

Welcome - Καλώς ήρθατε

Mr. Apostolos Tzitzikostas
Governor
Region of Central Macedonia
Greece

to  *Accelerating Science and Innovation*

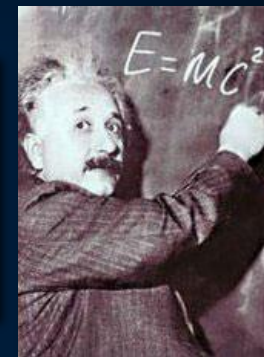




The Mission of CERN

❑ 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?

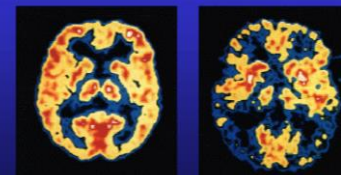


❑ Develop new technologies for accelerators and detectors

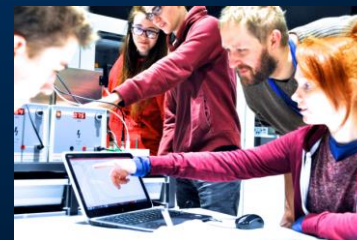
Information technology - the Web and the GRID
Medicine - diagnosis and therapy



Brain Metabolism in Alzheimer's Disease: PET Scan



❑ Train scientists and engineers of tomorrow



❑ Unite people from different countries and cultures



CERN: founded in 1954: 12 European States

“Science for Peace”

Today: 22 Member States

~ 2500 staff

~ 1800 other paid personnel

~ 13000 scientific users

Budget (2018) ~ 1150 MCHF

Member States: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom

Associate Members in the Pre-Stage to Membership: Cyprus, Serbia, Slovenia

Associate Member States: India, Lithuania, Pakistan, Turkey, Ukraine

Applications for Membership or Associate Membership:

