



ISPCS
CERN 2018
September 30 - October 5

European Organization for Nuclear Research



Mont Blanc

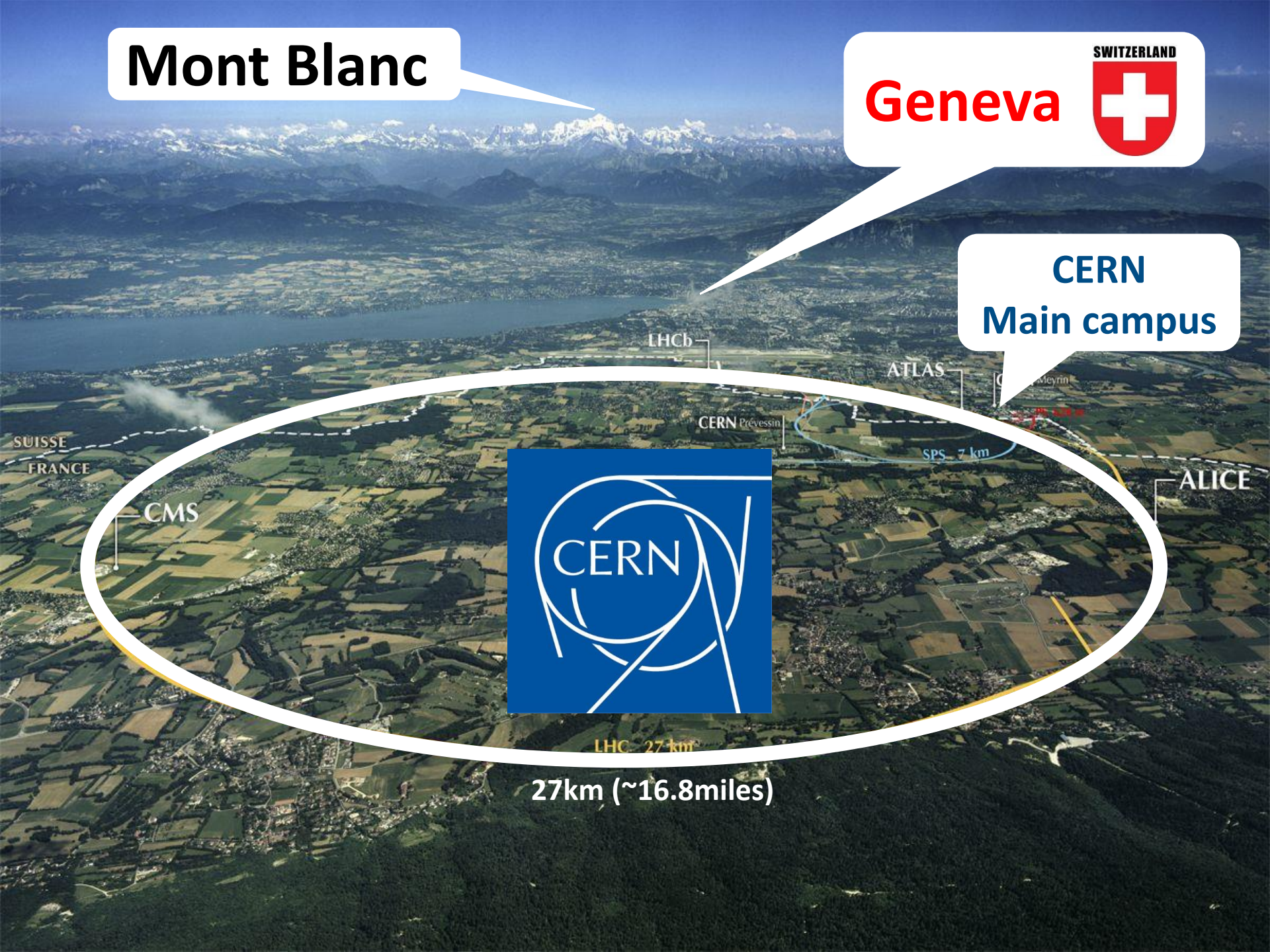
Geneva



CERN
Main campus



LHC 27 km
27km (~16.8miles)



Mont Blanc

Geneva



CERN
Main campus

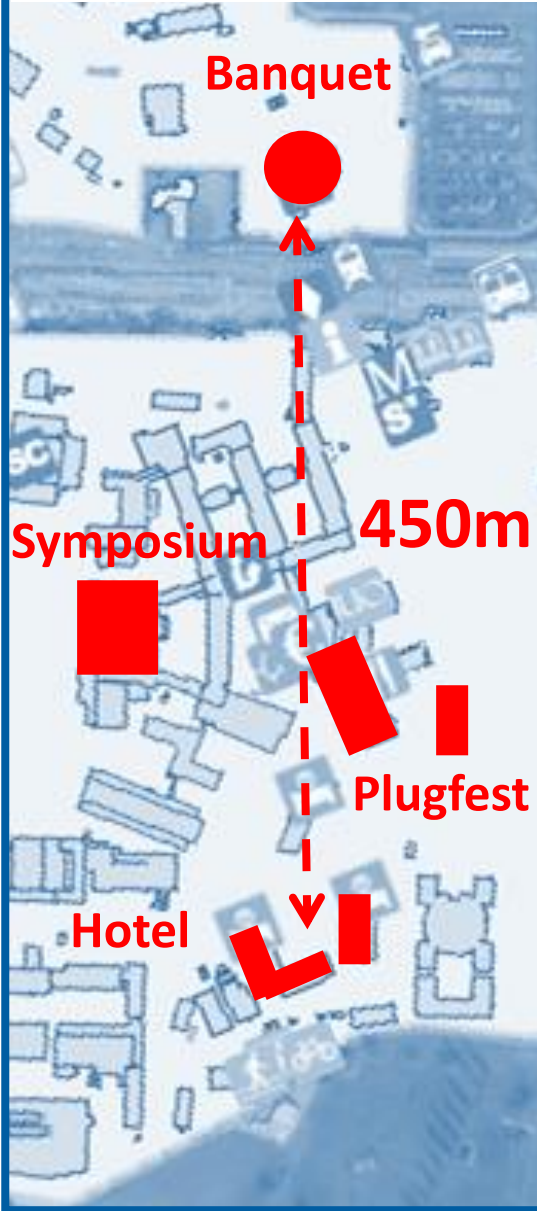
LHCb

ATLAS

CERN Prévessin



20min
to/from
Geneva
City/Airport



Hosted at CERN campus

- Hotel & events within walking distance
- 20min by tram from/to Geneva center
- 20min by bus from/to Geneva airport



Symposium

in the CERN Main Auditorium



Symposium



The place where CERN discoveries are announced

Plugfest

in a tent in front of CERN Restaurant



A tent built especially for the
Plugfest

Banquet dinner

in the **Globe of Science and Innovation**

Banquet



CERN's landmark that hosts exhibitions and special events such as TEDxCERN



Accommodation

in CERN Hotel



The Hotel serves scientists and engineers visiting CERN for short stays



CERN Control Center



Antimatter Factory



Visit to CERN facilities on Friday afternoon



CERN data center



Magnet test facility

CERN IT Department

The PC farm Computing Power

The Grid challenge
The computing power needed for analysis of LHC data is equivalent to 100,000 processors in 2004. CERN will have 7000 PCs by 2008, each PC containing two or more processors. The rest of the necessary computing power will be provided by >100 institutions involved in the LHC Computing Grid.

