

LIP 25 Years Anniversary

Herwig Schopper

CERN and University Hamburg



Congratulations!

Jose Mariano Gago, Founder,
Gaspar Barreira, longtime Director,
other members of Directorate,

Paulo Fonte (Coimbra), **Mario Pimenta** (Lisbon),
Rui Marques (Coimbra)

all Project Leaders
and all collaborators

**for 25 years of successful development and
work**

LIP was founded in May 1986 when Portugal joined CERN

- Via LIP and CERN Portugal joined the first international scientific organization later others followed,
e.g. ESA, NASA, Auger observatory
- the history of LIP is an essential part of the history of scientific research and training in Portugal
- opened a window for Portuguese science into the world

Contributed to modernisation of academic life



First hoisting of Portuguese flag at CERN 1986

Great pleasure to be here today - happy personal recollections of all these years

- ❖ As Director General CERN,
Portugal joined thanks to J. M. Gago
- ❖ As Evaluator for FCT
- ❖ As Member of LIP international Advisory
Committee



- Could see the fantastic rise of LIP
- Portuguese physics in general,
(thanks to FCT)
- met many friends,
- got to know Portuguese country and
great history

LIP started as 'Associated' Laboratory

Idea:

Extra-university research in close
operation with universities

But

LIP founded **formally** as **Associated Lab**
only in 2011 when 4 universities
IST, U Lisboa, U Coimbra, U Minho
joined LIP's

3 labs at Lisbon, Coimbra, Minho

Great achievement !

LIP

*Laboratório de Instrumentação e
Física Experimental de Partículas*

has become a laboratory of international recognition

170 collaborators, of which 70 PHD

Constantly evaluated by international committee

based on:

Publications

contributions to international experiments

Invitations to conferences

Results:

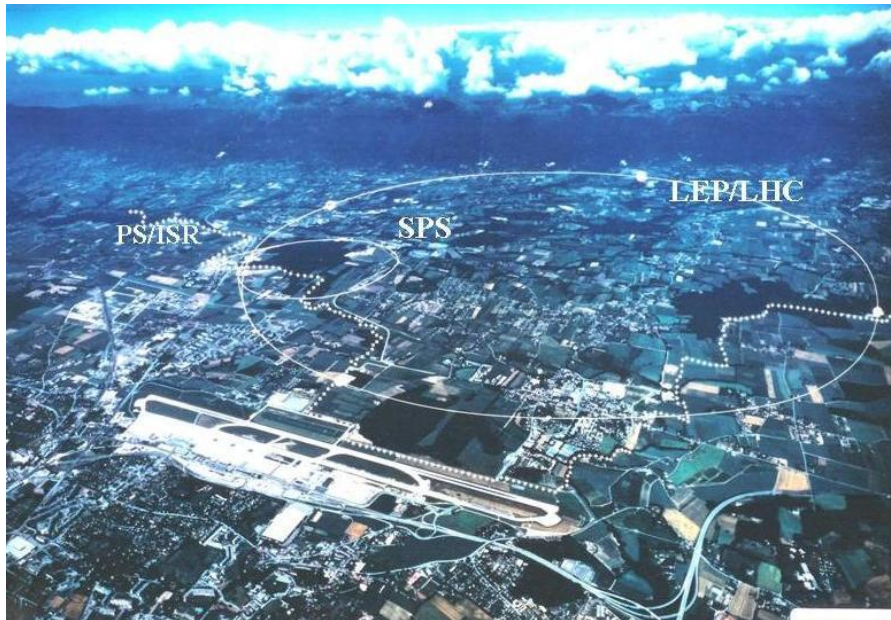
excellent lab

on international standards

Herwig Schopper, 25 years LIP 21.4.2012



**In 1986 when Portugal joined CERN:
exciting time building LEP (electron-positron collider)
followed now by LHC (proton-proton) in the same tunnel**



**Tunnel 27 km circumference,
largest instrument in world**

Portugal could **participate in
exciting discoveries** ,
is still participating now
LHC new record :
proton + proton 2 x 4 TeV,
**highest collision energies ever
produced on earth**

