



E-infrastructure shared between Europe and Latin America

# The EELA Grid Infrastructure and HEP Applications in Latin America

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*I. de Ciencias Nucleares, UNAM, Mexico*

*CHEP 2007*

*September 1-7, 2007*

[www.eu-eela.org](http://www.eu-eela.org)

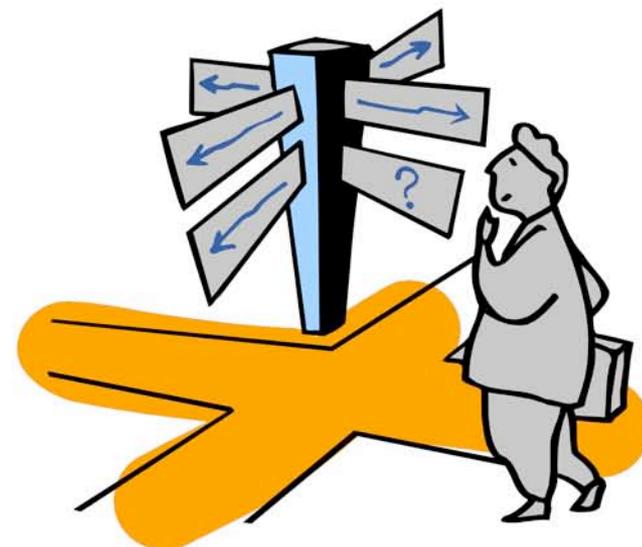


- **The EELA Project**

- Partners