Le défi de la Grille
En 2004, la puissance de calcul nécessaire pour l'analyse des données du LHC équivaut à 100 000 processeurs. En 2008, le CERN disposera de 7000 PC, chacun avec deux ou plus processeurs. Le reste de la puissance requise sera fourni par plus de 100 participants à la Grille de calcul du LHC.

Equipment
By April 2006, about 3500 PCs were installed in the computer centre, with a demand of up to 1 MW of power. A substantial fraction of this power is being turned into heat, requiring substantial air conditioning.

Logiciels
Pour les besoins de la Grille, il est nécessaire de développer de nombreux logiciels.

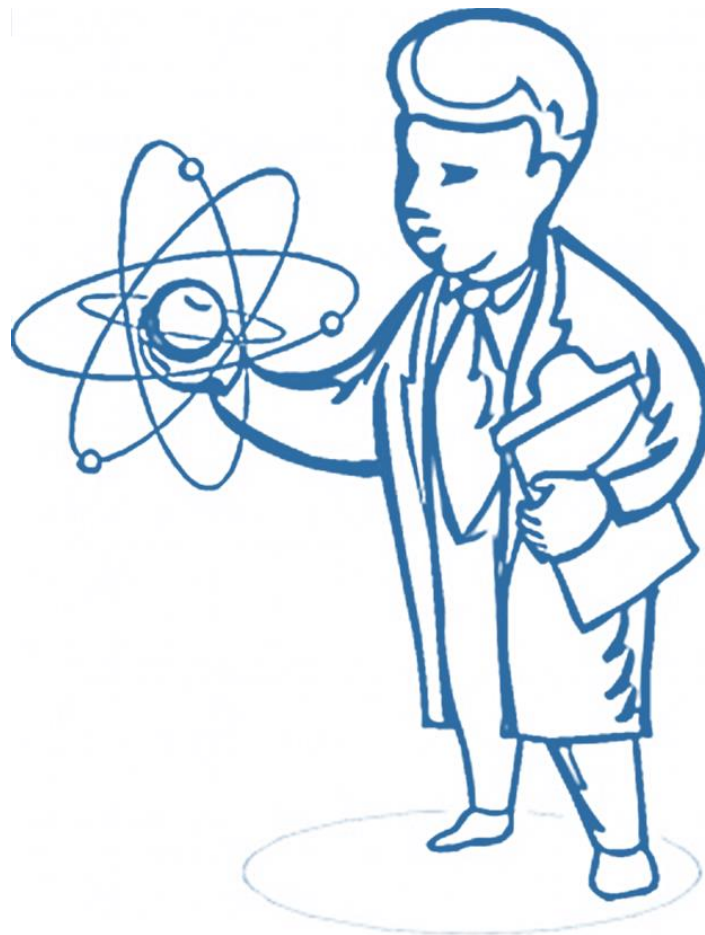
Software
For the Grid environment, a substantial fraction of the power is being turned into heat, requiring substantial air conditioning.

Diagram: A flowchart showing the data flow from the LHC to the CERN Computer Center, then to the PC Farm, and finally to the LHC Computing Grid. It also shows the connection to the LHC Detectors.



