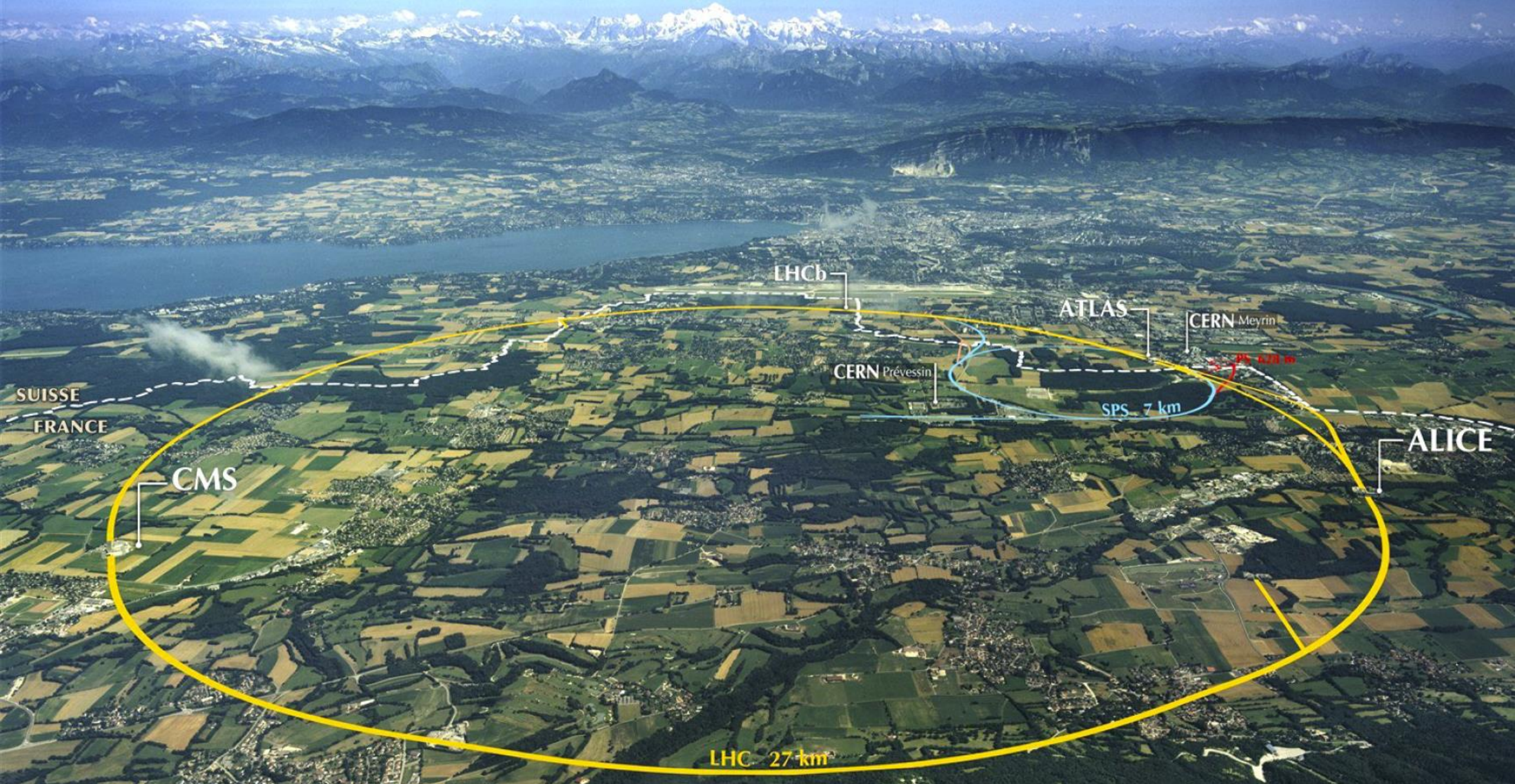


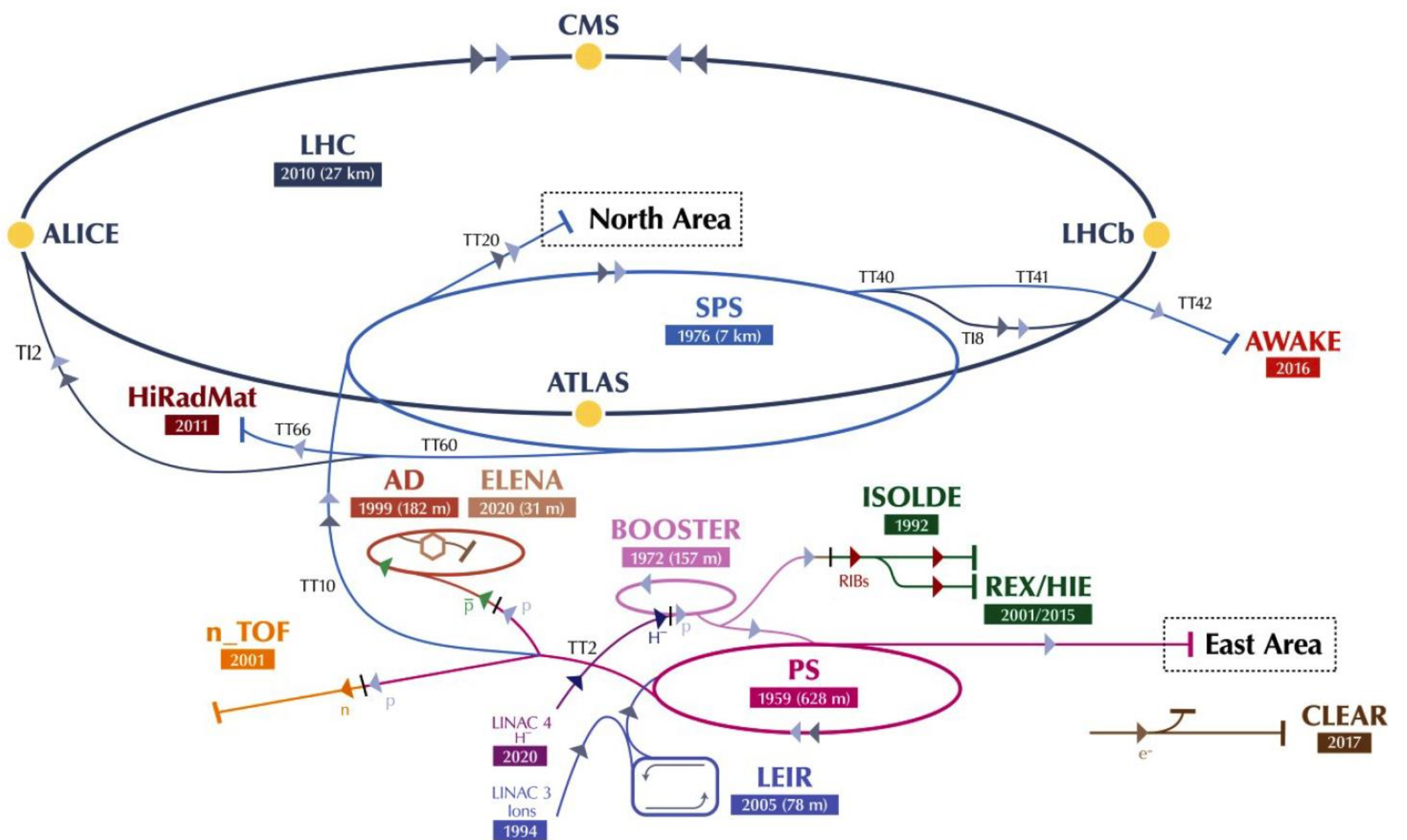