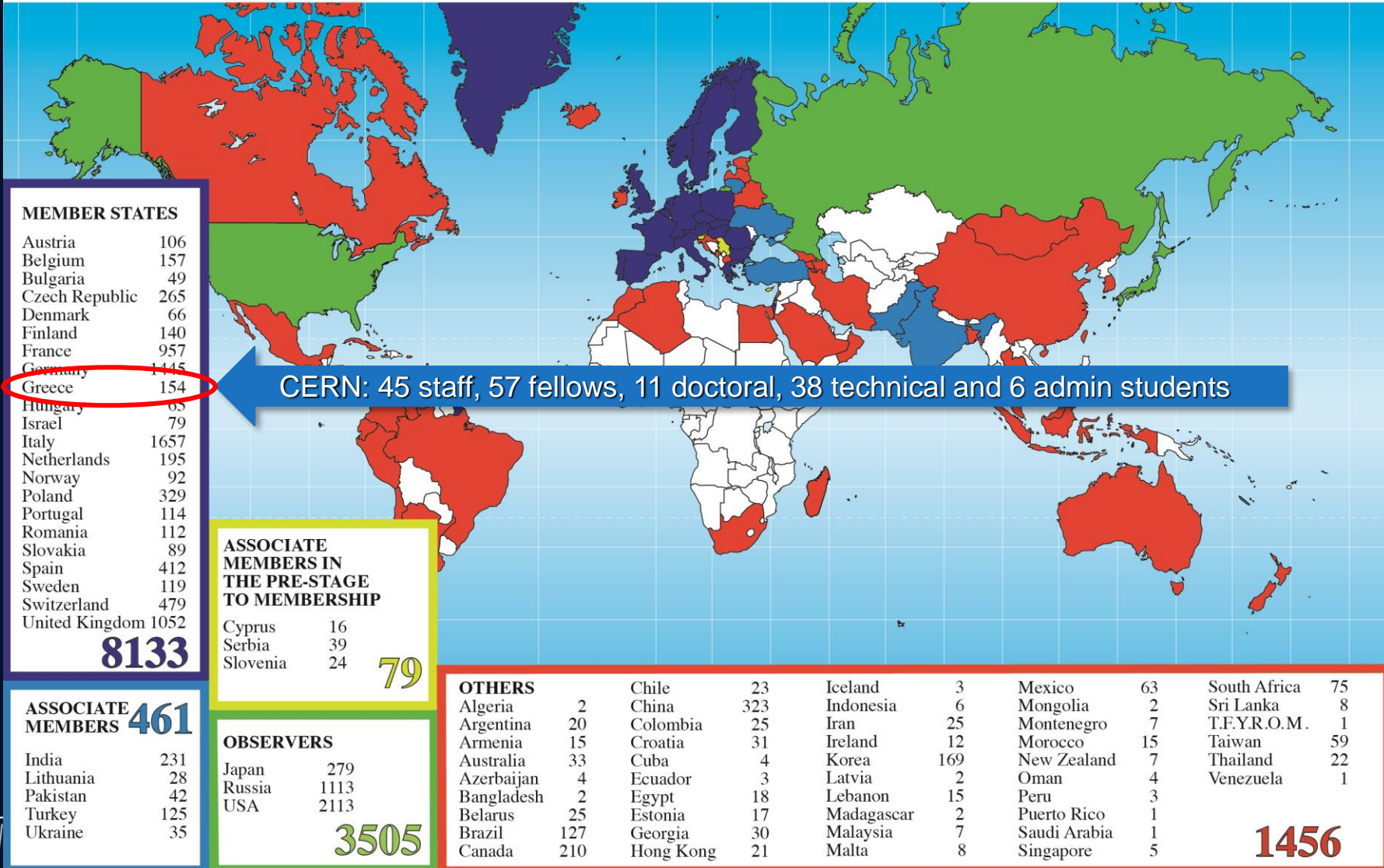
Brazil, Croatia, Estonia

Observers to Council: Japan, Russia, United States of America;