Particle physics laboratory

Study
the fundamental
laws of nature and
constituents of
matter

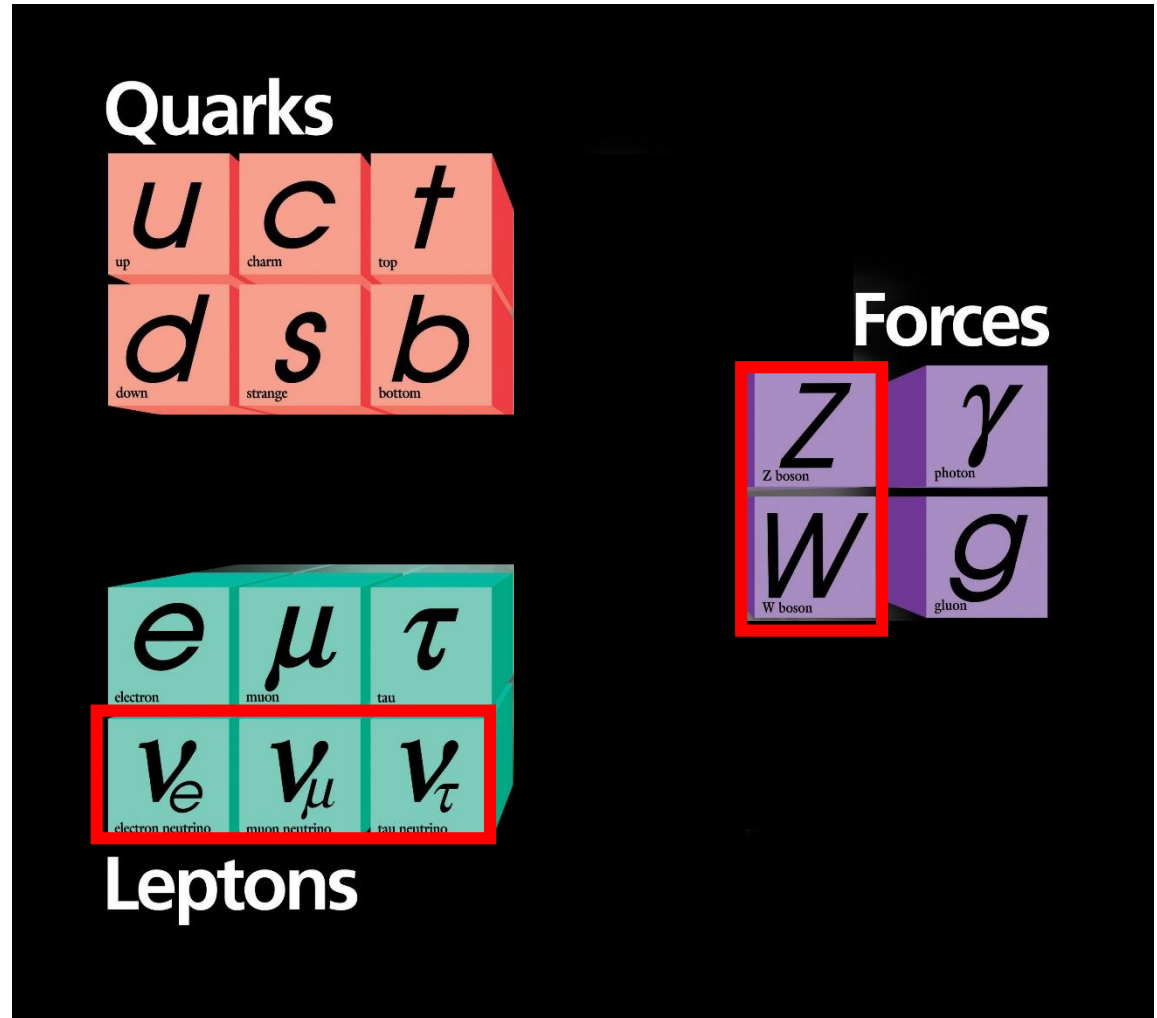




Particle physics laboratory



- Standard model

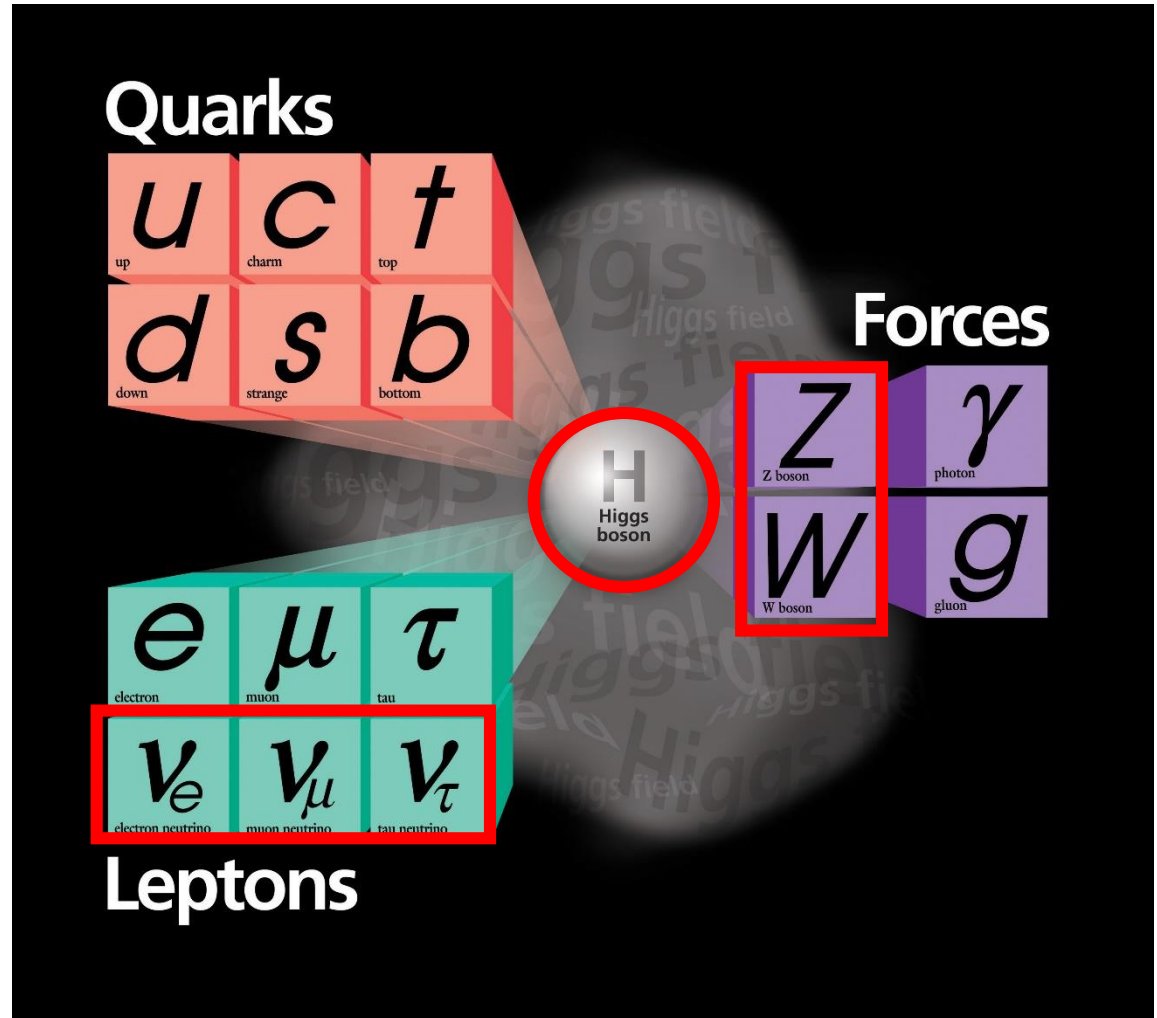




Particle physics laboratory



- Standard model
- Higgs Boson



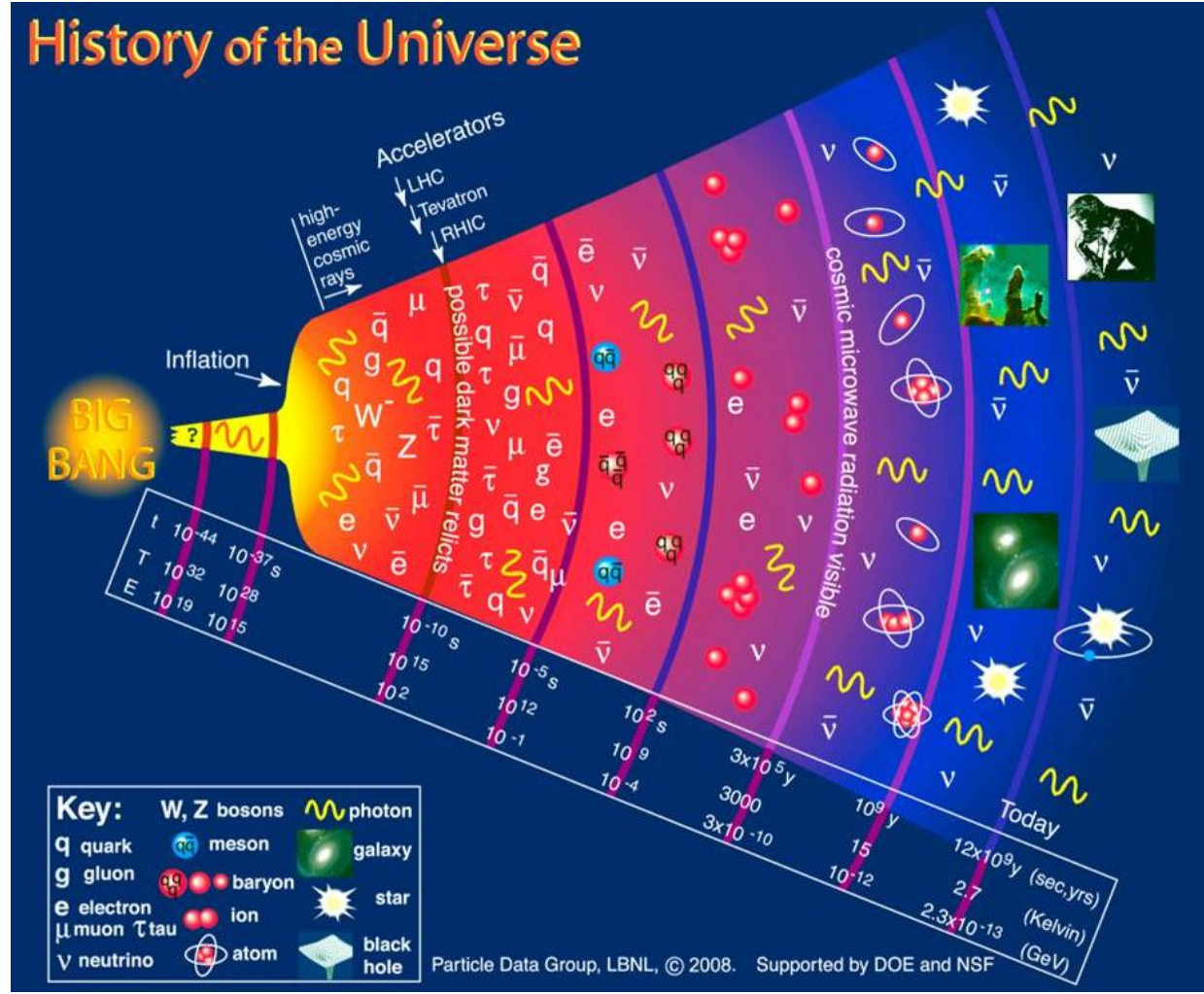


Particle physics laboratory



- Standard model
- Higgs Boson
- **Early Universe**

History of the Universe

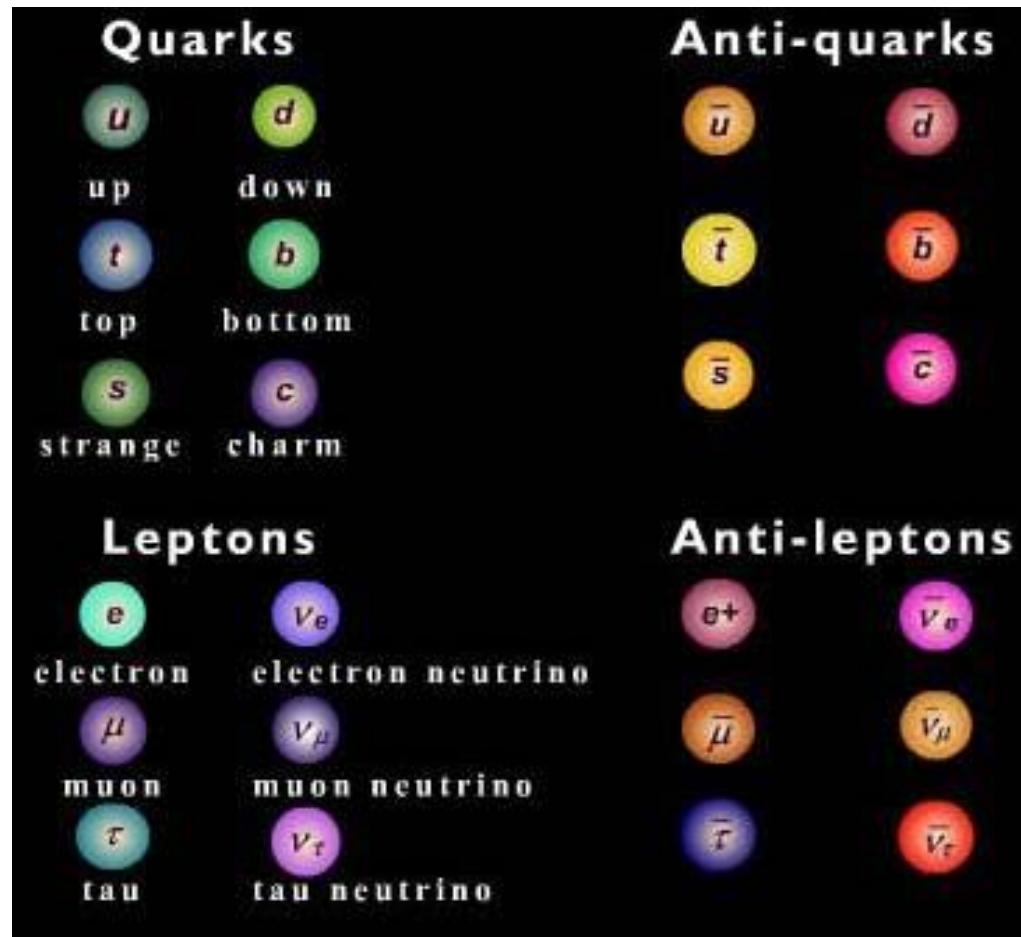




Particle physics laboratory



- Standard model
- Higgs Boson
- Early Universe
- **Antimatter**





Particle physics laboratory



- Standard model
- Higgs Boson
- Early Universe
- Antimatter
- **And many more...**

A screenshot of a web browser showing the CERN Physics page. The browser title is "Physics | CERN - Mozilla Firefox" and the address bar shows "home.cern/about/physics". The page header includes "CERN Accelerating science", "Sign in", "Directory", and language options for "English" and "Français". A navigation menu contains "Accelerators", "Experiments", "Physics", "Computing", "Engineering", "Updates", and "Opinion". The main content area has a "Physics" heading and a paragraph: "The research programme at CERN covers topics from kaons to cosmic rays, and from the Standard Model to supersymmetry". Below this is a link to "CERN Document Server" and another paragraph: "CERN's main focus is particle physics – the study of the fundamental constituents of matter – but the physics programme at the laboratory is much broader, ranging from nuclear to high-energy physics, from studies of antimatter to the possible effects of cosmic rays on clouds." On the right side, there is a dark sidebar with the heading "PHYSICS" and a list of topics: "Dark matter", "The early universe", "The search for antimatter", "The search for the Higgs boson", and "The Standard Model".

www.home.cern/about/physics



Particle physics laboratory



- Standard model
- Higgs Boson
- Early Universe
- Antimatter
- And many more...

How do we study?