- Infrastructure
- Outreach and Dissemination

- **EELA Applications**

- Biomed
- **HEP**
- E-Learning
- Climate



**BUILD A BRIDGE BETWEEN  
CONSOLIDATED E-INFRASTRUCTURE  
INITIATIVES IN EUROPE AND  
EMERGING ONES IN LATIN AMERICA**

**STRENGTHEN COLLABORATION  
BETWEEN LATIN AMERICA AND  
EUROPE**

Italy: INFN

Portugal: LIP

Spain: **CIEMAT**, CSIC, Red.ES, UC, UPV  
CERN



Argentina: UNLP

Brazil: CEDERJ, RNP, UFF, UFRJ

Chile: REUNA, UDEC, UTFSM

Cuba: CUBAENERGIA

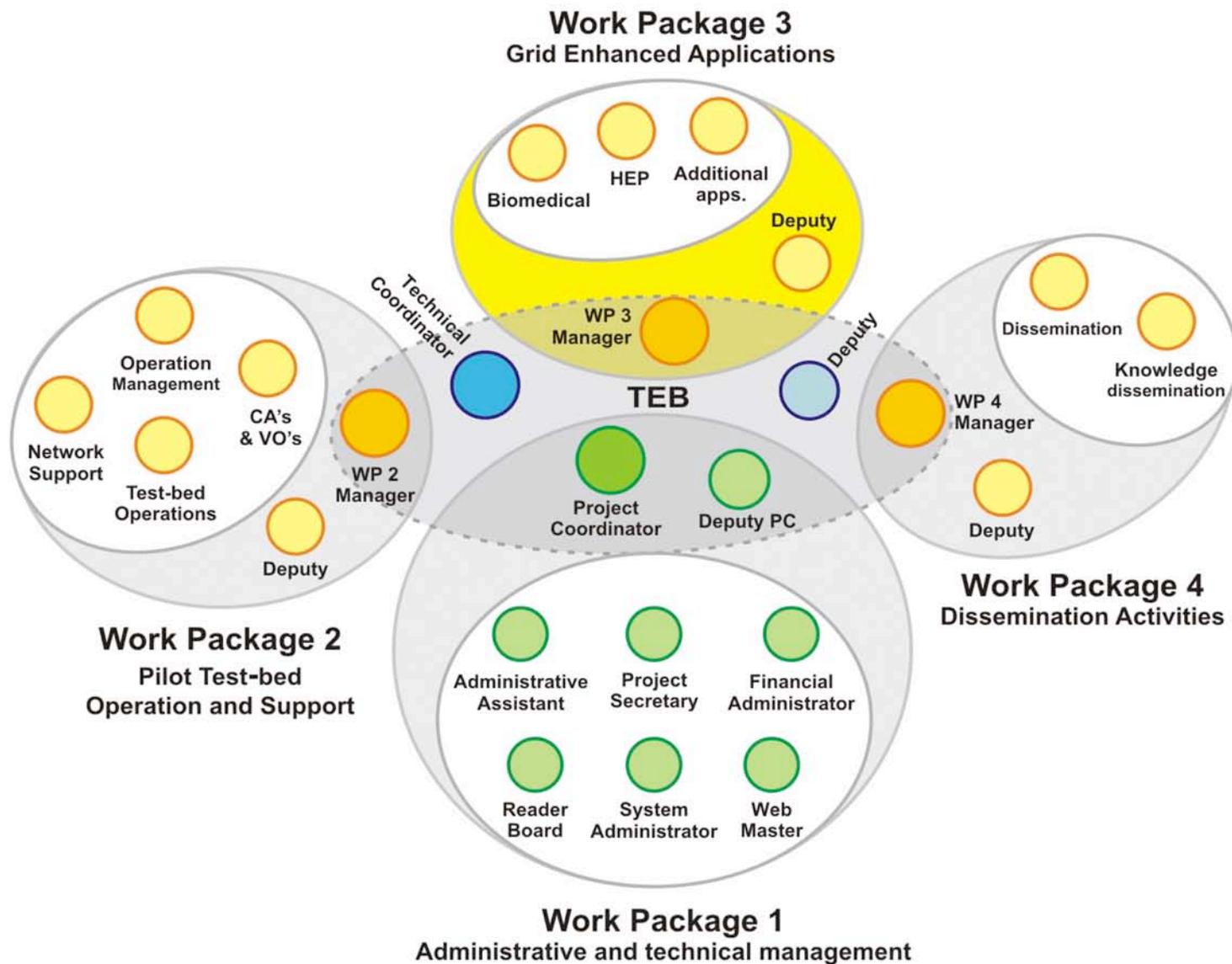
Mexico: UNAM

Peru: SENAMHI

Venezuela: ULA

CLARA

- **10 Countries**
- **21 Partners**





# THE EELA e-INFRASTRUCTURE

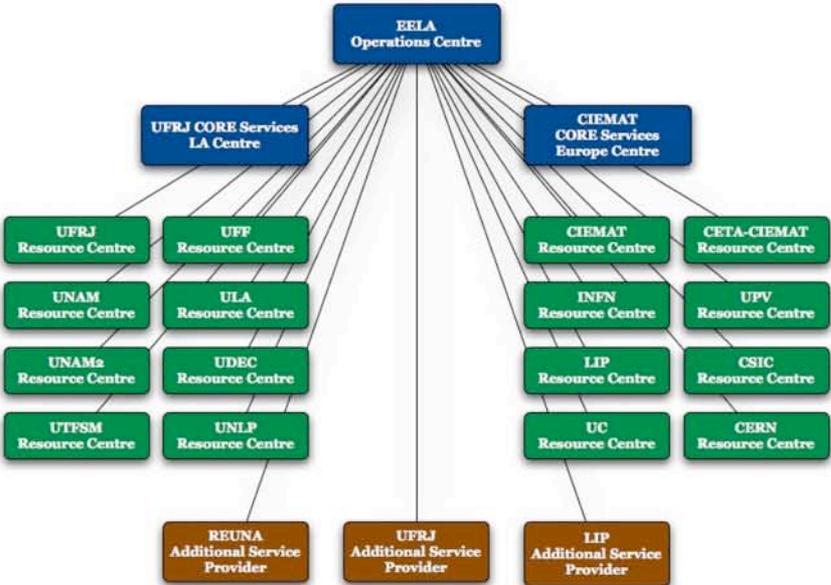
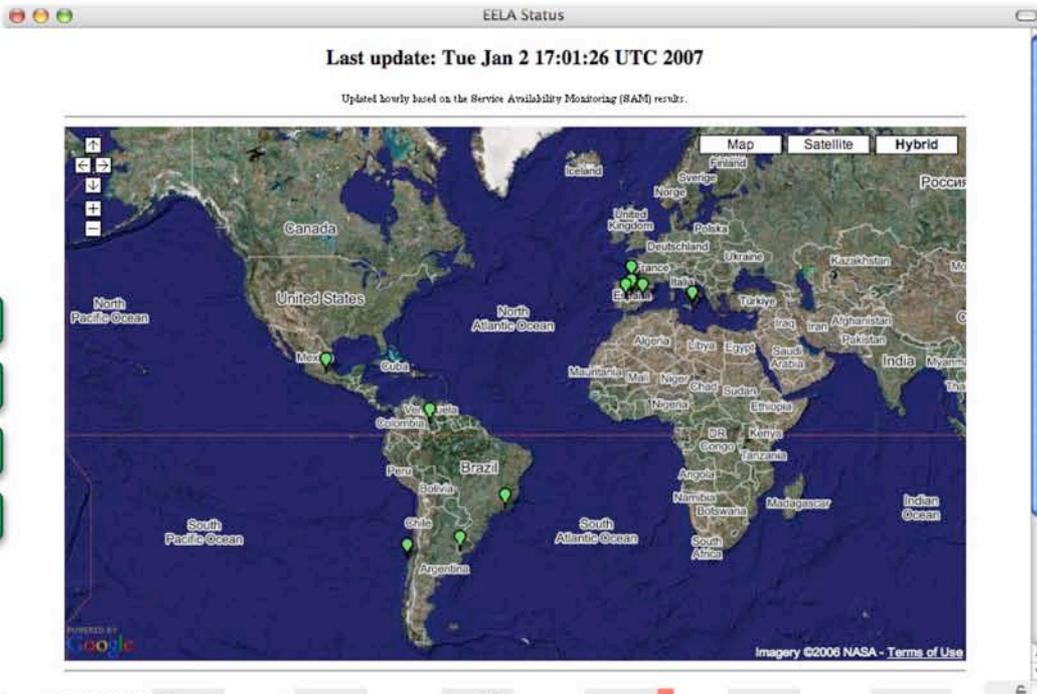
E-infrastructure shared between Europe and Latin America