Imitating big bang

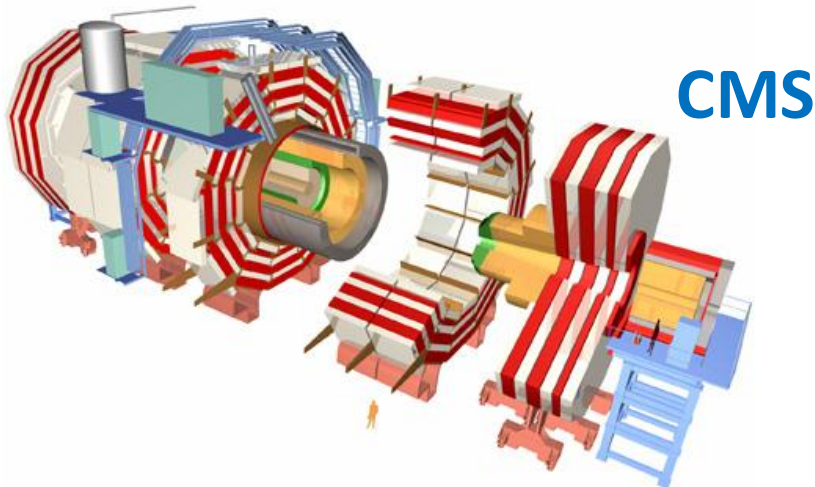
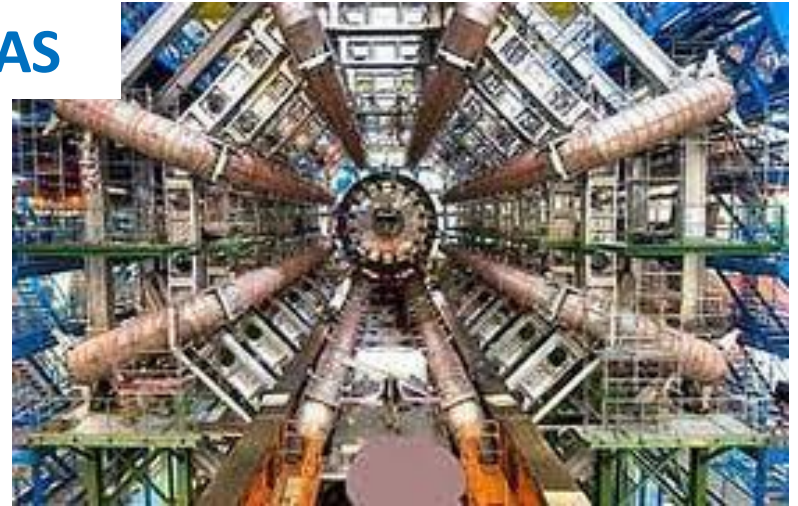
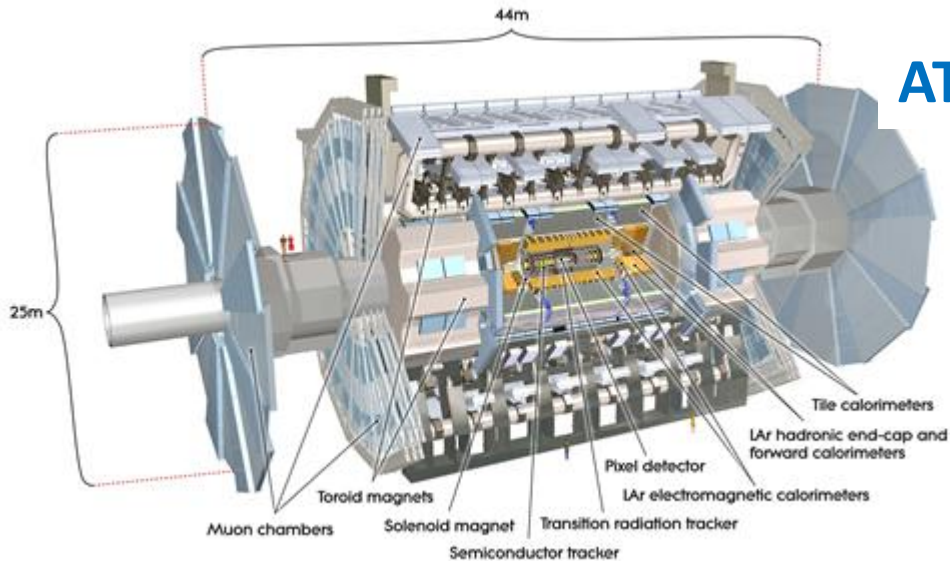
Pope John Paul II visiting CERN 1983



**My explanation:
Out of energy matter is created**

**Pope: Creaation is my business,
You produce matter**

LIP is participating and contributing to ATLAS and CMS at LHC



LIP also in several non-LHC experiments, e.g. COMPASS



**CERN is now world laboratory
with European Member States,
Associated States (USA, Russia,
..**Brasil**)**

**Portugal fully integrated in
International worldwide
collaboration**

**Example how to organise
international cooperation**





Minister J.M. Gago
At LHC inauguration in 2008

Since start-up in March 2010
LHC has already produced
many interesting results
This and in coming years
extremely exciting
expectations (Higgs, SUSY,??)

After many years of instrument construction,
now collecting the results (data acquisition, analysis)
Harvesting!! Many thesis!!

