



Accélérateur de science

CS3 Conference Welcome



Massimo Lamanna / CERN IT

March 11th, 2024

Welcome at CERN, CS3 participants!

- 10th edition!
- 160 participants! (plus remote participation: max seat capacity reached)
- Exciting programme with a lots of interesting topics!
- Looking forward for a successful event!



Welcome at CERN

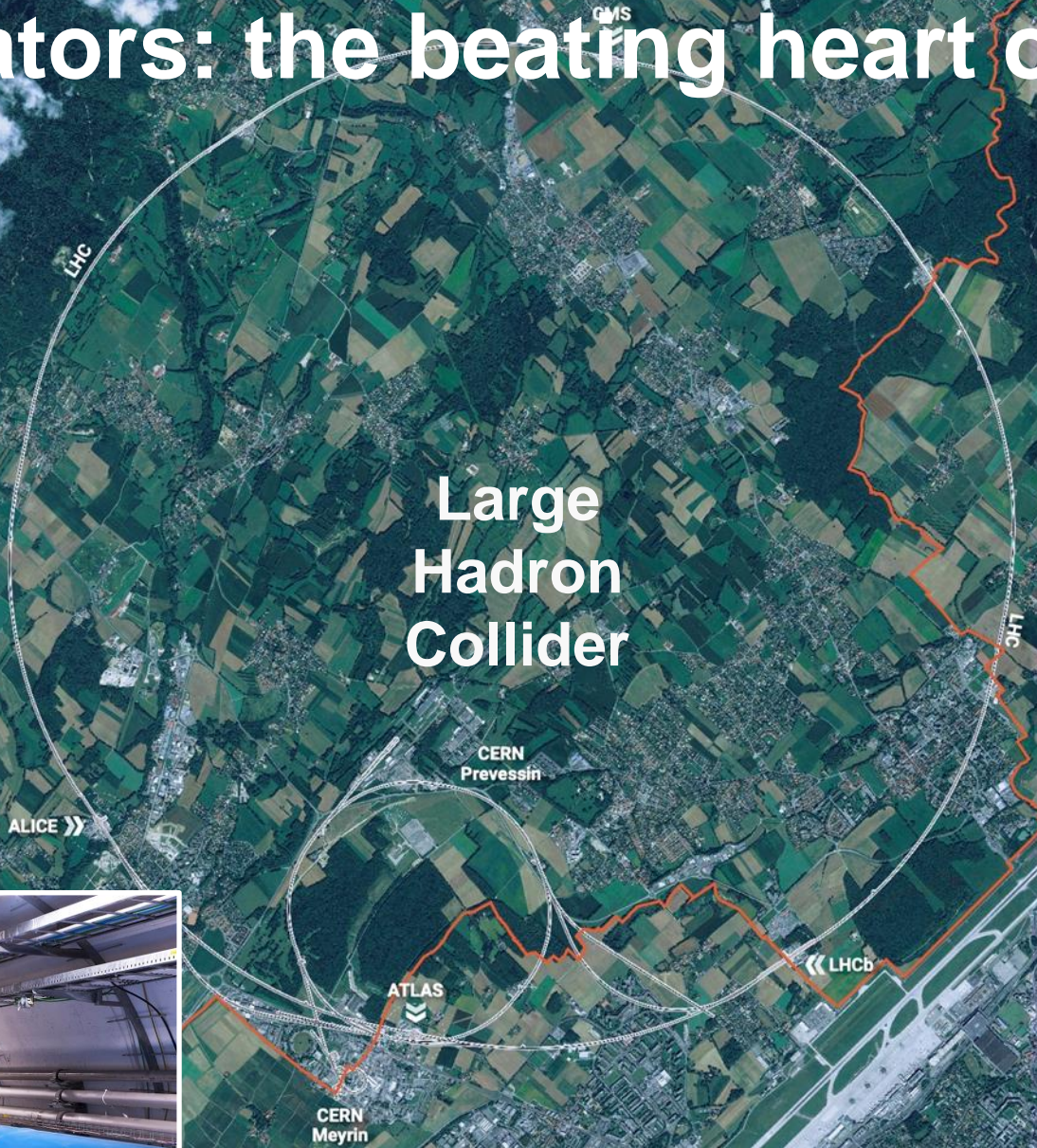
- CERN is 23 member states, 2,600 staff and more than 12,000 “users” (visiting scientists and engineers from more than 100 nationalities)
 - Founded in 1954
- Mandate
 - perform world-class research in fundamental physics
 - provide a unique range of particle accelerator facilities that enable research at the forefront of human knowledge
 - unite people from all over the world to push the frontiers of science and technology
 - train new generations of physicists, engineers and technicians, and engage all citizens in research and in the values of science