Acceleration and collision



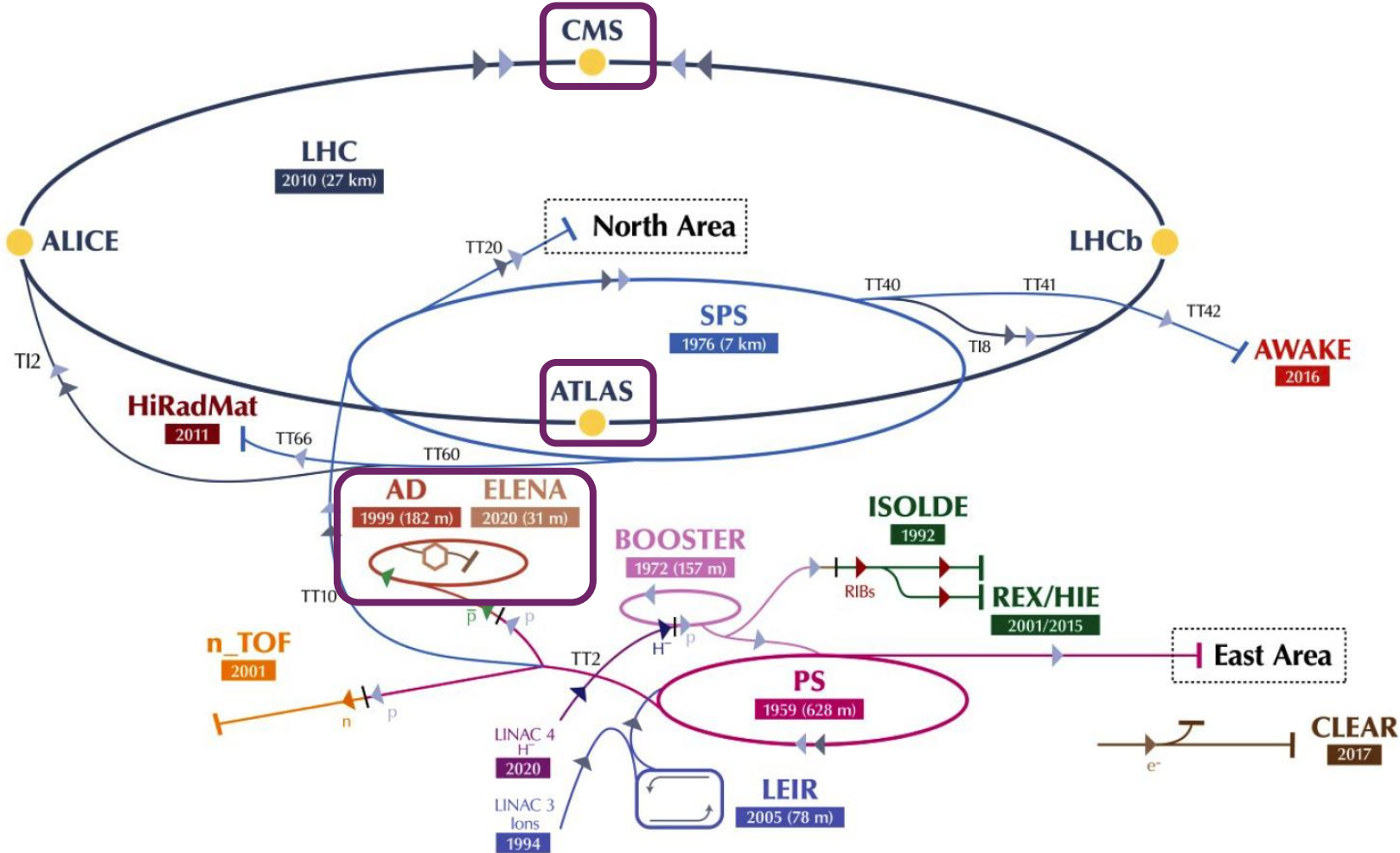

 $E=mc^2$







What will we visit this week?