Experimental research

Using world's
largest and most
complex tools

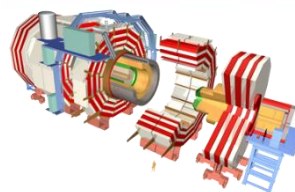
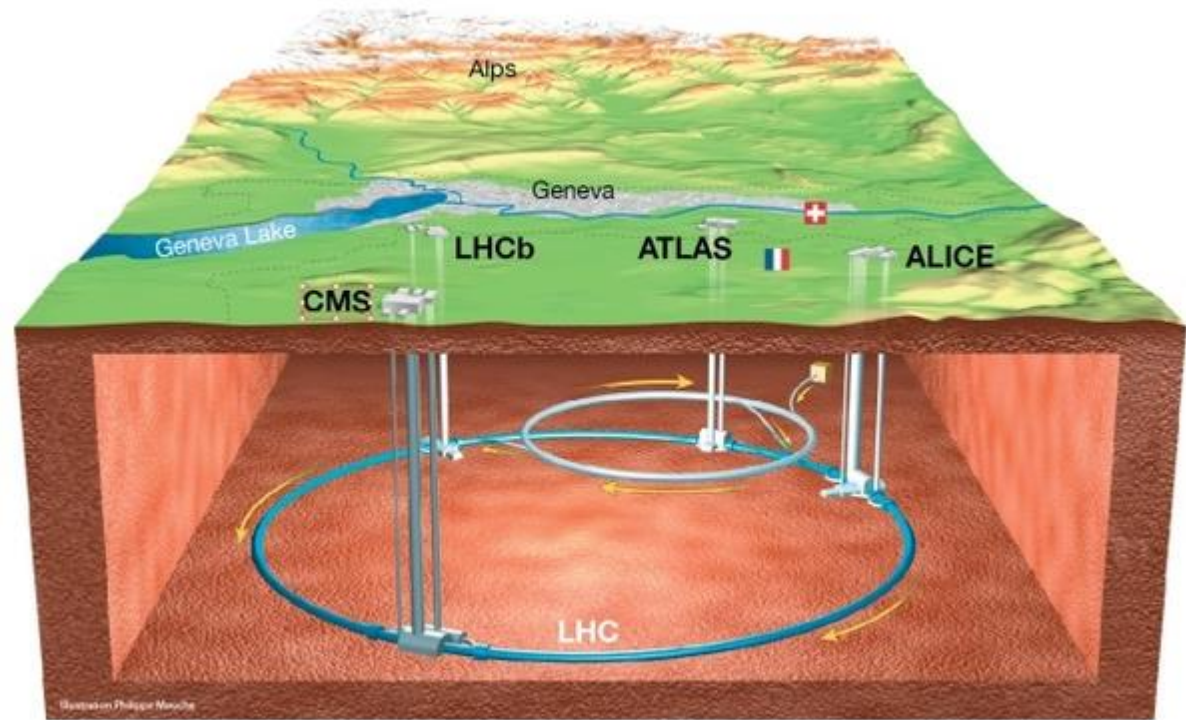