Accelerators: the beating heart of the laboratory

World-largest High-Energy Physics Lab

- LHC largest scientific instrument
- Hosted in a 27 km tunnel
- i.a. 1232 dipoles
- 40-100m underground
- Up to 2800 circulating bunches
- 13.6 TeV centre of mass energy in pp
- 700+ MJ kinetic energy stored in the beams

Large Hadron Collider



Fundamental Research



ALICE

Pb-Pb 5.36 TeV

LHC22s period

18th November 2022

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- **Fundamental research**

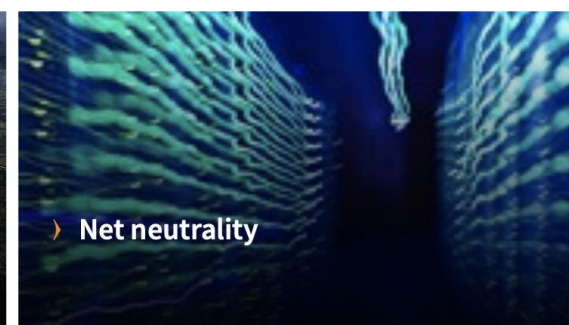
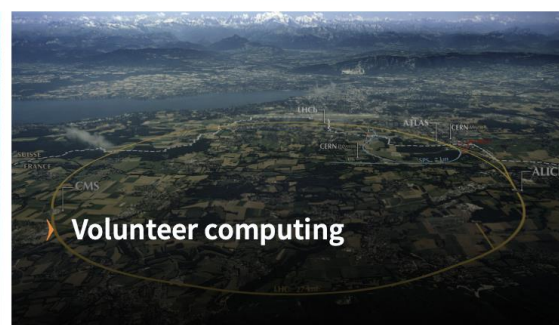
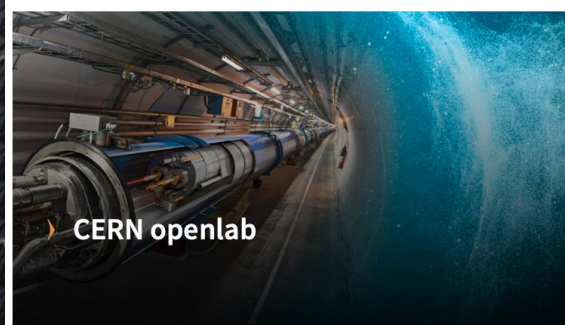
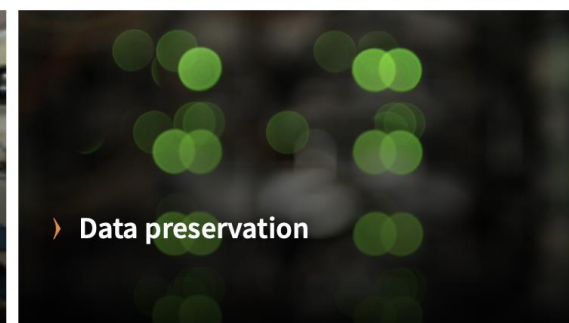
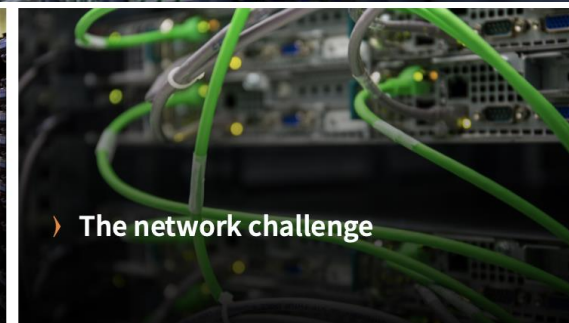
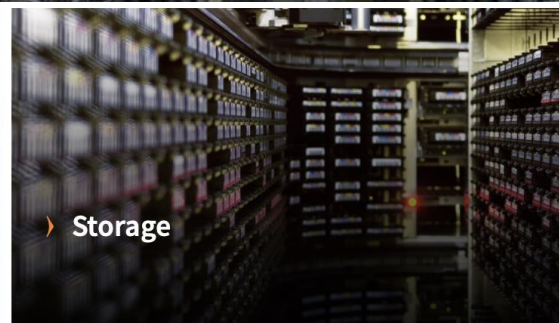
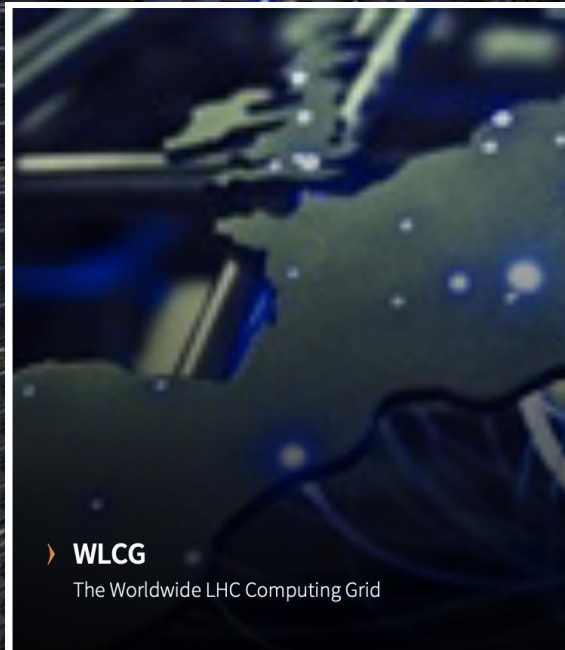
- Higgs discovery
- Standard-model and beyond
- LHC
 - Including Pb-Pb collisions (ALICE display)
- Fixed-target programme
- Antimatter physics
- → <https://home.cern/news/news/cern/cern-highlights-2023>