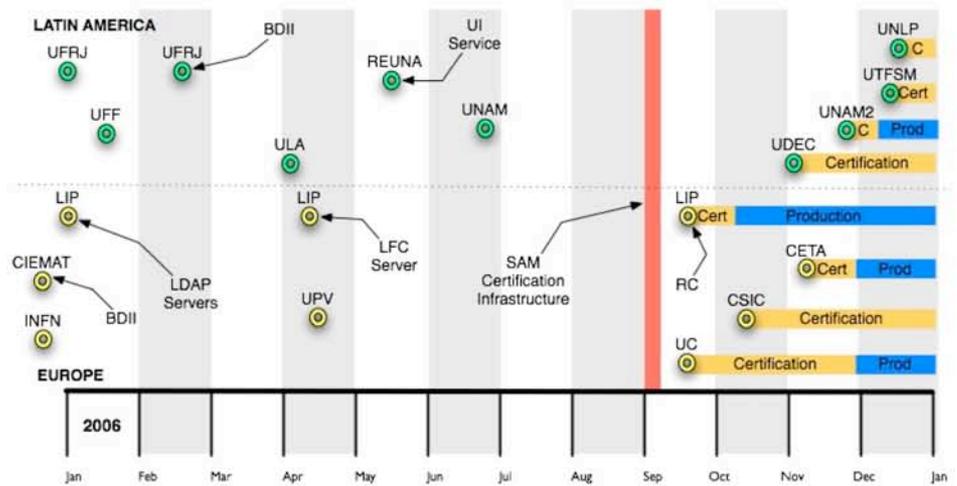


# WORK PACKAGE 2 STATUS

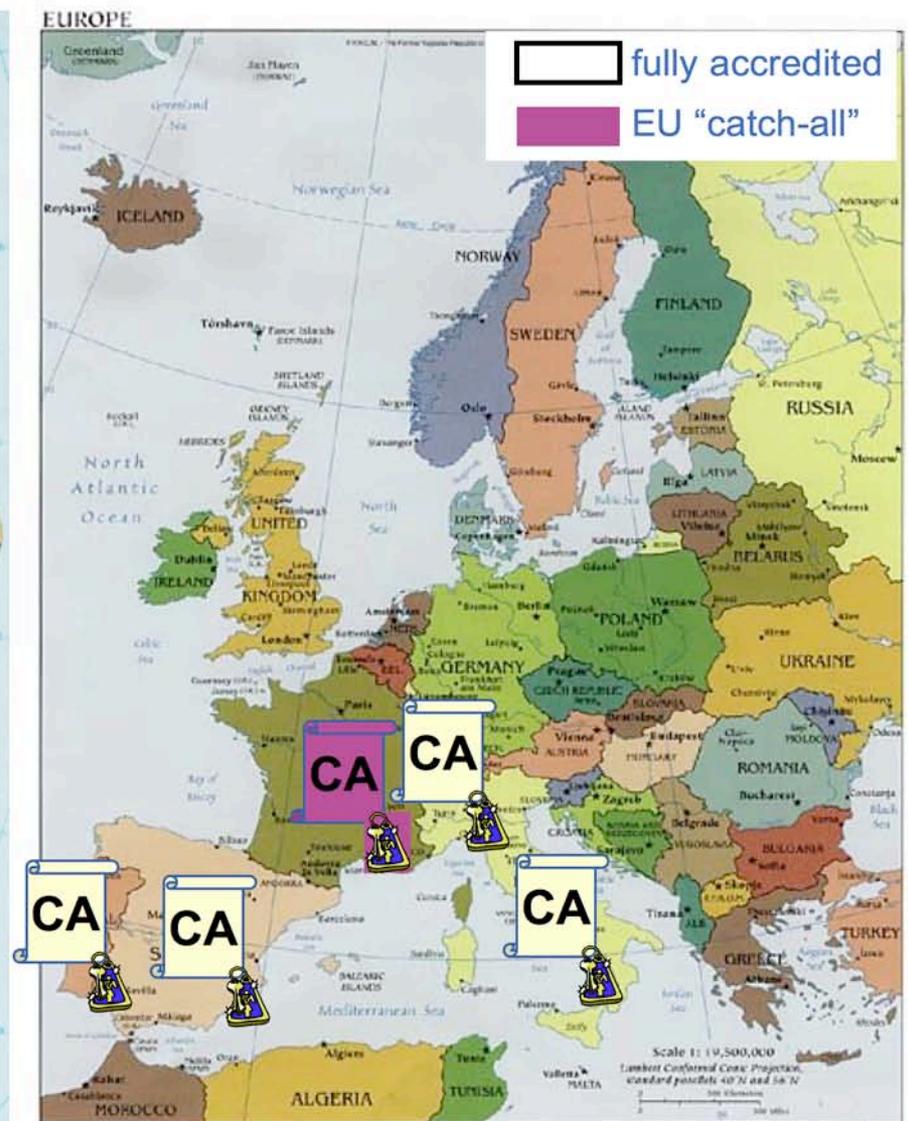
