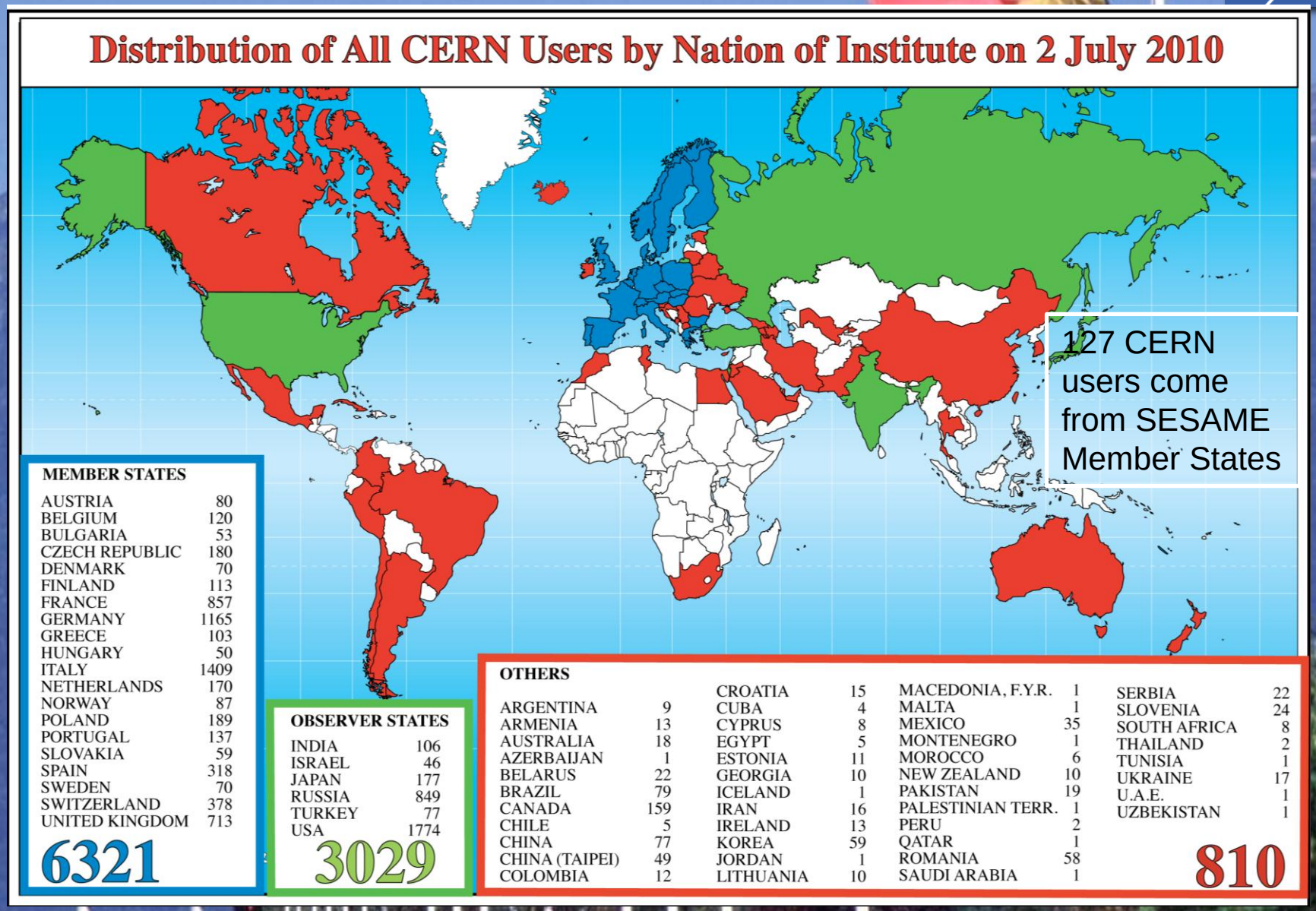

Welcome – مرحباً بكم
Professor Khaled Toukan
SESAME Director & Chairman of the
Jordan Atomic Energy Commission
Hashemite Kingdom of Jordan
to
CERN
Accelerating Science and Innovation

CERN was founded 1954: 12 European States
Today: 20 Member States

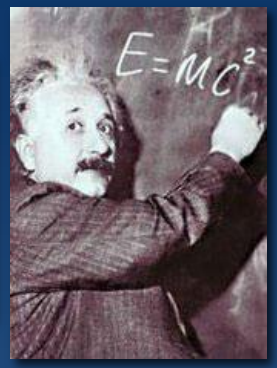
- ~ 2340 staff
- ~ 840 other paid personnel
- > 10000 users
- Budget (2010) ~1100 MCHF

- **20 Member States:** Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.
- **8 Observers to Council:** India, Israel, Japan, the Russian Federation, the United States of America, Turkey, the European Commission and UNESCO

CERN in Numbers



The Mission of CERN



- Push back the frontiers of knowledge

  E.g. the secrets of the Big Bang …what was the matter like within the first moments of the Universe's existence?