- **Technology challenges**

- E.g. 16 B channels in the ALICE ITS
- And of course many computing challenges!

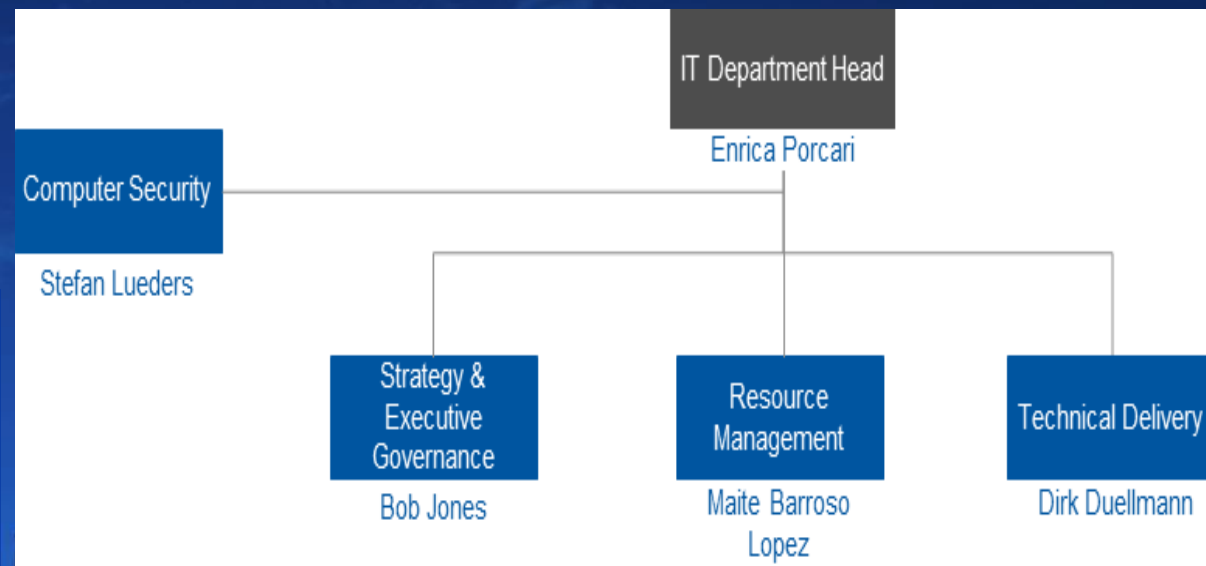
Computing

A central role in the fulfilment of CERN's mission



CERN IT Department

- **IT as Provider**
Meet the Information Technology needs of the CERN
- **IT as Optimizer**
Support CERN's existing scientific programmes by deploying production quality services
- **IT as Pioneer**
Prepare for the challenges of the scientific programmes' evolution and the laboratory's future
- **IT as Connector**
Increase CERN's scientific, societal and economic impact