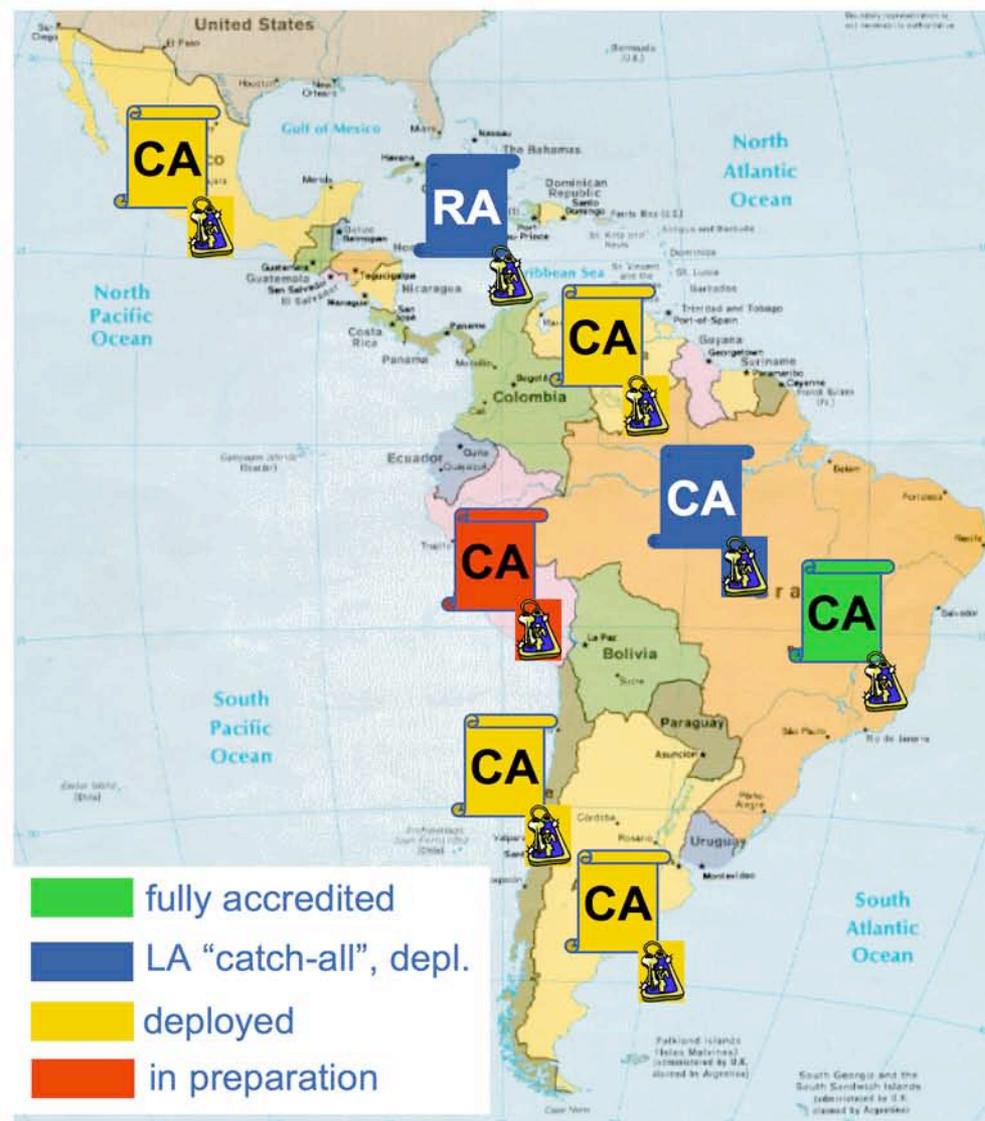
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- >1700 CPUs
- 61.2 TB