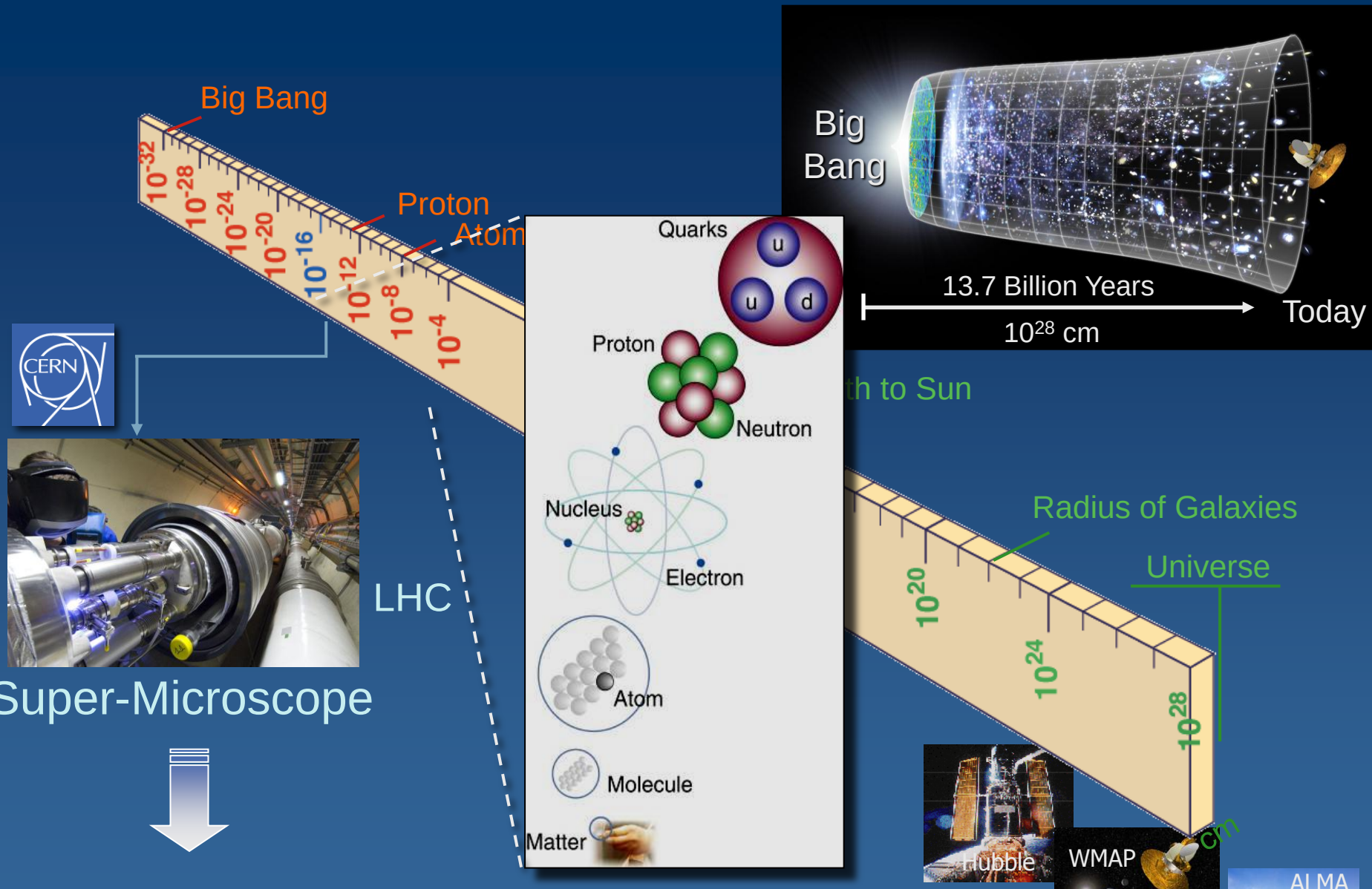
- Develop new technologies and Build advanced accelerators and detectors