European Union, JINR and UNESCO



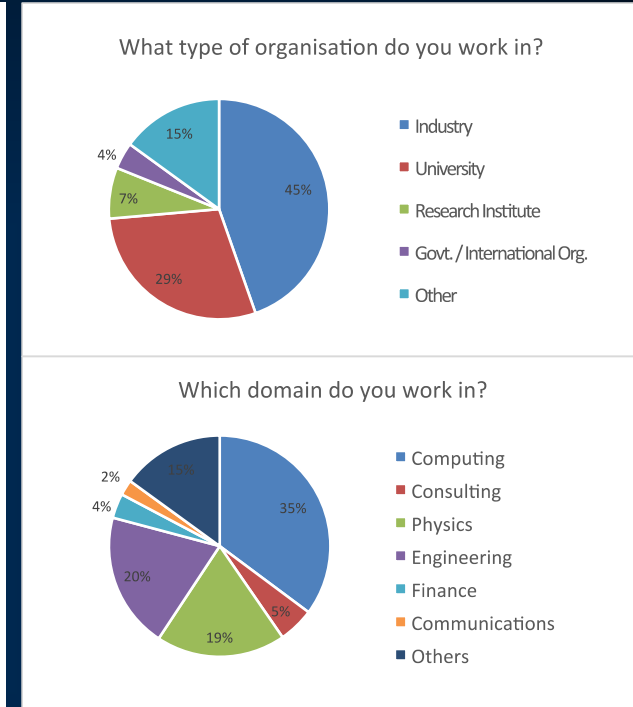
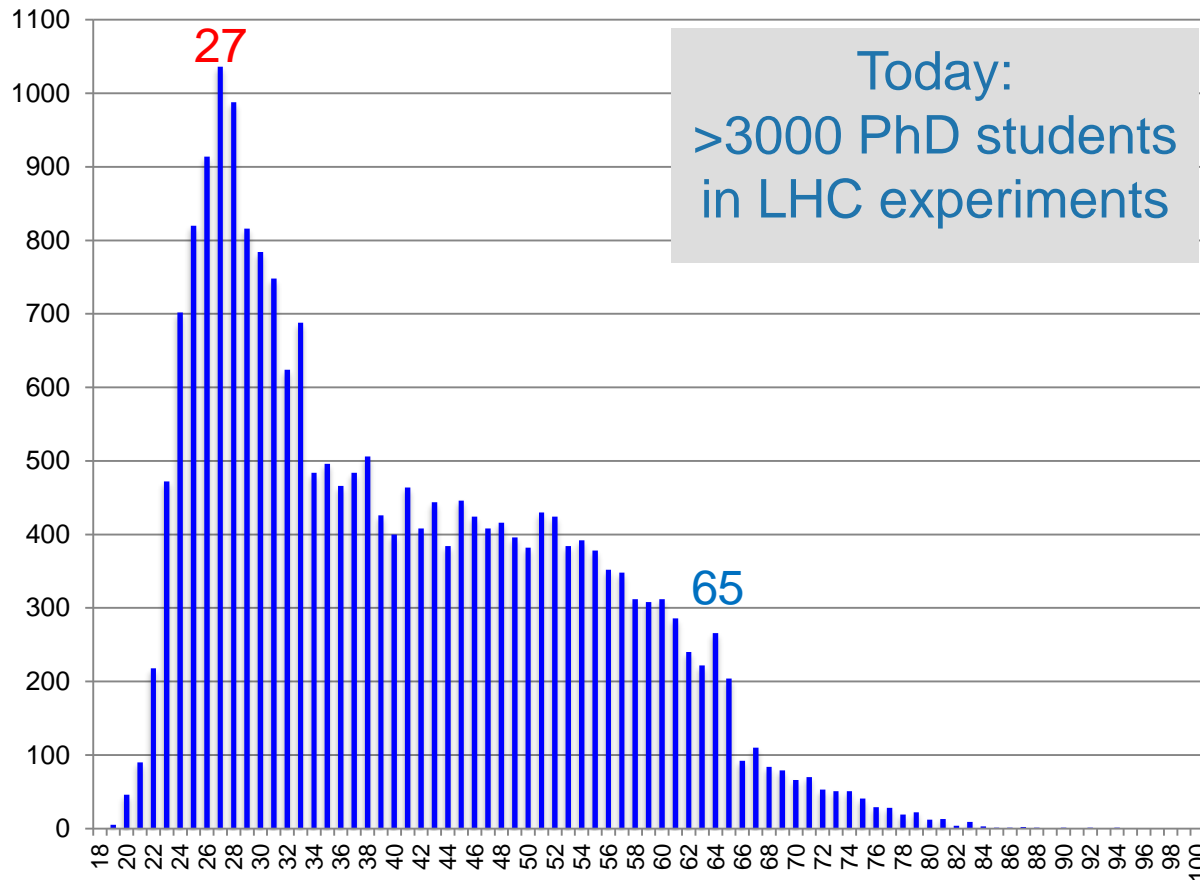
Science is getting more and more global