CERN Science Gateway



Exhibitions



Guided tours



Science Shows



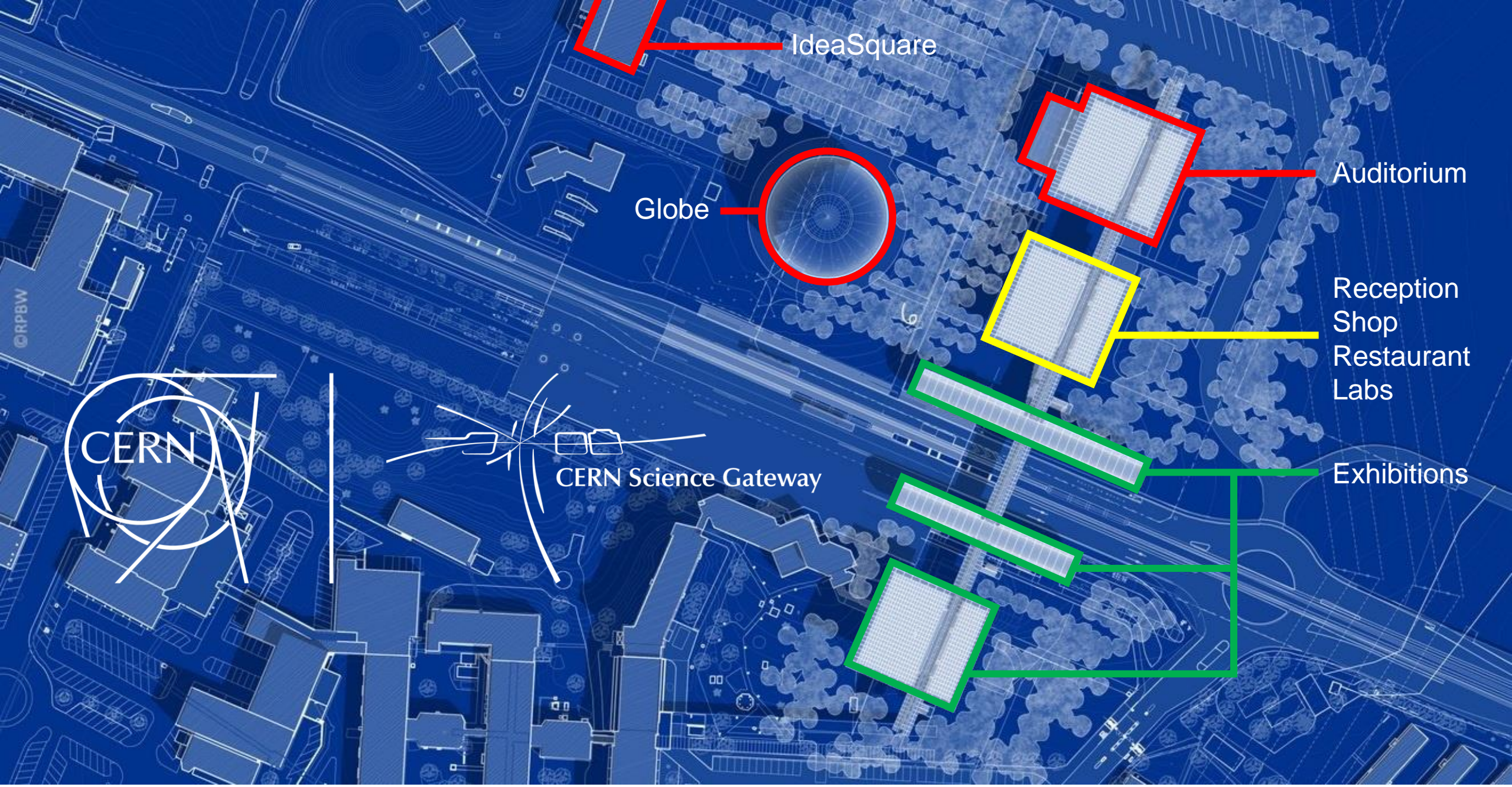
Lab Workshops



Learn Online



Events



IdeaSquare

Auditorium

Globe

Reception
Shop
Restaurant
Labs

Exhibitions

CERN Science Gateway

CERN



Knowledge Transfer