  Information technology - the Web and the GRID

  Medicine - diagnosis and therapy

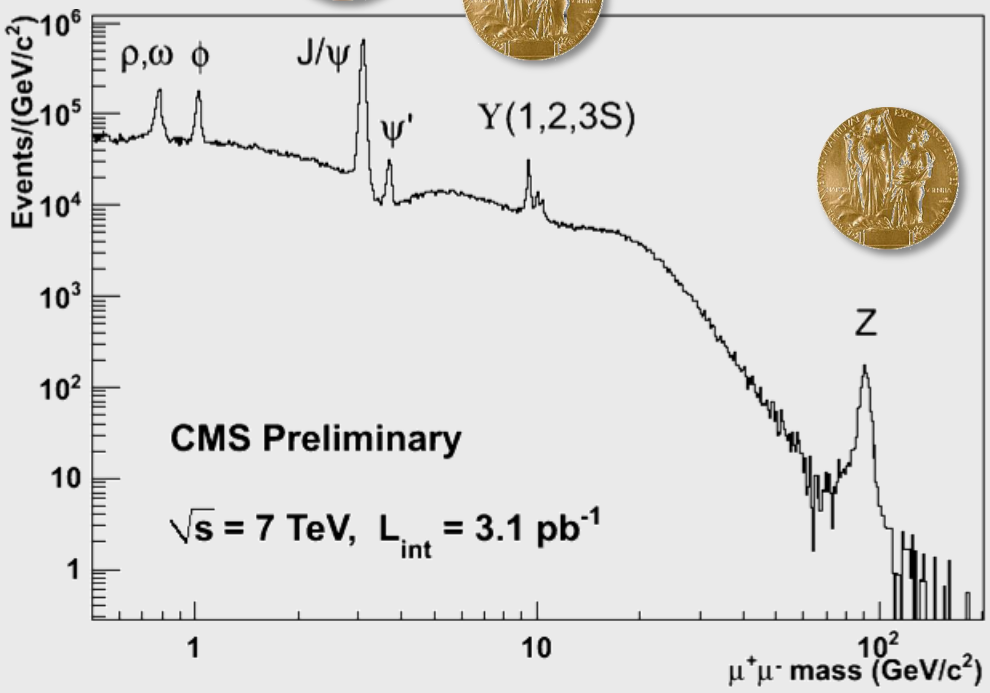
- Train scientists and engineers of tomorrow

- Unite nations & people from different cultures around peaceful science



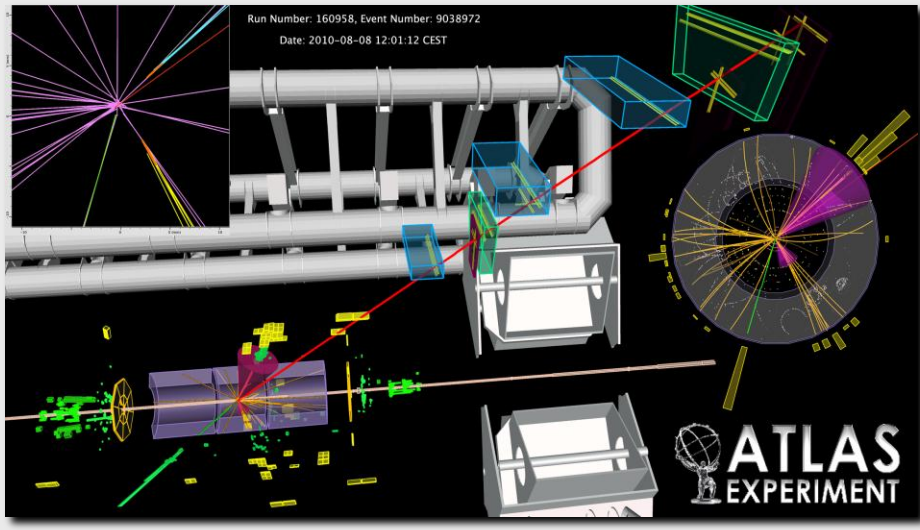
Study physics laws of first moments after Big Bang
increasing Symbiosis between Particle Physics,
Astrophysics and Cosmology

LHC Physics: First results after a few months



Era of top-quark physics has started:

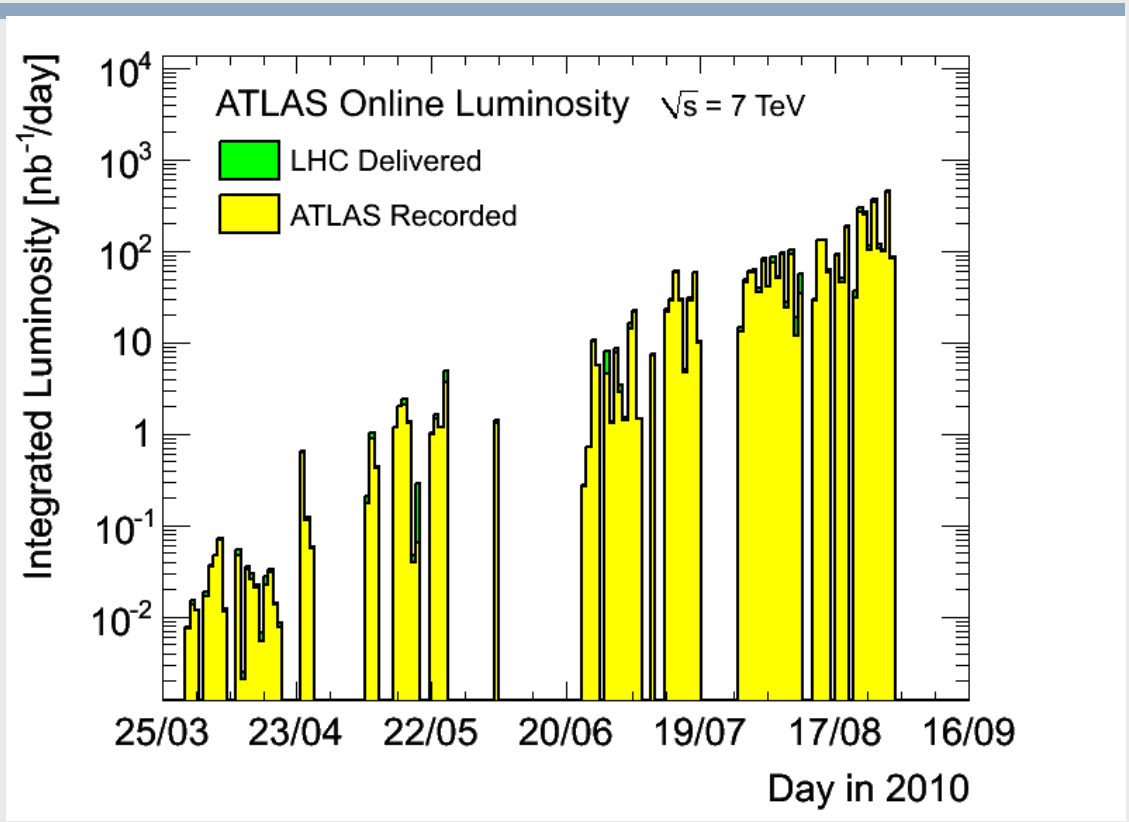
pp → tt → Wb Wb → e μ event with 2 identified b-jets