Distribution of All CERN Users by Location of Institute on 21 September 2018



Age Distribution of Scientists

- and where they go afterwards

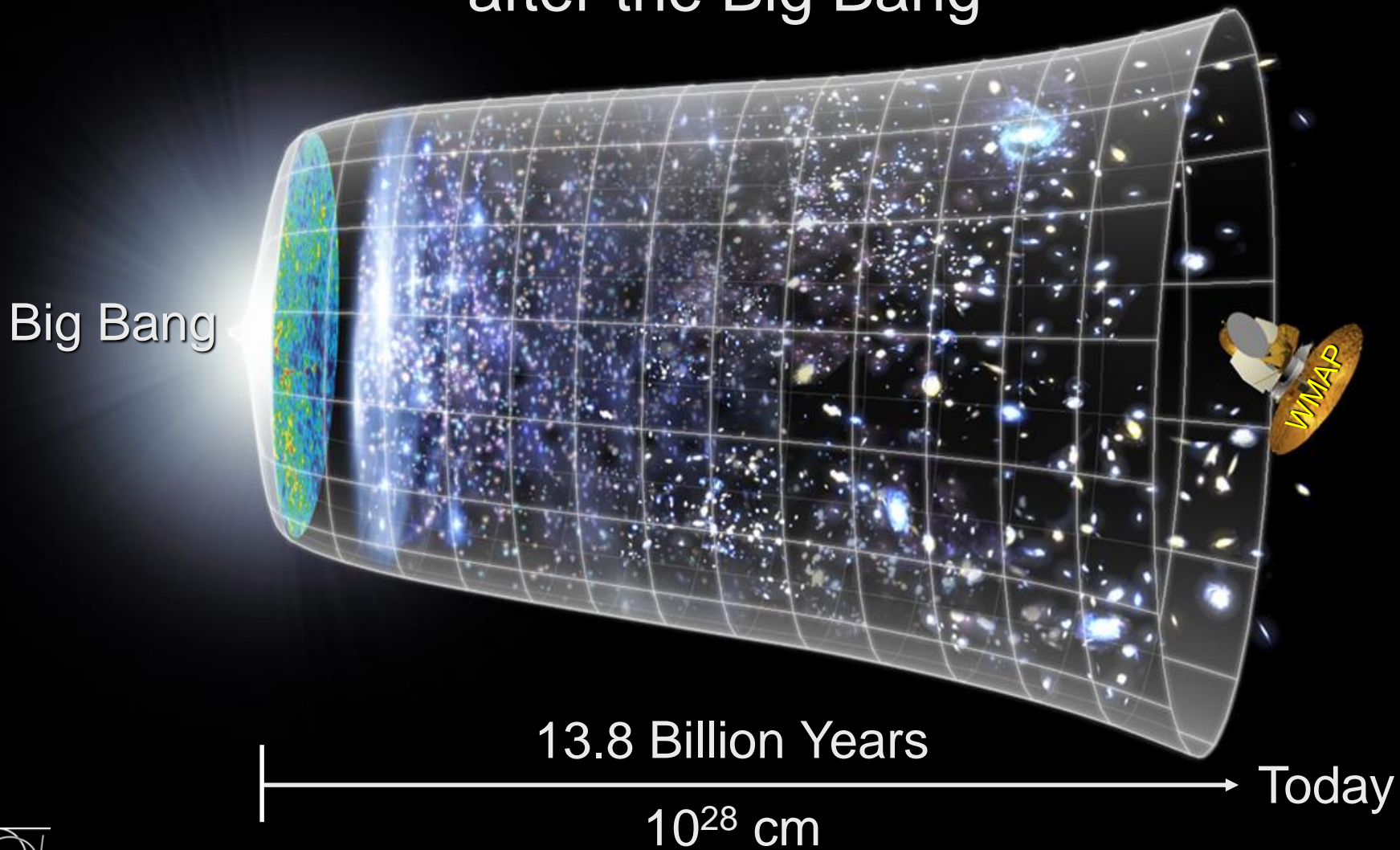


They do not all stay: where do they go?



Scientific Challenge:

to understand the very first moments of our Universe
after the Big Bang



2010: a New Era in Fundamental Science



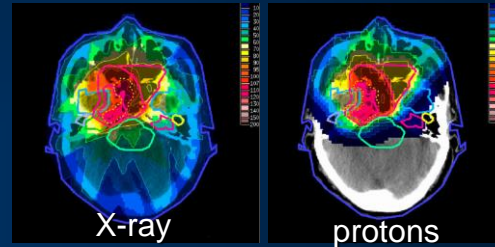
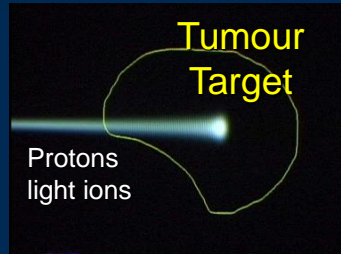
Medical Application as an Example of Particle Physics Spin-off

Combining Physics, ICT, Biology and Medicine to fight cancer



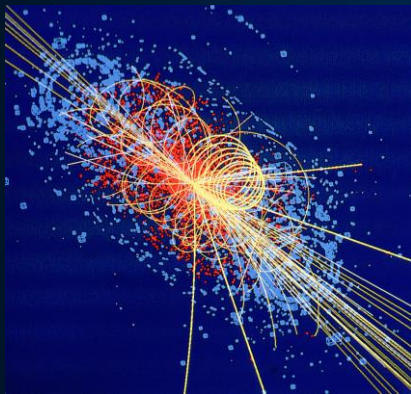
Hadron Therapy

Accelerating particle beams
~30'000 accelerators worldwide
~17'000 used for medicine



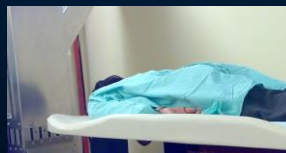
Leadership in Ion Beam Therapy now in Europe and Japan

>100'000 patients treated worldwide (45 facilities)
>50'000 patients treated in Europe (14 facilities)

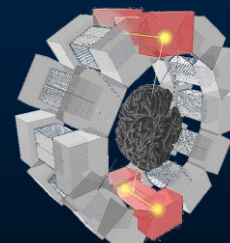


Imaging

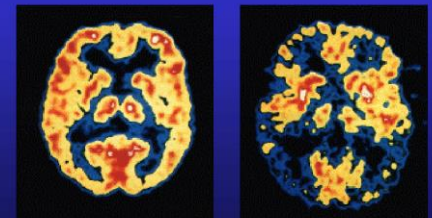
Clinical trial in Portugal, France and Italy for new breast imaging system (ClearPEM)