Experimental research



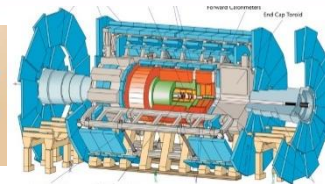
- Accelerators and detectors



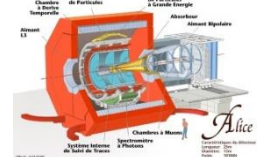
CMS



LHCb



ATLAS



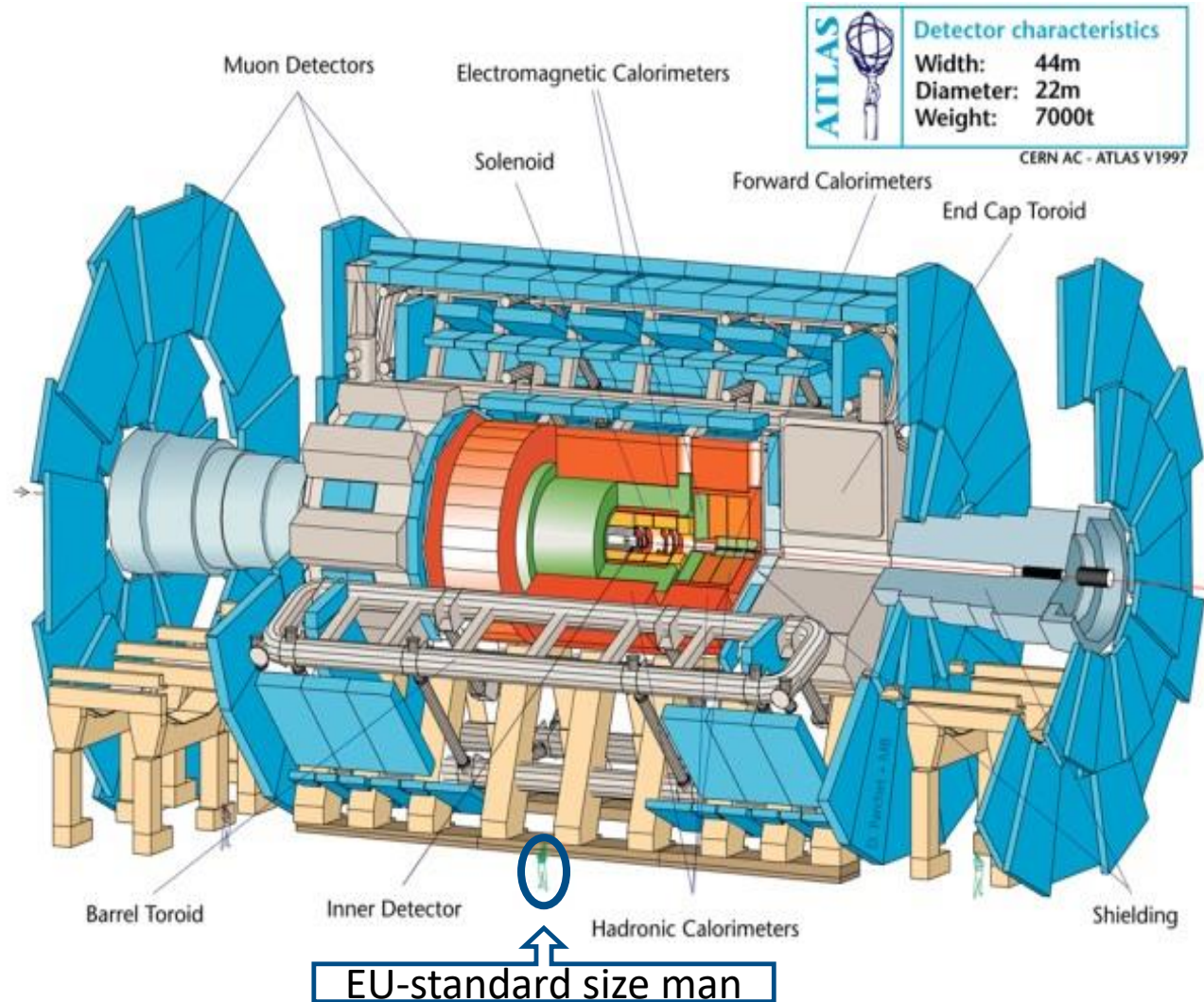
ALICE



Experimental research



- Accelerators and detectors

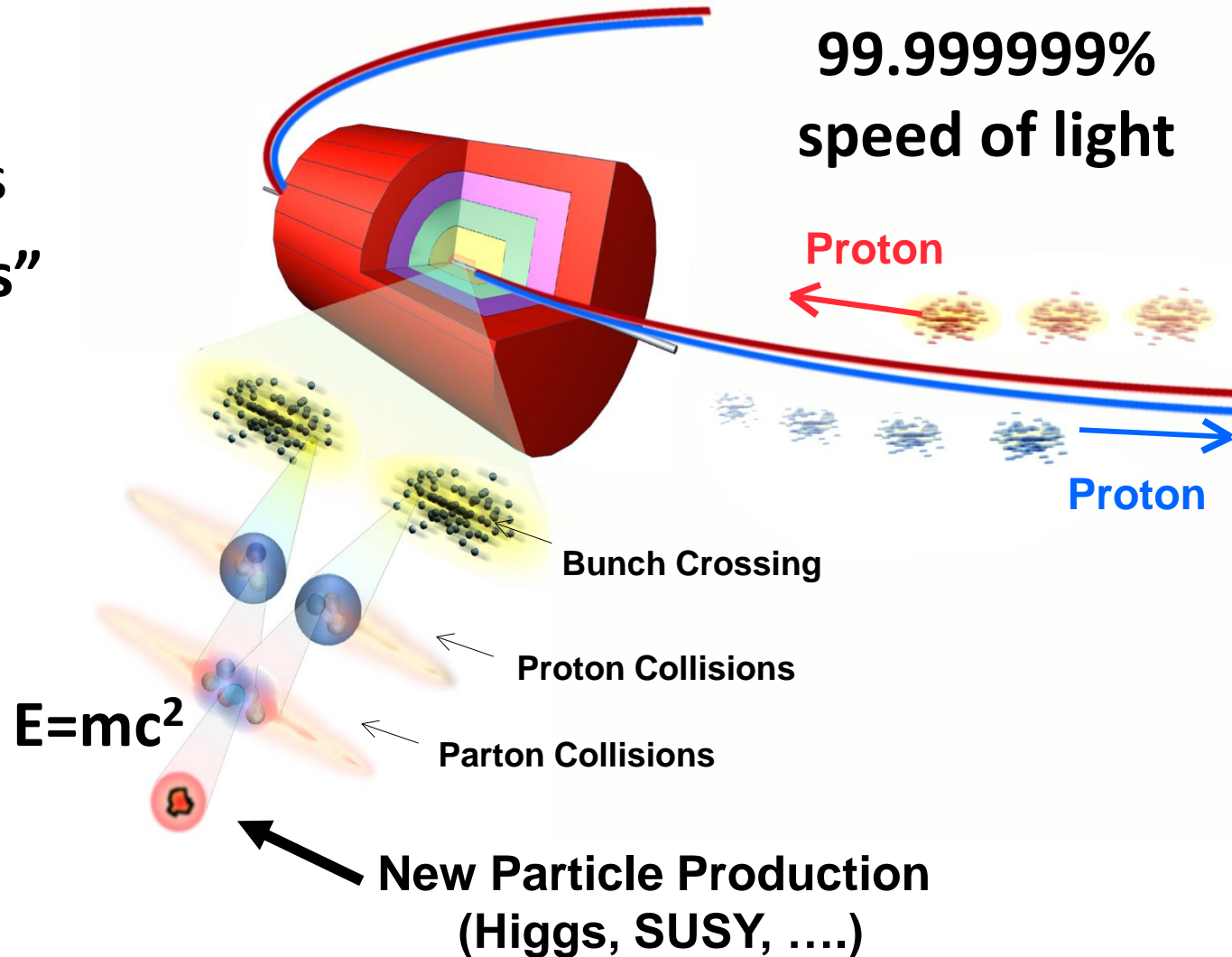




Experimental research



- Accelerators and detectors
- “Photographs” of collisions

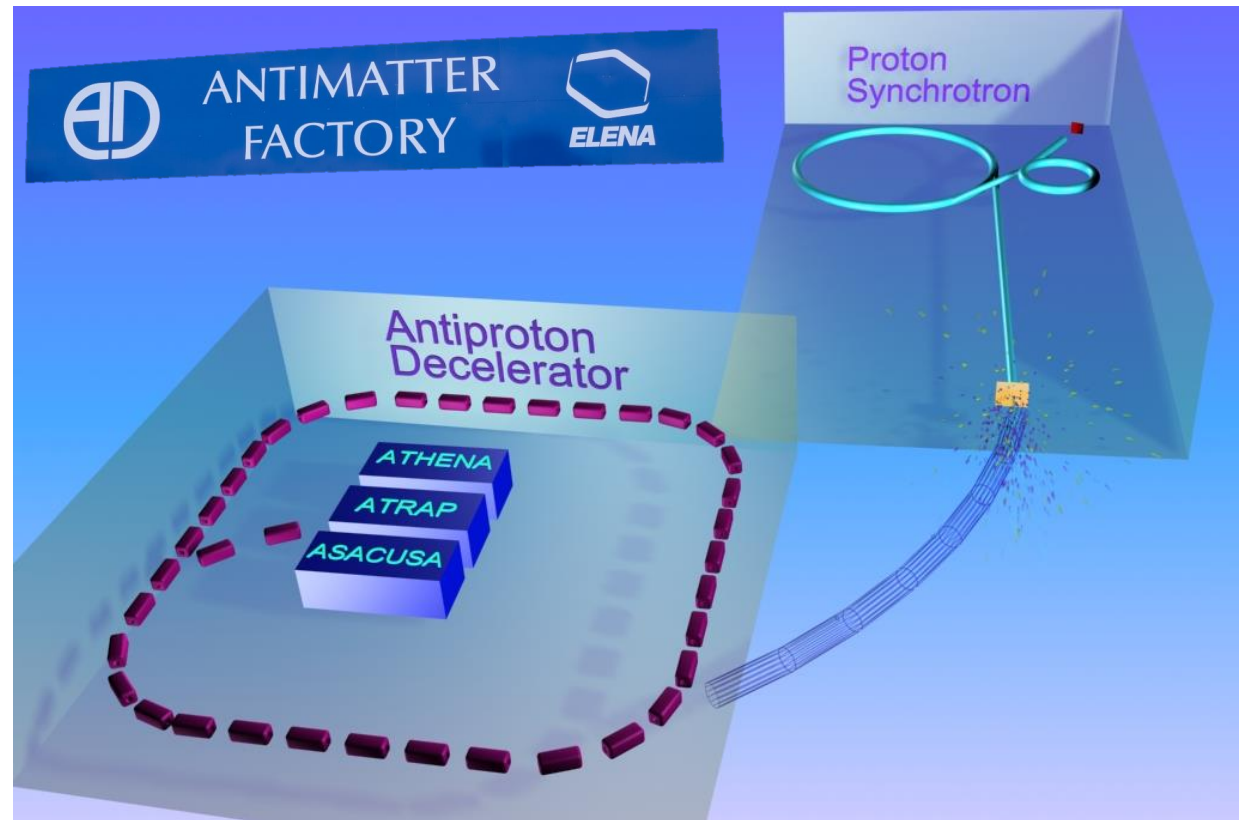




Experimental research



- Accelerators and detectors
- “Photographs” of collisions
- **Anti-hydrogen production**