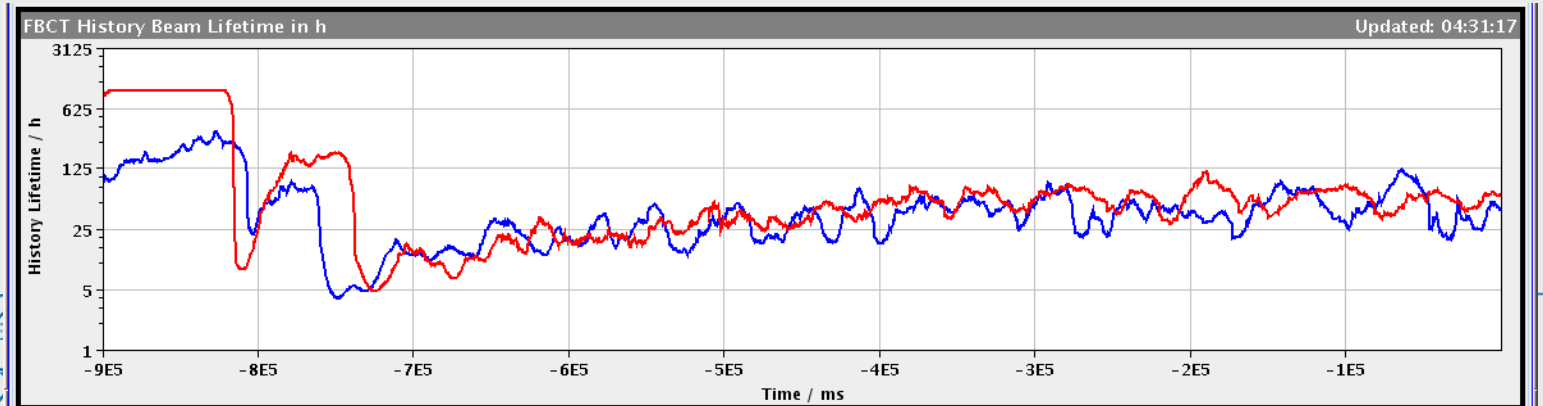


Accelerators, Detectors and Computing Grid:

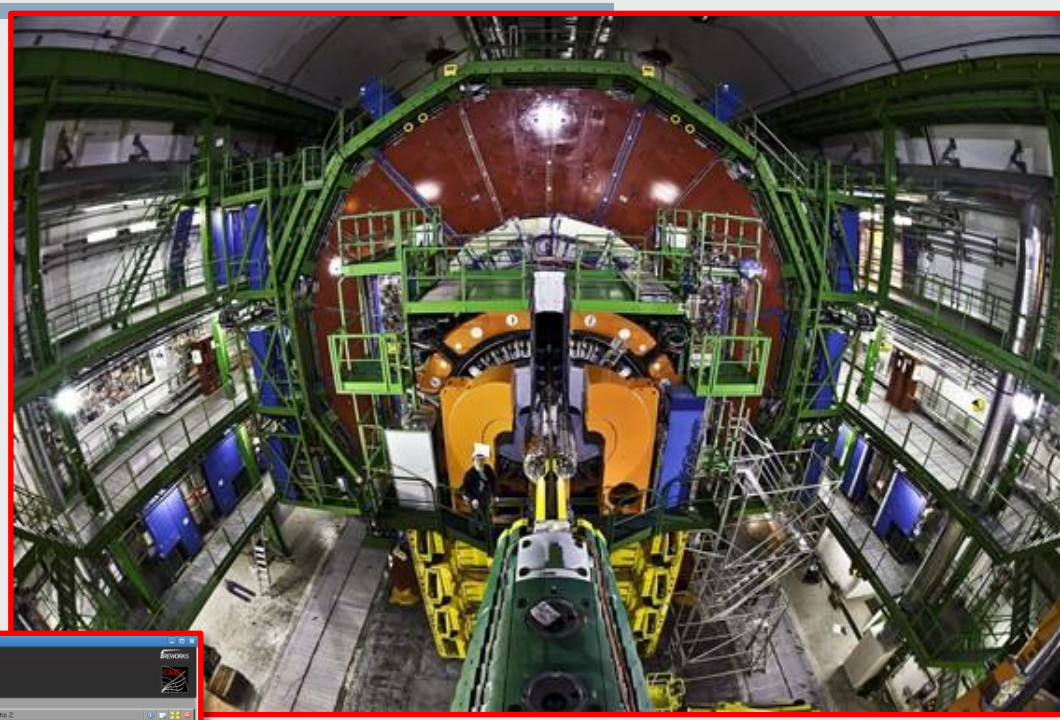
Highlights: CERN 2004-2010

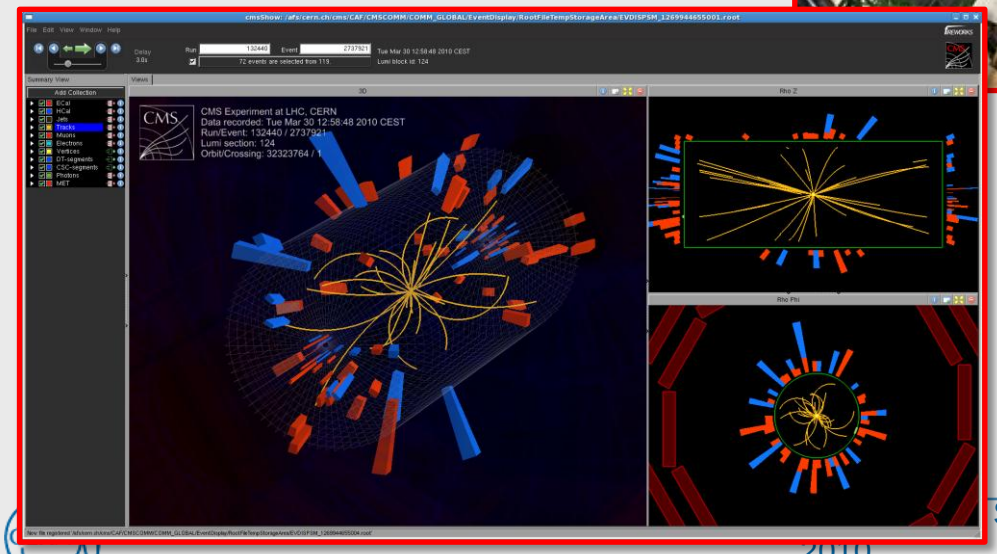
Highlights: LHC Performance 2010





Highlights: CERN 2004-2010

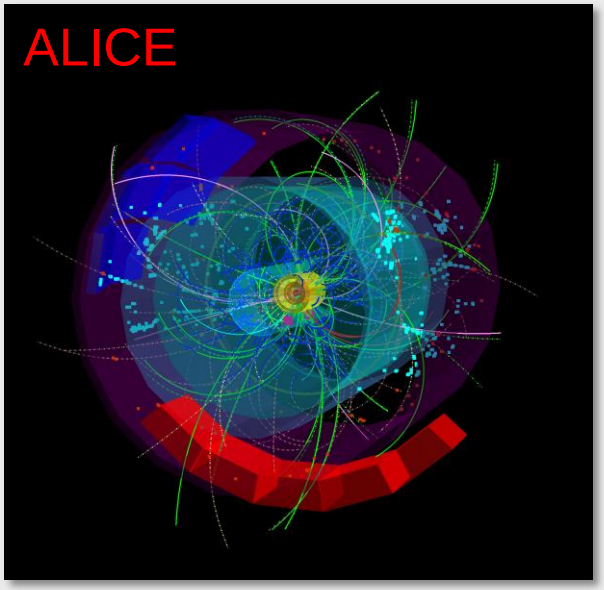


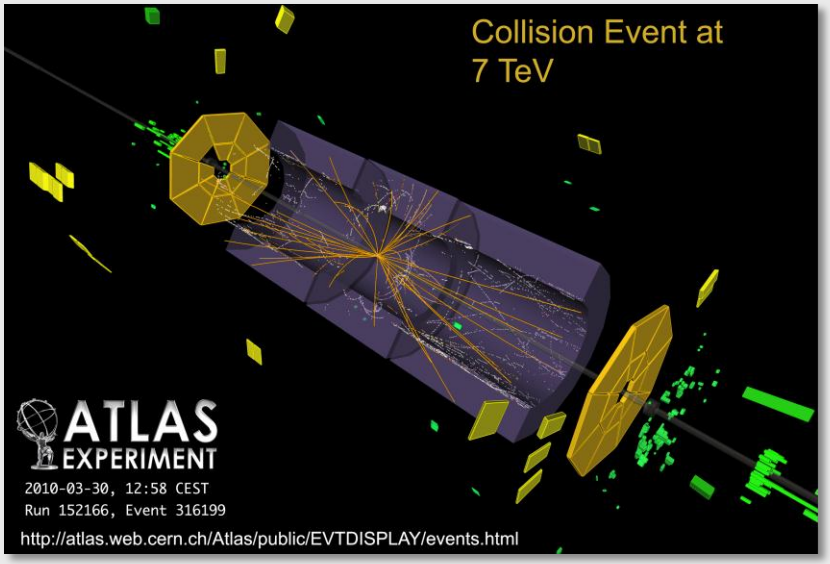


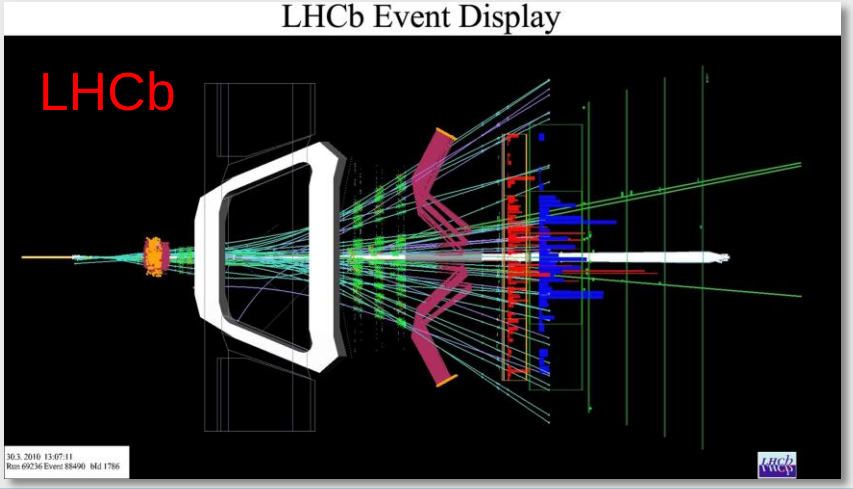
LHC experiment CMS,…

and likewise for ATLAS, LHCb and ALICE…

LHC: First collisions at 7 TeV on 30 March 2010



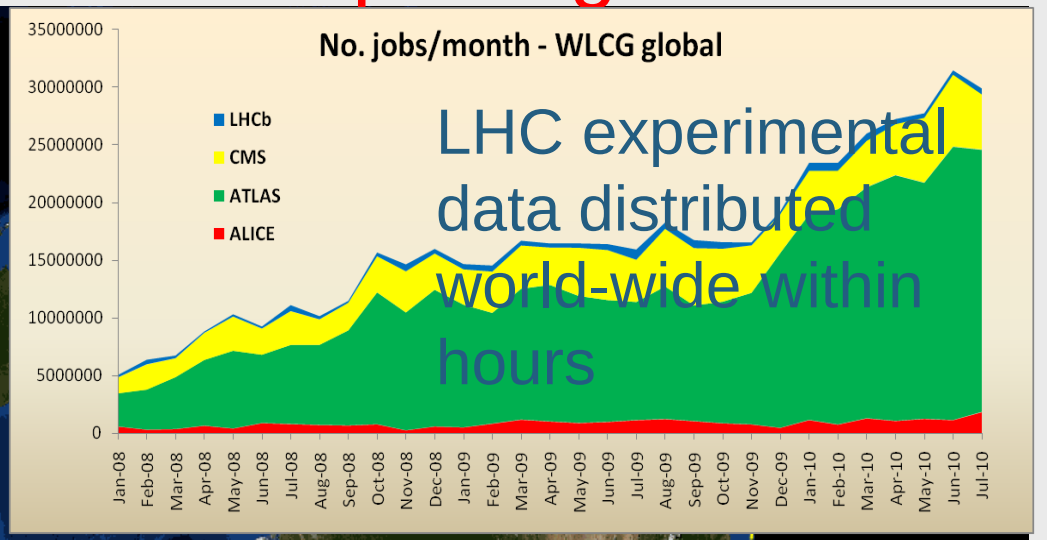




Highlights: Evolution of the computer grids

Enabling Grids for E-sciencE

February 2005
- 95 sites in 21 countries
- 8,000 CPUs
- <5 PetaBytes disk
- <1000 users
- 300,000 jobs/month



LHC experimental data distributed world-wide within hours

- ***LCG has been the driving force for the European multi-science Grid EGEE (Enabling Grids for E-sciencE)***

July 2010:
- >320 sites in 52 countries
- >250,000 CPU cores
- >40 PetaBytes disk, >61 PB tape
- >10,000 users
- >15 million jobs/month