E-infrastructure shared between Europe and Latin America



E-infrastructure shared between Europe and Latin America



- **15 TUTORIALS: More than 1200 participants-days delivered so far!**
- **2 GRID schools: Training for “gridification” of new applications to be run on EELA infrastructure**
  - 1st EELA GRID School. – Itacuruçá - Brazil (4 -15 December 2006)
    - 23 participants
    - 7/8 applications gridified
  - 2nd EELA GRID School. Merida - Venezuela (July 30th-August 10th 2007)
    - 21 participants
    - 5/12 applications gridified



# The Applications

## WP3: Identification and support of Grid enhanced applications

- Coordinated by CIEMAT
- Identifies, selects and customizes relevant applications and tools suitable for the Grid dissemination process in:
  - T3.1 Biomedicine (CUBAENERGIA, ULA, UPV)
  - T3.3 Additional Applications
    - *e-Education (CECIERJ/CEDERJ, CIEMAT, CUBAENERGIA, UFRJ, UNAM)*
    - *Climate (UC, UDEC, SENAMHI)*
  - **T3.2 High Energy Physics (CERN, CIEMAT, UFRJ, UNAM, UNLP, UTFSM)**
- Aims at being the place of information exchange between already gridified applications and future ones.

- **Gate**
  - Tumor therapy
- **WISDOM**
  - Wide In Silico Docking On Malaria
- **BiG**
  - Blast in Grid
  - Web portal in ULA (Venezuela)
- **Phylogeny: MrBayes**

- **Video On Demand**
- **LemDist**
  - Remote access to instrumentation and simulation
- **Cuba Grid for Learning (CuGfL)**
- **SATyrus**
  - Automated inference
- **PILP**
  - Inductive logic programming to extract information from structured data

- **Climate**

- New GRID application to predict phenomena relevant for South America: El Niño
  - Novel application in a GRID environment: Join global and local weather models and data mining
  - Use GENIUS to interact with the application

- **Other applications**

- Volcano sonification
  - Use audio patterns to characterize the state of a volcano
  - Long term goal: predict eruptions

## T3.3 Applications have been ported to the Grid during EGRIS-1 Itacuruça (Brazil) 04-16/12/2006

- Besides the anticipated EELA applications, some new applications have been gridified:
  - EMBOSS
  - SegHidro
  - Distributed Simulation of Multiple Failure Events on Optical Networks
  - GENECODIS

- **Initial applications**
  - ALICE
  - LHCb
  
  - Selected because of
    - interest of EELA partners
    - Maturity of the application
  
- **Additional applications**
  - ATLAS
  - CMS
  - Pierre Auger

Study the physics of strongly interacting matter at extreme energy densities, where the formation of a new phase of matter, the quark-gluon plasma, is expected.



- **Three groups**
  - INFN-Catania
  - CIEMAT
  - UNAM
- **Four resource centres set up for ALICE jobs**
  - INFN-Catania
  - CIEMAT Madrid
  - CIEMAT Trujillo
  - UNAM
- **Participating in data challenges**
- **Working on jobs of direct interest to EELA partners**



Usage info

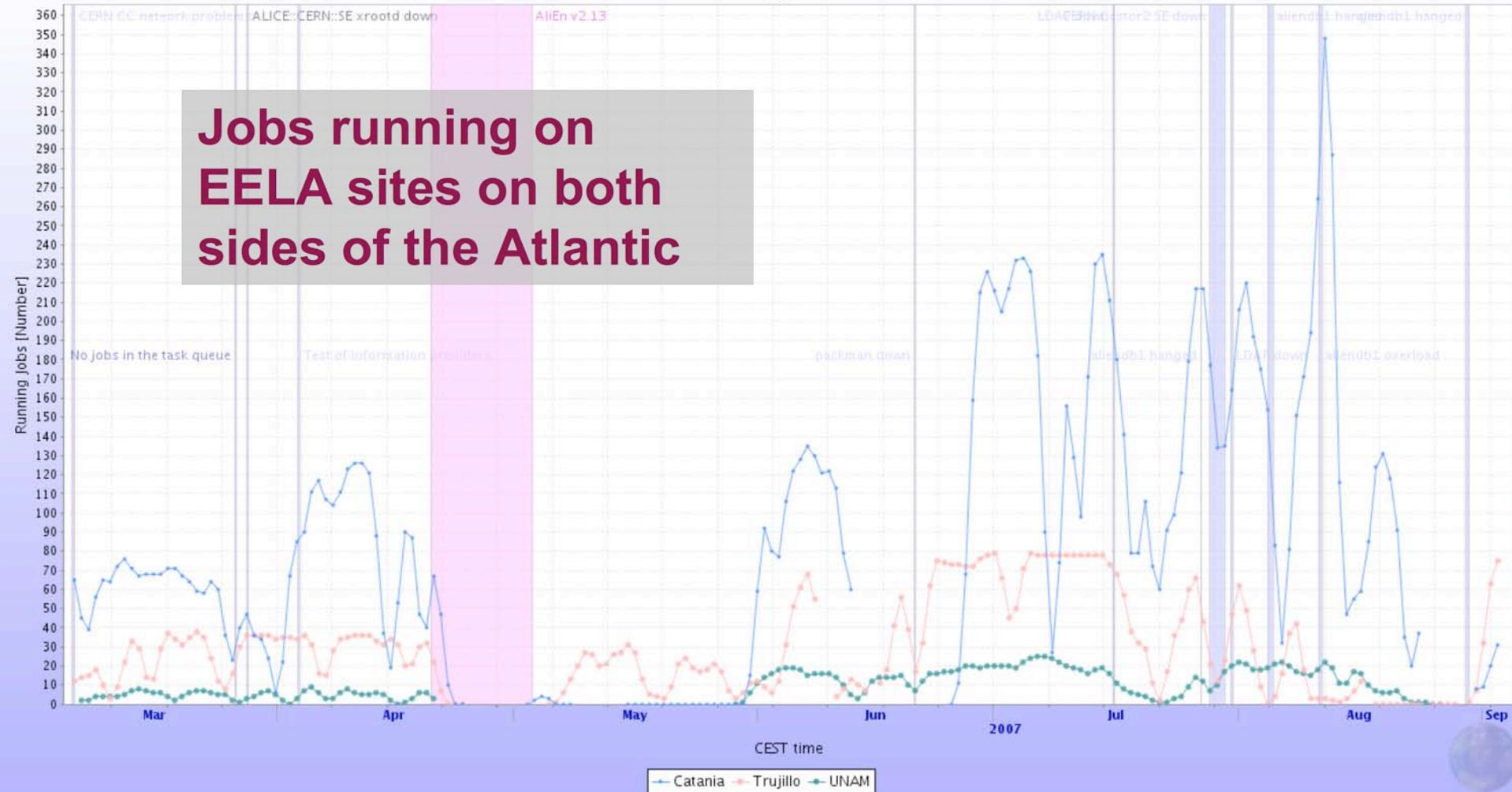
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Run#	PID	Owner	Events	ROOT	ALIROOT	GEANT	Date	Output dir	
		podesta [15]					last year		
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3	1797427	podesta		v5-13-02	v4-04-Rev-08	v1-6-1	25.01.2007 20:06	/alice/cern.ch/user/p/podesta/pp_900GeV/03/	MC simu
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2	1794911	podesta		v5-13-02	v4-04-Rev-08	v1-6-1	25.01.2007 20:06	/alice/cern.ch/user/p/podesta/pp_900GeV/02/	MC simu
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1	1711410	podesta					19.01.2007 03:10	/alice/cern.ch/user/p/podesta/demo/flow/output_nc/001/	test pro
1	1794908	podesta		v5-13-02	v4-04-Rev-08	v1-6-1	25.01.2007 20:06	/alice/cern.ch/user/p/podesta/pp_900GeV/1/	MC simu
	1769912	podesta					23.01.2007 20:37	/alice/cern.ch/user/p/podesta/demo/flow/output_nc/test/	test eve
	1771607	podesta					23.01.2007 21:36	/alice/cern.ch/user/p/podesta/demo/flow/output_nc/test/	test eve
	1771617	podesta					23.01.2007 21:36	/alice/cern.ch/user/p/podesta/demo/	test eve
	1771691	podesta					23.01.2007 23:39	/alice/cern.ch/user/p/podesta/demo/	test eve
<b>TOTAL : 15 jobs</b>			<b>0</b>					<b>Export folders</b>	