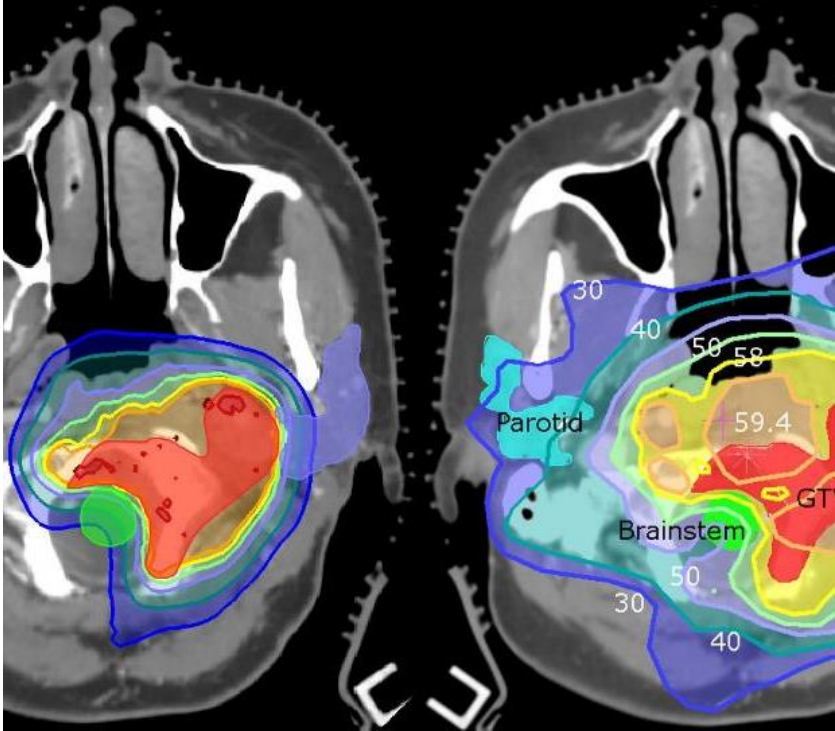


Google Search

I'm Feeling Lucky

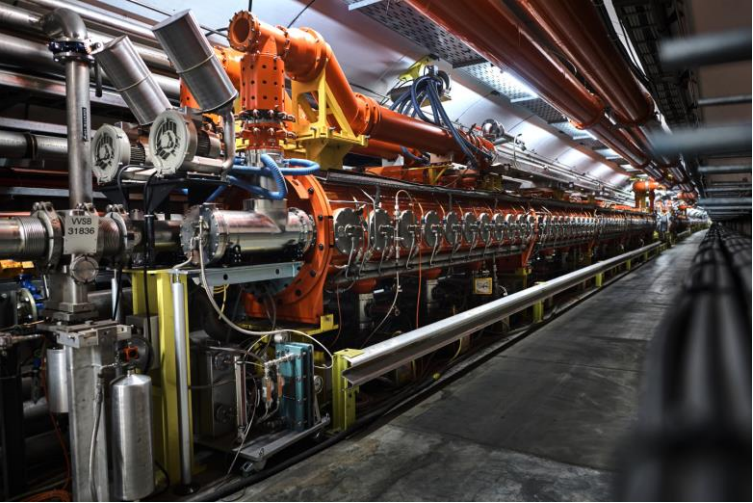
World Wide Web

Touchscreen

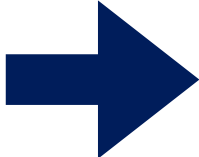


Medical applications

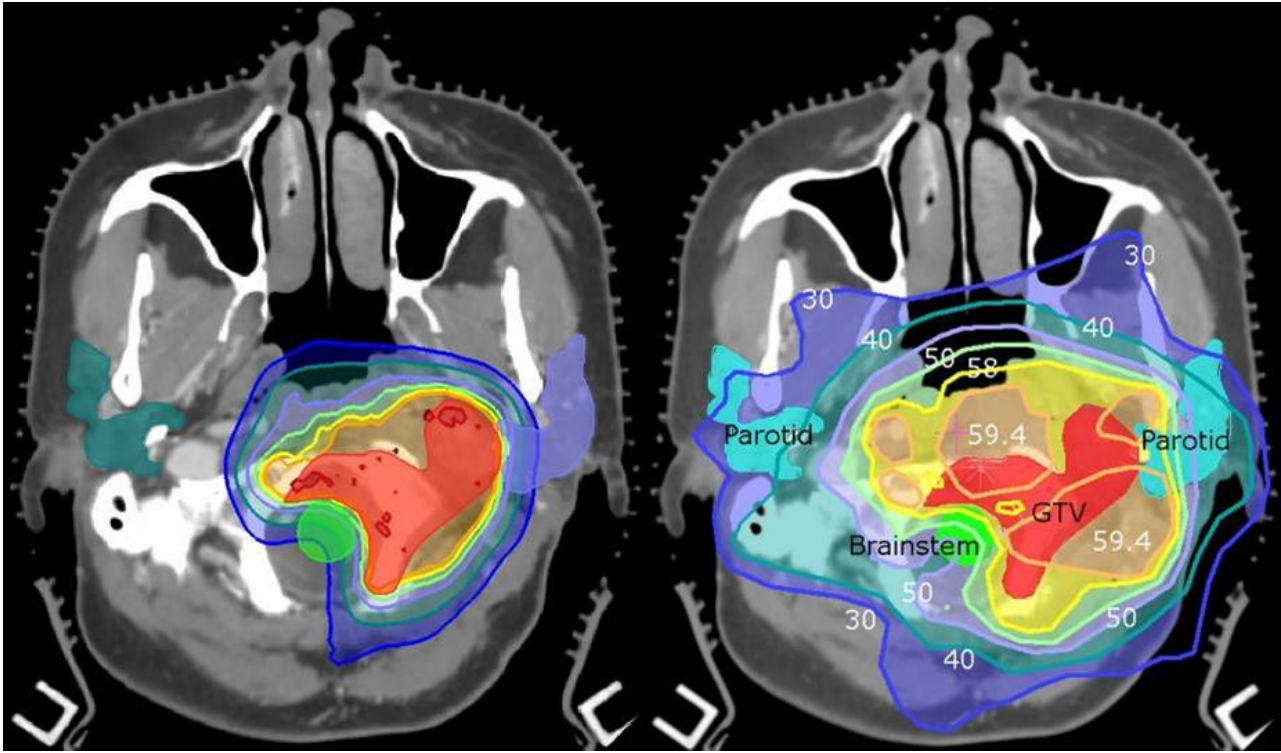