21:13:50 UTC

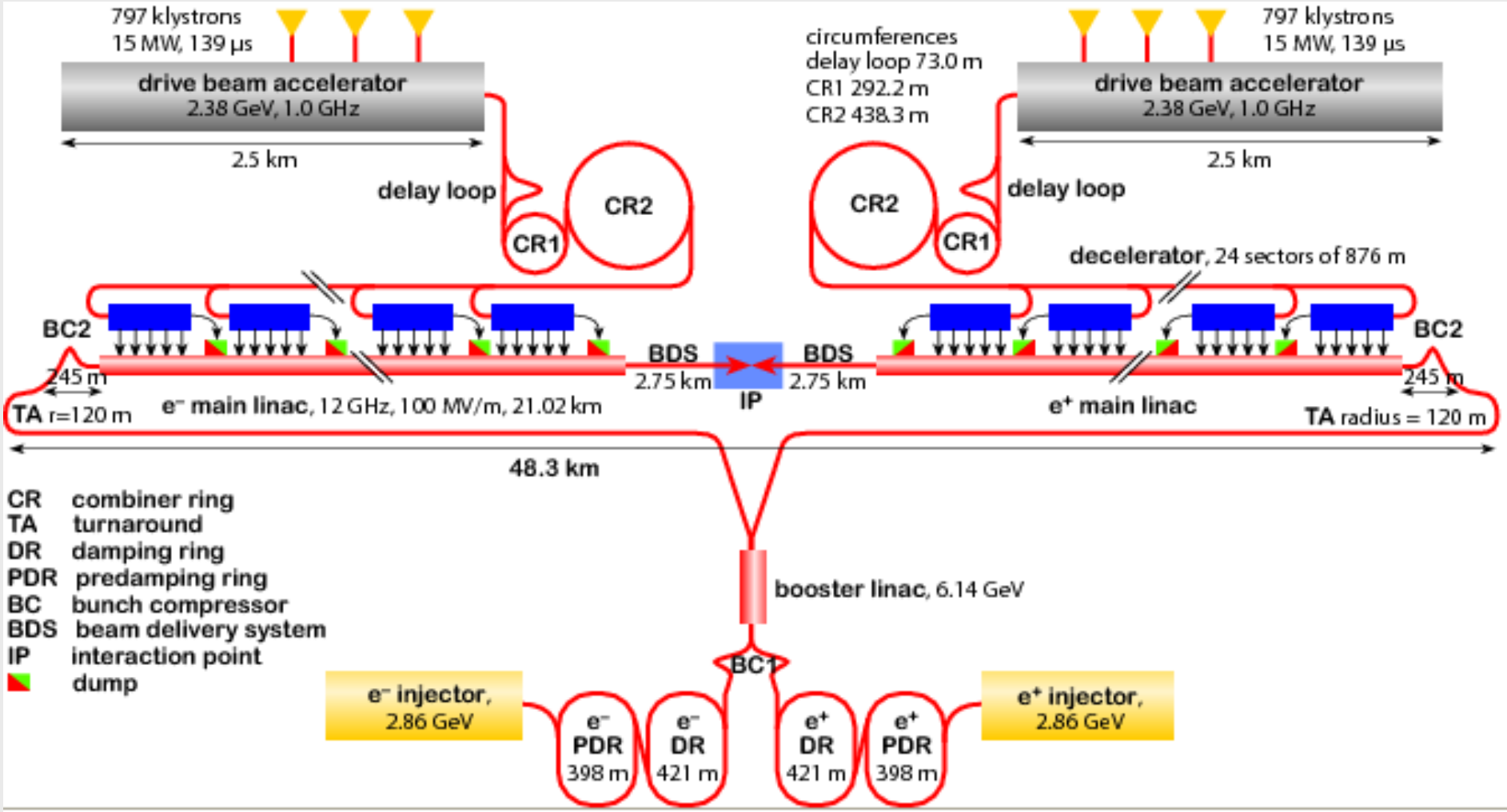
September 2010

GridPP
UK Computing for Particle Physics

CERN

Highlights: the CLIC Study

3 TeV c.m. Linear Lepton Collider

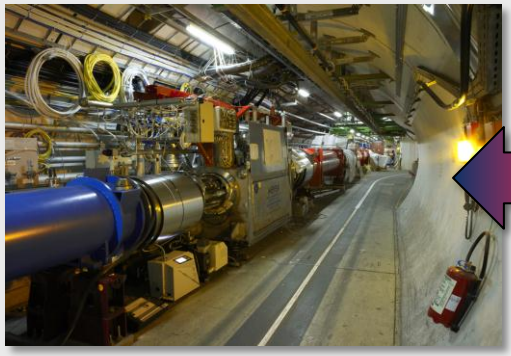


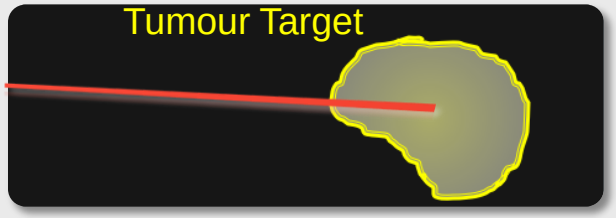
Applications of CERN Innovative Technologies