PET Scanner



Brain Metabolism in Alzheimer's Disease: PET Scan



Normal Brain Alzheimer's Disease



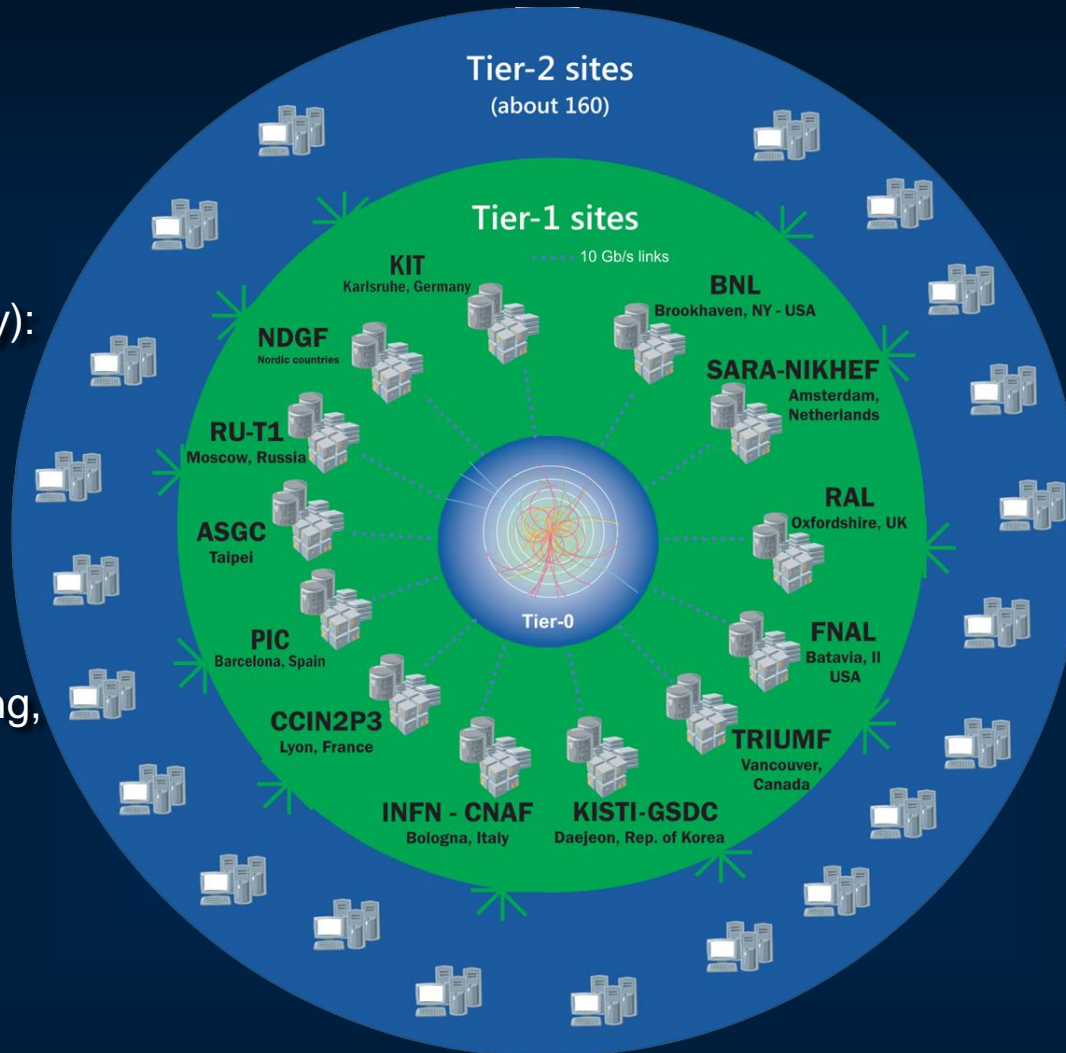
Detecting particles

The Worldwide LHC Computing Grid

Tier-0
(CERN and Hungary):
data recording,
reconstruction and
distribution

Tier-1: permanent
storage, reprocessing,
analysis

Tier-2: simulation,
end-user analysis



>170 sites in,
42 countries

750k CPU cores

800 PB of storage

> 2 million jobs/day

35 GB/s global
transfers

WLCG:

An International collaboration to distribute and analyse LHC data

Integrates computer centres worldwide that provide computing and storage resource into a single infrastructure accessible by all LHC physicists



CERN Education Activities

Scientists at CERN

Academic Training Programme



Young Researchers

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



Undergraduates

Summer Students
Programme



CERN Teacher Schools

International and National
Programmes

Public visitors

120 thousand per year





Greece and CERN



- Greece was one of the 12 founding Member States of CERN (1954)
 - Greek researchers (from Greece and abroad) have made notable contributions to experimental & theoretical particle physics.
 - Participated in several experiments at CERN's PS, SPS, ISR, SpS, LEP & LHC facilities.
- Today, several universities and institutes in Greece are involved in particle physics experiments at CERN.





Greece and CERN



- Strong commitment to LHC (ATLAS, CMS & ALICE)
- Also to other experiments (CAST, nTOF, ISOLDE, RD51)
- Accelerator science & technology
 - LHC, HL-LHC, CLIC, FCC



ATLAS Muon Spectrometer



CMS Preshower Detector





Thank You!
σας ευχαριστώ!



Accelerating Science and Innovation