Medical Applications



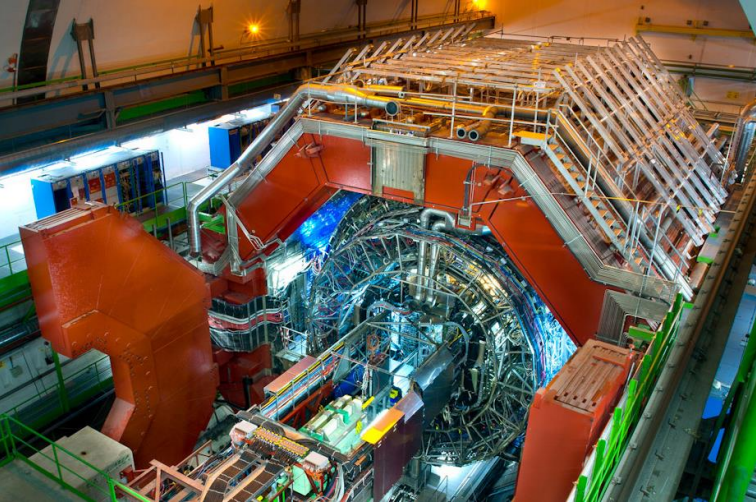
Particle accelerator



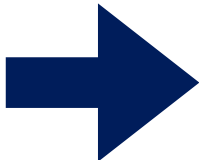
Hadron-Therapy
Treating cancer with hadrons



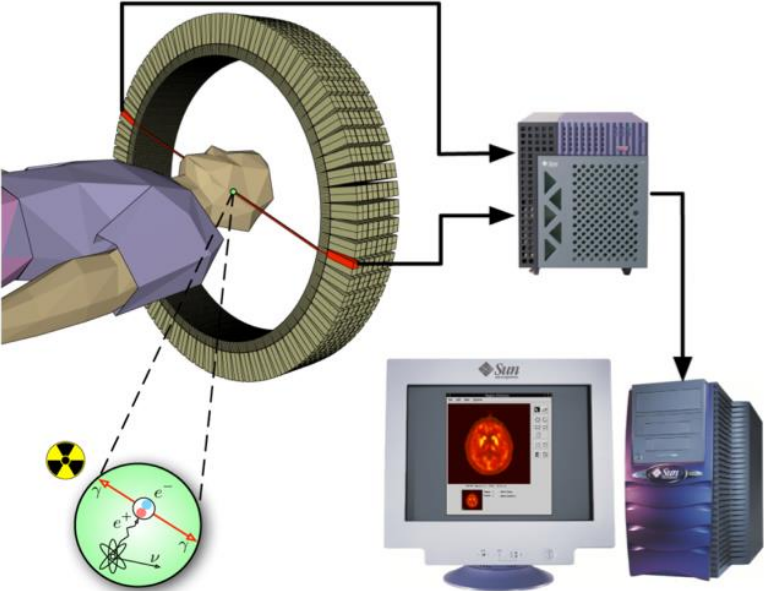
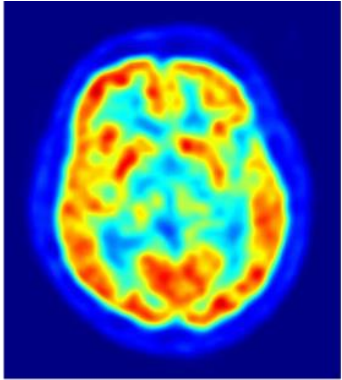
Medical applications