Medical imaging

Example: medical application

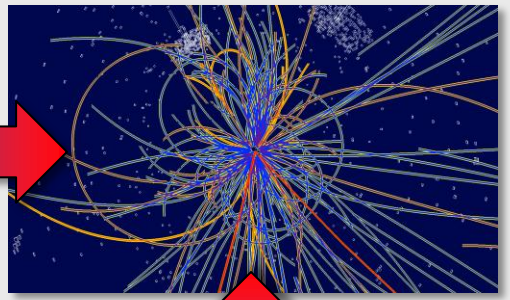
Accelerating particle beams

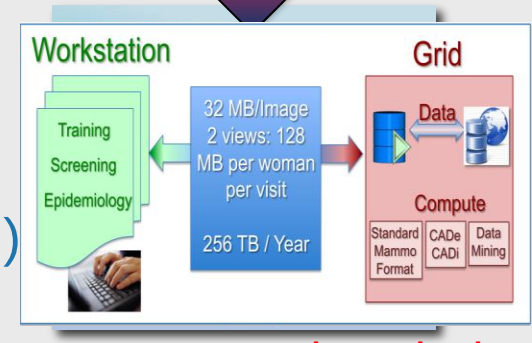




Charged hadron beam that loses energy in matter

Detecting particles





Large-scale **computing** (Grid)

Grid computing for medical data management and analysis

CERN Training Activities

Scientists & Engineers at CERN
Academic Training Programme


Latin American School of HEP
Viña del Mar, Chile, 2007

Young Researchers
CERN School of High Energy Physics
CERN School of Computing
CERN Accelerator School


School of Computing
2008 - Gjövik, Norway

S&T Students
Summer Students Programme

CERN Teacher Schools
International and National Programmes (300 participants/year)

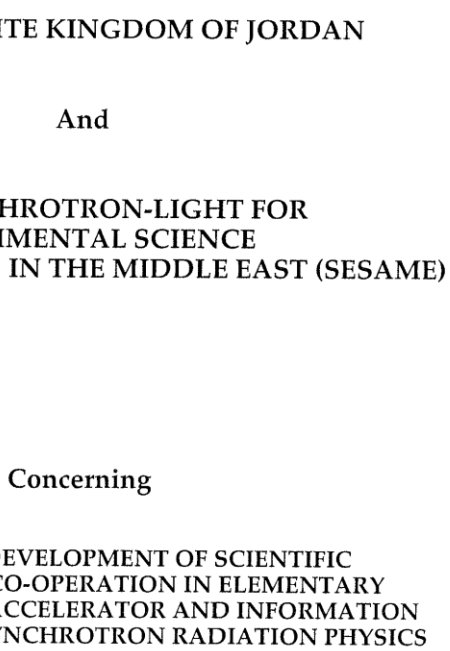
Jordan and CERN

The possibility of organizing training for Jordanian students at CERN has been discussed, within the framework of a planned Hashemite University master programme in nuclear physics, nuclear engineering, radiation protection and medical physics.

One Jordan student at CERN: Mr Mohamed Ebbeni, Magnet Group

CERN contact for Jordan: Prof. John Ellis
CERN contact for SESAME: Dr Jean-Pierre Koutchouk
Head of CERN International Relations: Prof. Felicitas Pauss

SESAME, Jordan and CERN



CO-OPERATION AGREEMENT

Between

THE EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)

And

THE HASHEMITE KINGDOM OF JORDAN

And

THE SYNCHROTRON-LIGHT FOR EXPERIMENTAL SCIENCE AND APPLICATIONS IN THE MIDDLE EAST (SESAME)

Concerning

THE FURTHER DEVELOPMENT OF SCIENTIFIC AND TECHNICAL CO-OPERATION IN ELEMENTARY PARTICLE PHYSICS, ACCELERATOR AND INFORMATION TECHNOLOGY AND SYNCHROTRON RADIATION PHYSICS

2004

After discussions initiated at the end of 2009 at CERN by Prof. Hoorani, a meeting with Dr Nadji in Paris (SOLEIL) in March 2010, a technical meeting was organized at CERN on July 27th between Prof. Hoorani, Dr Nadji and 11 CERN experts to define the details of the cooperation programme.

Four addenda are ready to be attached to the first Protocol to this Co-operation Agreement. Others are in preparation.

SESAME and CERN

Areas of collaboration/support:

1. Magnet Design Support and Review
2. Magnetic Measurements
3. Personnel protection and Safety
4. Shielding calculations with FLUKA

5. Radiation detectors
6. Access to some CERN IT resources
7. Support for training
8. Support from the CERN EU Office

Another CERN action in support of SESAME is being investigated.


Thank You!
و شكراً!