Unfortunately not my task to speak about physics
But listen to following talks

Worldwide LHC Computing GRID

successor of **World Wide Web** invented at CERN

Data taken at CERN are distributed immediately all over the world
LIP is 'tier 2 node' in this network

Important for scientific data transfer in general,
not only for high energy physics

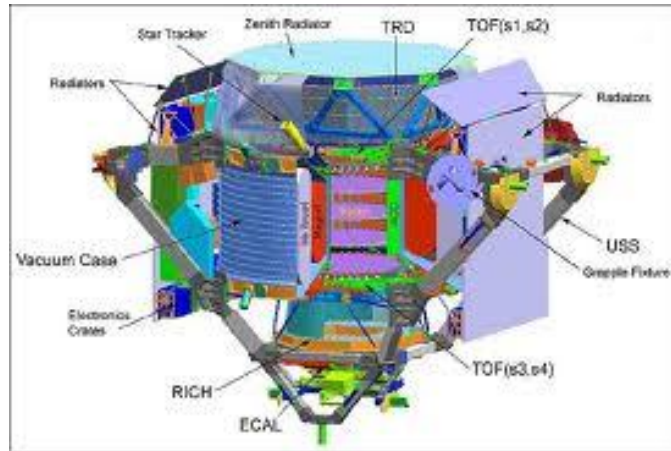


The LIP computing facilities
are the largest in the
Portuguese academic
community and are currently
used by more than 150
research institutions

LIP has developed into a differentiated lab with many activities

- ❖ **Experimental particle physics** (still main objective)
- ❖ **Experimental astroparticle experiments**
 - e.g. SNO, Zeplin, LUX, HECR looking for neutrinos, dark matter
- ❖ **Radiation detectors and associated instrumentation**
 - (mainly Coimbra since a long time)
- ❖ **Space physics AMS**
- ❖ **applications to medicine,**
 - PET – Mammography, computer simulations of irradiation
- ❖ **advanced computing and networking**
- ❖ **Training and teaching**
- ❖ **Technology transfer and outreach**

Impossible (and not my task) to review all the activities of LIP



Transport from CERN
to Cape Canaveral (Galaxy)

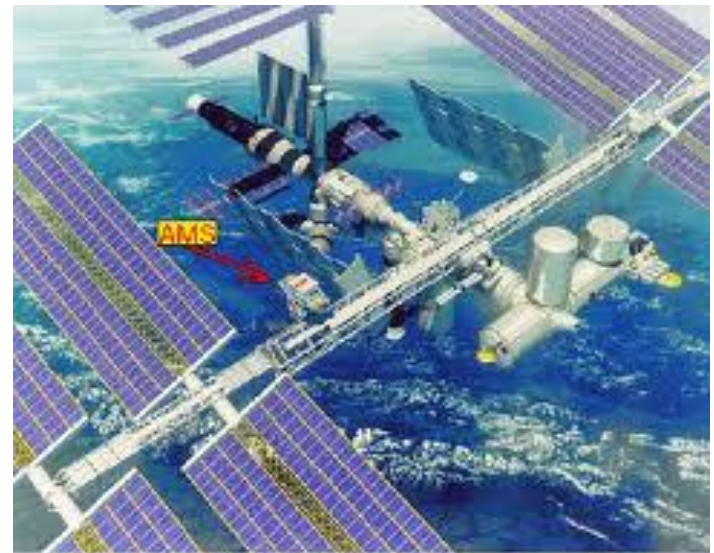
AMS

Only magnetic
spectrometer
in space

Only scientific experiment on Space Station!
Antisymmetry matter –antimatter in cosmos?



Controlroom for data aquisition at CERN



Arrival of AMS mounted on the International Space Station

Training and outreach

important objective of LIP

- **Post-graduate training:** master and PhD thesis in national and international cooperation
- **LIP researchers are hired professors at universities**
- LIP organises **schools and courses** on specific subjects
- LIP created **specific laboratory equipment for educational purposes**
- advanced training for young Portuguese graduates in international scientific organizations, CERN, ESA and ESO **in technological areas strategically important for competitiveness of Portuguese companies.**
- **Training of teachers**

Training of teachers

CERN programme for teachers (with UNESCO)
partly in their national language



**Portuguese
speaking teachers
visiting CERN
September 2009**

**Establishment of a UNESCO category 2 Centre for
Advanced Training of Scientists from Portuguese-
Speaking Countries in Areas of Basic Science
Link to Africa, South America (initiative Gago)**

LIP has made many valuable contributions to:

- **Elementary particle, astro- and nuclear physics**
- **Science in general**
- **Computing and networking**
- **Teaching and promoting young researchers**
- **Public outreach**
- **International cooperation**
- **and many more**

**Best wishes for the next
equally successful 25 years**

Meus mais sinceros parabéns