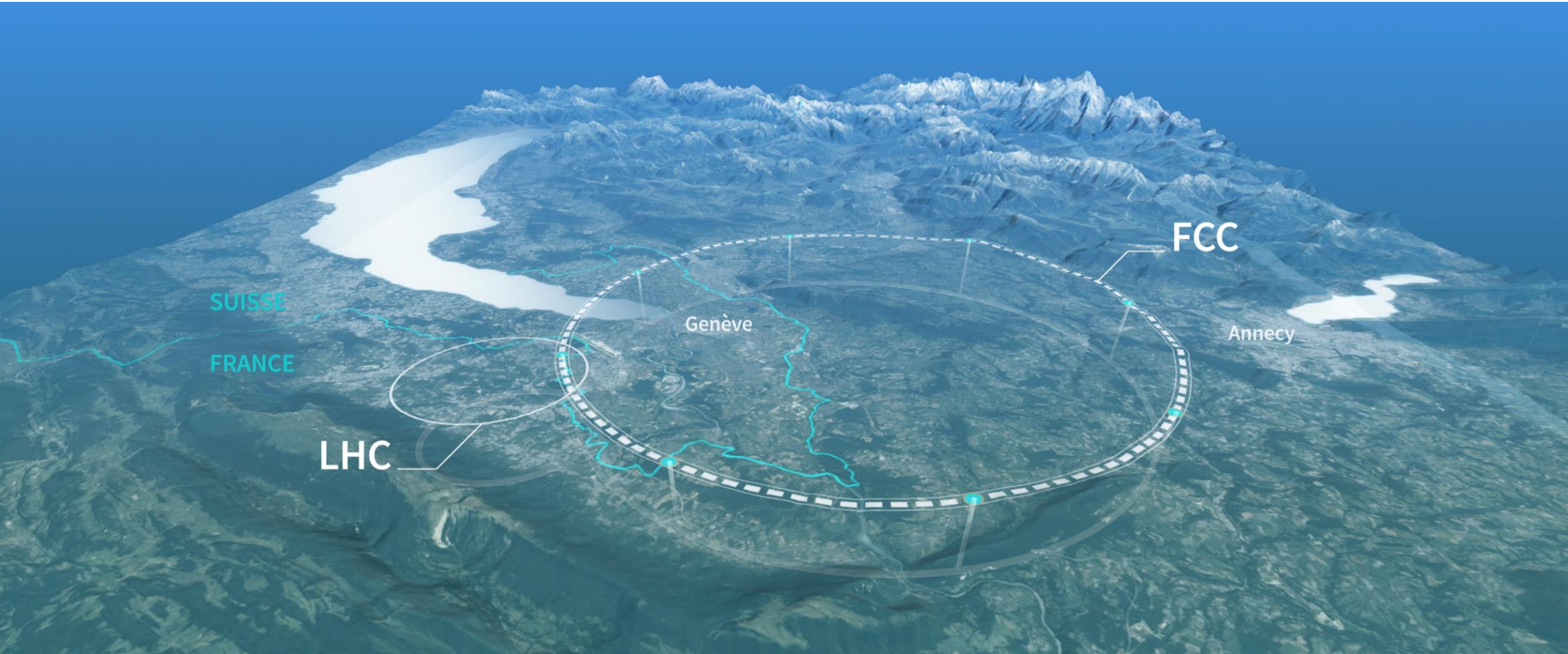
Particle detector



Imaging technologies
E.g. positron-emission-
tomography (PET)



A potential future circular collider



Beamline for Schools

You can be a scientist!

The **Beamline for Schools (BL4S)** competition invites teams of students from around the world to propose an experiment to be carried out at a particle accelerator.