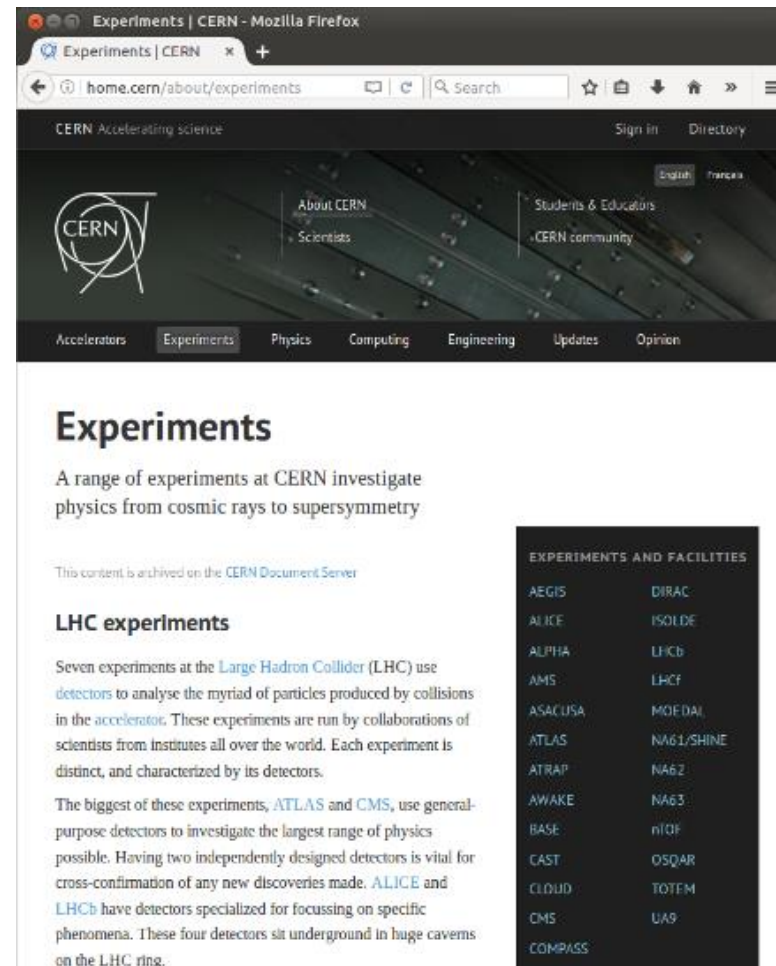




Experimental research



- Accelerators and detectors
- “Photographs” of collisions
- Anti-hydrogen production
- **And many more...**

A screenshot of the CERN Experiments page in a Mozilla Firefox browser. The page title is "Experiments | CERN". The URL is "home.cern/about/experiments". The page features a dark header with the CERN logo, navigation links for "About CERN", "Scientists", "Students & Educators", and "CERN community". Below the header is a main section titled "Experiments" with a sub-heading "A range of experiments at CERN investigate physics from cosmic rays to supersymmetry". A note indicates the content is archived on the CERN Document Server. The main text describes LHC experiments, mentioning ATLAS and CMS. On the right side, there is a table titled "EXPERIMENTS AND FACILITIES" listing various experiments and their corresponding facilities.

Experiments | CERN - Mozilla Firefox

Experiments | CERN

home.cern/about/experiments

CERN Accelerating science

Sign in Directory

English français

About CERN

Scientists

Students & Educators

CERN community

Accelerators Experiments Physics Computing Engineering Updates Opinion

Experiments

A range of experiments at CERN investigate physics from cosmic rays to supersymmetry

This content is archived on the [CERN Document Server](#)

LHC experiments

Seven experiments at the [Large Hadron Collider \(LHC\)](#) use [detectors](#) to analyse the myriad of particles produced by collisions in the [accelerator](#). These experiments are run by collaborations of scientists from institutes all over the world. Each experiment is distinct, and characterized by its detectors.

The biggest of these experiments, [ATLAS](#) and [CMS](#), use general-purpose detectors to investigate the largest range of physics possible. Having two independently designed detectors is vital for cross-confirmation of any new discoveries made. [ALICE](#) and [LHCb](#) have detectors specialized for focussing on specific phenomena. These four detectors sit underground in huge caverns on the LHC ring.

EXPERIMENTS AND FACILITIES	
AEGIS	DIRAC
ALICE	ISOLDE
ALPHA	LHCb
AMS	LHCf
ASACUSA	MOEDAL
ATLAS	NA61/SHINE
ATRAP	NA62
AWAKE	NA63
BASE	nIQE
CAST	OSQAR
CLOUD	TOTEM
CMS	UA9
COMPASS	

www.home.cern/about/experiments



Experimental research



- Accelerators and detectors
- “Photographs” of collisions
- Anti-hydrogen production
- And many more...

How do people benefit?