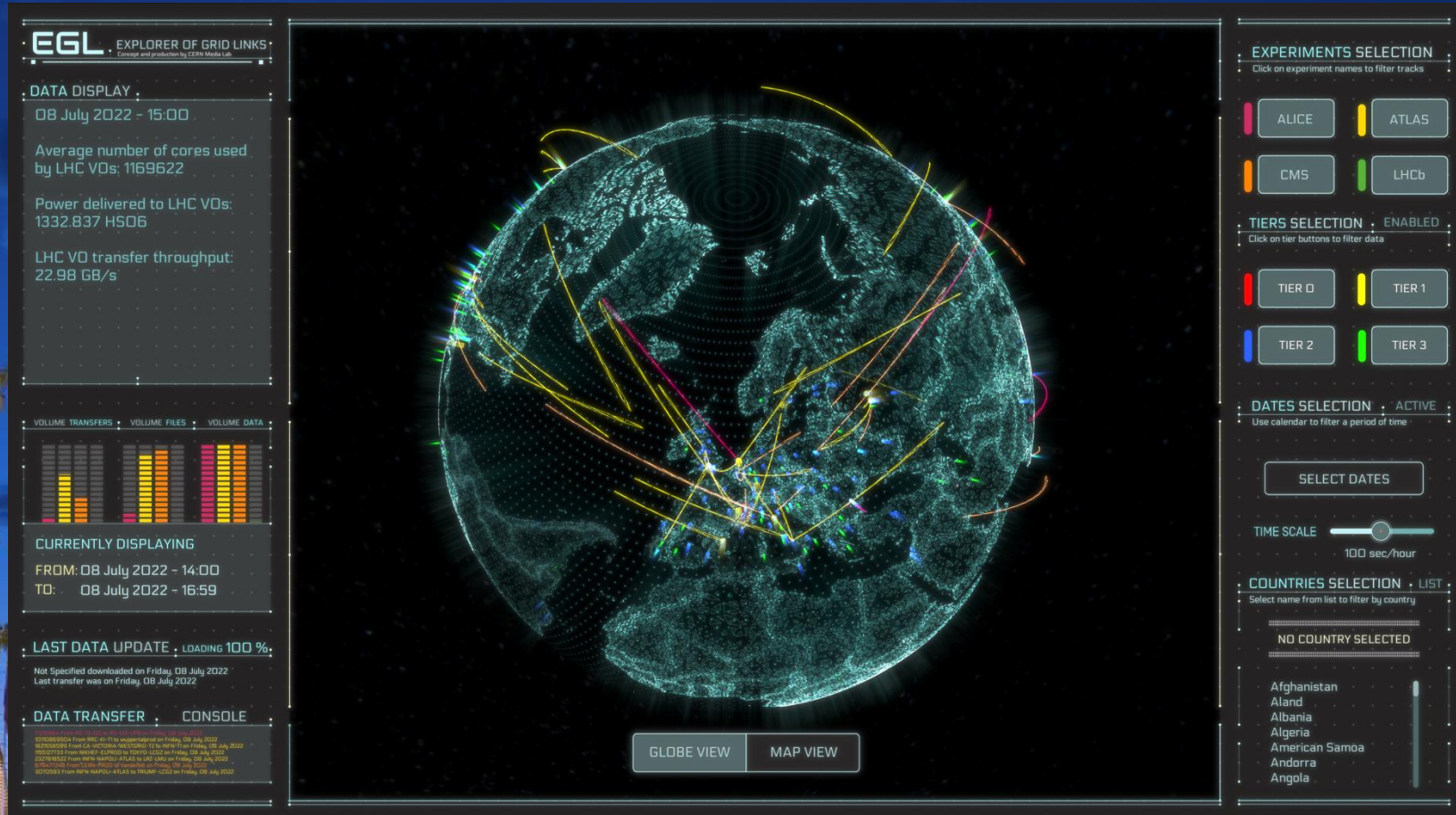
WLCG

Tier0 CERN is the Tier0 centre. It is federated with

- 15 Tier1 centres
- 95 Tier2 and 59 Tier3 centres
- Additional resources on specific solution from HPC centres and Cloud

Essential factor for the LHC success

- **High-Energy physics was always a big and innovative player in computing**



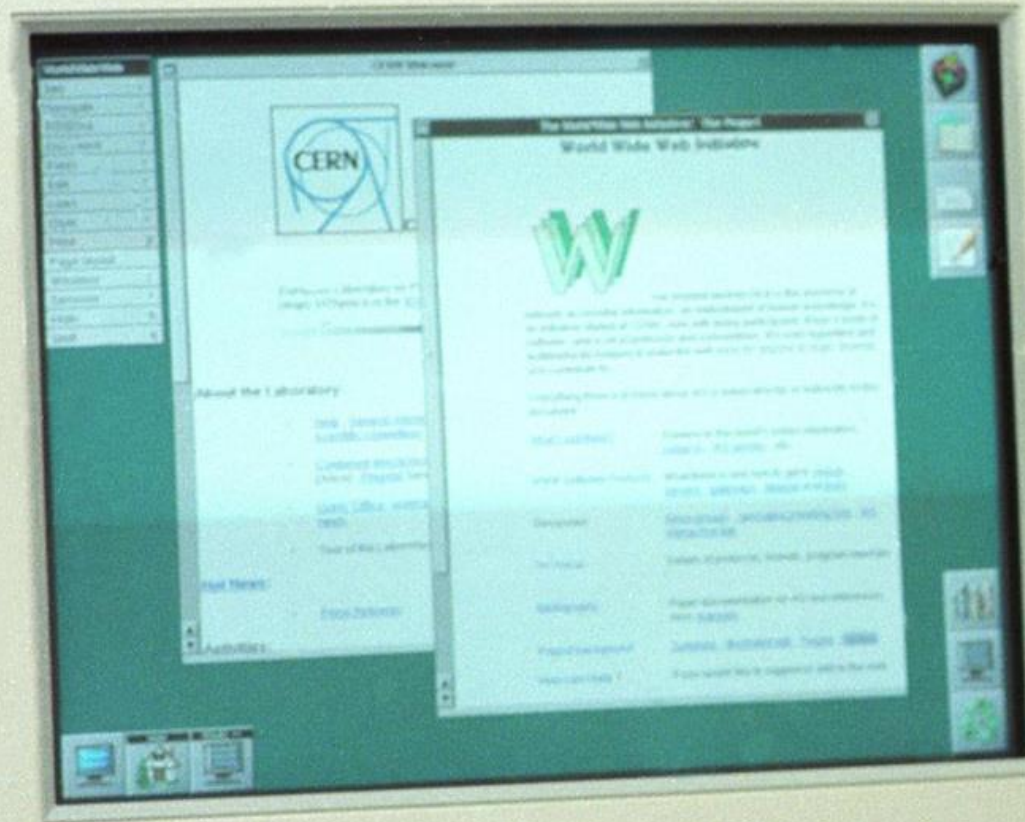
Store, distribute, process and analyse data

1.5 million cores in ~170 data centres and 42 countries

More than 1000 PB of data stored world-wide

“Suppose all the information stored on computers everywhere were linked. Suppose I could program my computer to create a space in which everything could be linked to everything.”

– Tim Berners-Lee, inventor of the World Wide Web





YEARS / ANS CERN
1954-2024



home.cern

Machine, detectors and computing meeting point

Long Term Infrastructure