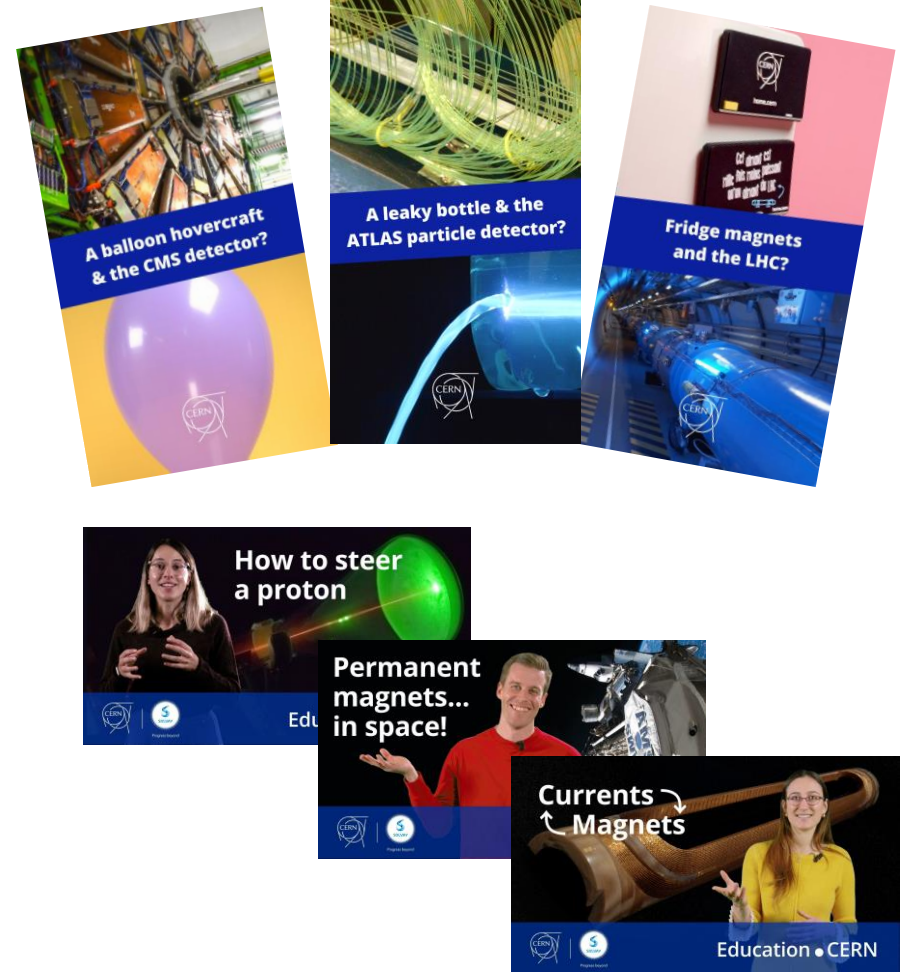
Two winning teams will be invited to CERN and one team to DESY to carry out their experiments. Further **prizes** (e.g. telescopes, cloud chambers, BL4S T-shirts) will be awarded to 60 selected teams.



Submission deadline
10 April 2025: <https://cern.ch/bl4s>

CERN-Solvay Student Programme

- 1. DIY-Videos:** Discover **experiments** that you can easily carry out at home or at school and that are related to the science or technology of CERN.
- 2. Online physics course:** Learn about **scientific topics** that CERN researchers and engineers deal with every day in interactive videos on the CERN Solvay Student Programme website.



cern.ch/solvay-education



youtube.com/CERN



solvay.education.programme@cern.ch

Educational Resources



Educational Resources

Here you will find a collection of educational resources developed in the framework of education and outreach activities at CERN.

Whether you're a student, a teacher, or simply someone with a curious mind, these resources are designed to spark your interest by bringing you closer to the physics and technology of CERN. You will also find material that can aid you in preparing for, enjoying, and following up on a visit to CERN, or engaging with it online if you cannot visit us physically.

So, whether you're looking to enhance your classroom experience, satisfy your curiosity about the universe, or you simply want to learn something new and exciting, these educational resources will guide you on your educational adventure.



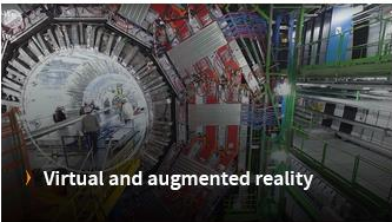
Hands-on



Reading material



Videos & animations



Virtual and augmented reality



<https://educational-resources.web.cern.ch/>

Thank you!
Questions?



education.cern

References

Image by vwalakte on Freepik https://www.freepik.com/free-photo/intergalactic-travel-concept-ai-generated_133558234.htm#query=big%20bang&position=19&from_view=keyword&track=ais&uuid=91dc2bb5-c945-406d-beb2-46066a045526

Image by rawpixel.com on Freepik https://www.freepik.com/free-photo/outer-space-background_4100956.htm#query=galaxies&position=16&from_view=search&track=sph&uuid=1f3b6edc-58fc-4c88-9f4d-8ca46df34fce