Advance in technology

Advance in science
brings advance in
technology

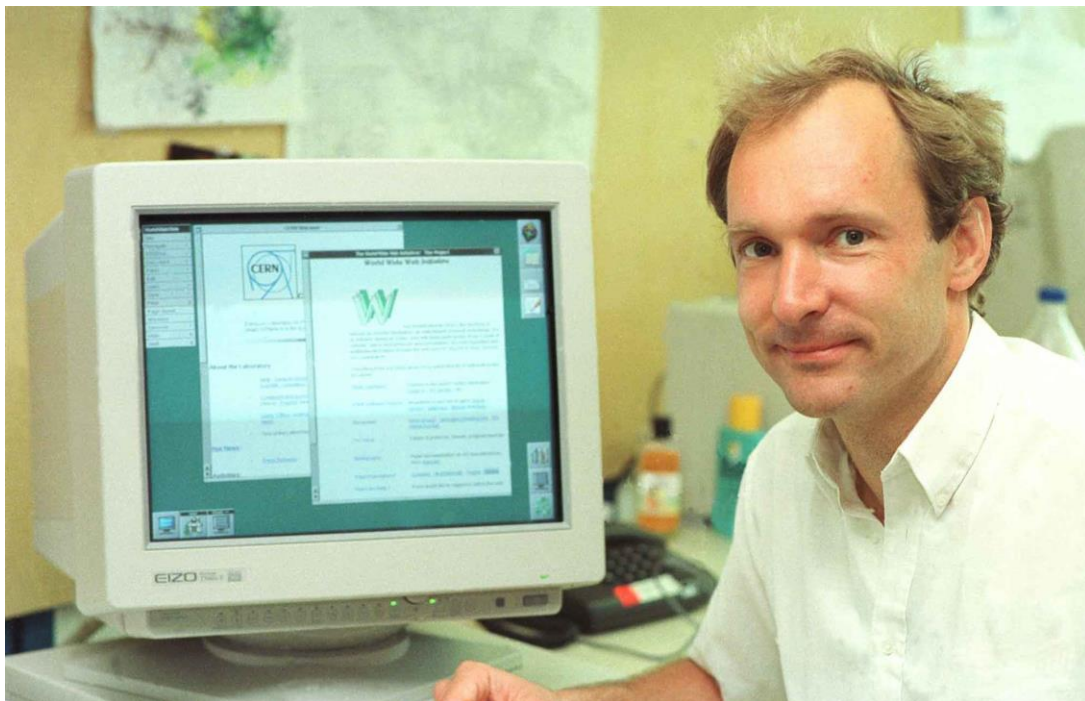




Advance in technology



- **World Wide Web**



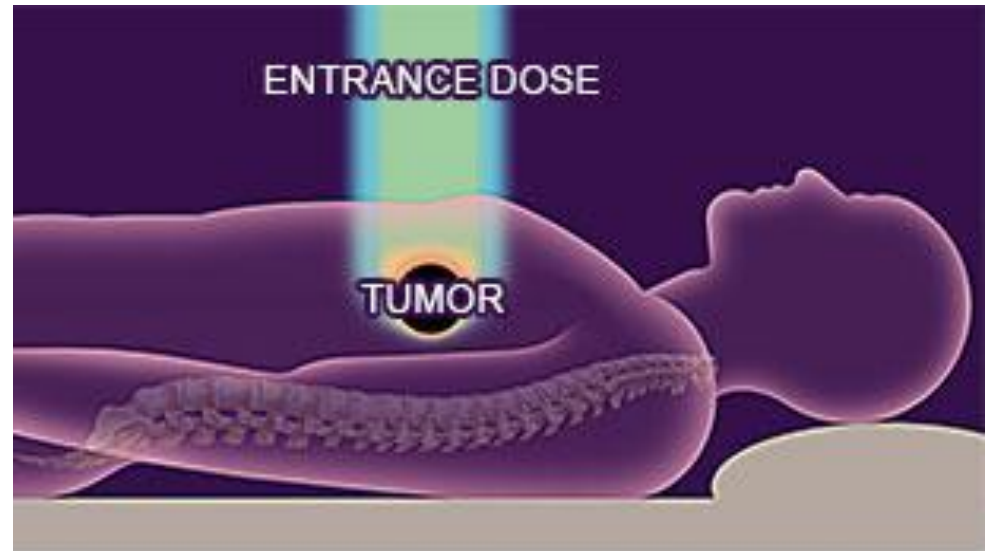
Tim Berners-Lee



Advance in technology



- World Wide Web
- **Hadron Therapy**



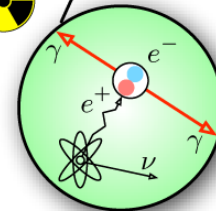
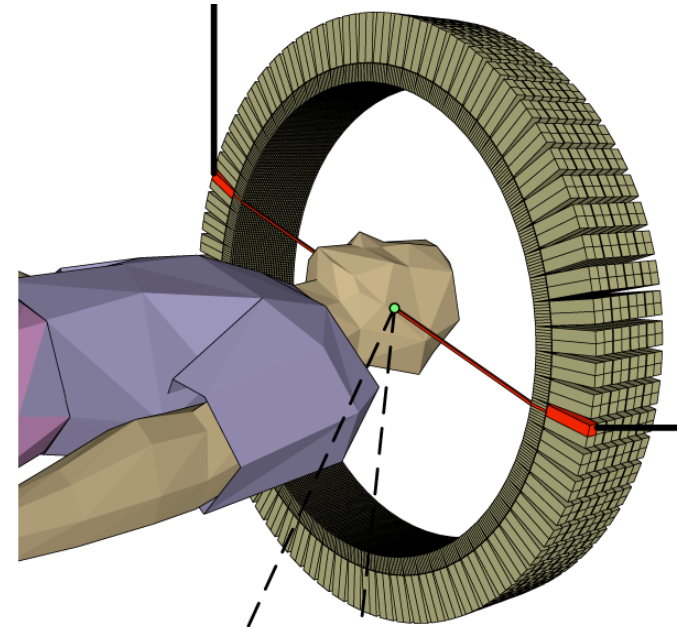
TARGETED PROTON THERAPY:
Deposits most energy on target



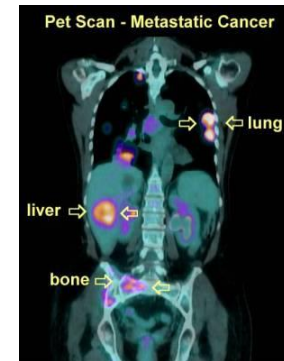
Advance in technology



- World Wide Web
- Hadron Therapy
- **Positron Emission Tomography (PET)**



Annihilation





Advance in technology



- World Wide Web
- Hadron Therapy
- Positron Emission Tomography (PET)
- **Evacuatable Solar Collectors**

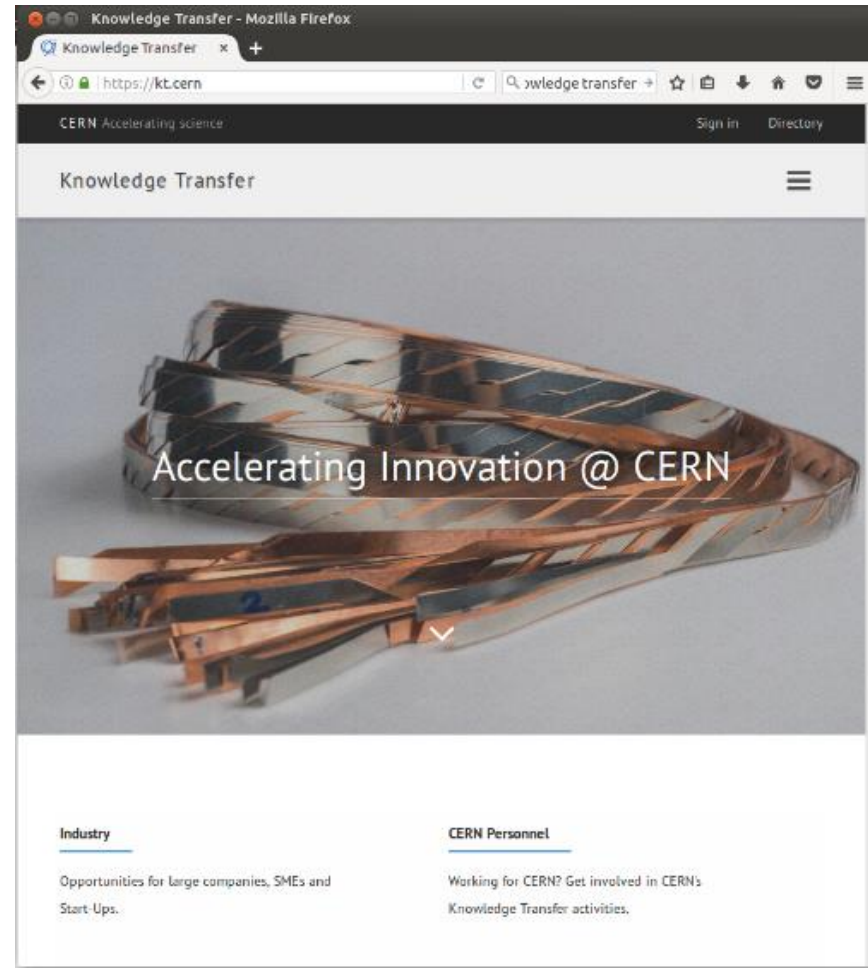




Advance in technology



- World Wide Web
- Hadron Therapy
- Positron Emission Tomography (PET)
- Evacuatable Solar Collectors
- **And many more...**



<https://kt.cern>

**We invite you to
ISPCS 2018**

at





ISPCS CERN 2018

September 30 - October 5

See you
@ CERN



EU-standard size man inside CERN's detector, Compact Muon Solenoid (21x15x15meter, 14k ton)