**Submission of ALICE  
Grid jobs from Latin  
America**

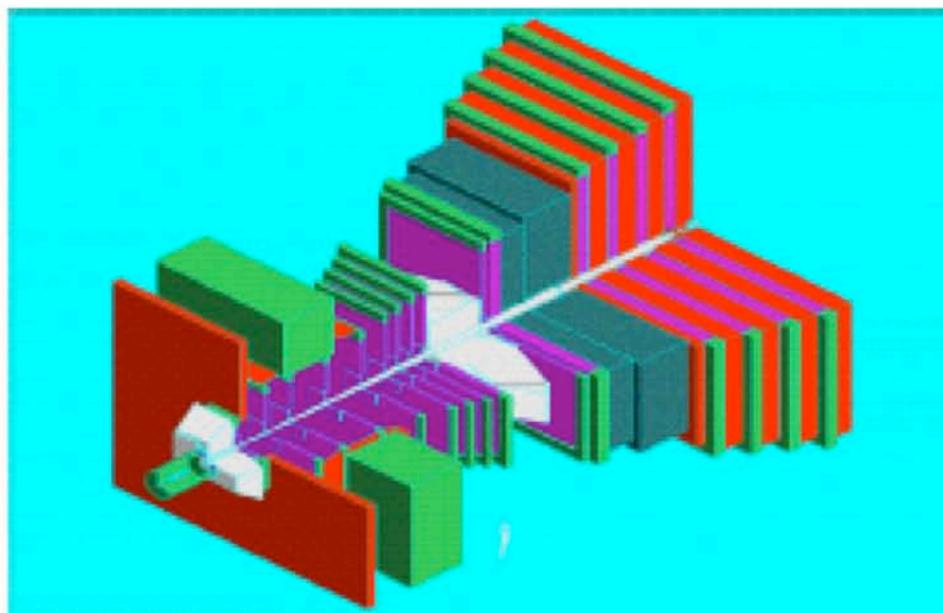


## Running Jobs

**Jobs running on EELA sites on both sides of the Atlantic**

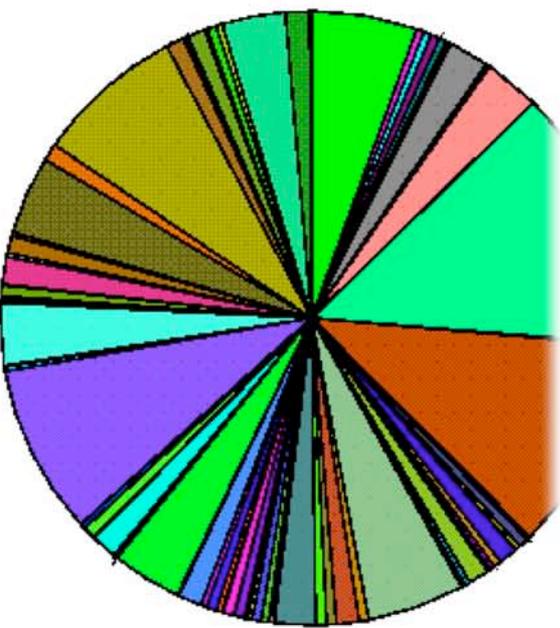


Aims are to fully investigate the CP violation in the Bd and Bs systems, and potentially to discover the new physics beyond the standard model.



- **One group**
  - UFRJ
- **Three resource centers support LHCb**
  - INFN-Catania
  - CIEMAT
  - UFRJ
- **Sites undergoing EGEE certification as required by LHCb**
- **In Data Challenge: Package of 500 events every 20h, 0.5Gb in size, negligible impact on network.**

CPU time 15773343 h



DIRAC.LHCBONLINE.ch	0.00%
DIRAC.Lyon.fr	5.49%
DIRAC.NIPNE.ro	0.00%
DIRAC.UCD.ie	0.00%
DIRAC.Zurich-MH.ch	0.38%
DIRAC.Zurich.ch	0.41%
DIRAC.joel.ch	0.00%
LCG.ACAD.bg	0.47%
LCG.AUVER.fr	0.36%
LCG.BHAM-HEP.uk	0.15%
LCG.BIFI.es	0.11%
LCG.Barcelona.es	2.13%
LCG.Bari.it	0.19%
LCG.Bologna.it	0.01%
LCG.Brunel.uk	2.93%
LCG.CERN.ch	13.67%
LCG.CESGA.es	0.00%
LCG.CGG.fr	0.04%
LCG.CNAF-GRIDIT.it	0.06%
LCG.CNAF.it	11.21%
LCG.CNB.es	0.20%
LCG.CPPM.fr	0.52%
LCG.CSCS.ch	0.26%
LCG.CY01.cy	0.03%
LCG.Cagliari.it	0.00%
LCG.Cambridge.uk	0.00%
LCG.Catania.it	0.01%
LCG.Dortmund.de	0.98%
LCG.Durham.uk	0.40%
LCG.EELA-CIEMAT.es	0.25%
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LCG.ETF-RTH.lv	0.11%
LCG.Edinburgh.uk	0.06%
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LCG.FORTH.gr	1.06%
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LCG.GOG.sg	0.05%
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LCG.INR.ru	0.22%
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LCG.IRB.hr	0.10%
LCG.ITEP.ru	0.51%
LCG.ITWM.de	0.03%
LCG.Imperial.uk	0.55%
LCG.Iowa.us	0.00%
LCG.JINR.ru	0.09%
LCG.KFKI.hu	0.29%
LCG.KIAE.ru	0.52%
LCG.KIAM.ru	0.31%
LCG.Krakow.pl	1.22%
LCG.LAL.fr	0.08%
LCG.LAPP.fr	0.01%
LCG.LISA.nl	0.00%
LCG.LPC.fr	3.64%
LCG.LPN-fails.fr	0.03%
LCG.LPN.fr	0.19%
LCG.Lancashire.uk	1.34%

LCG.LeSC.uk	0.04%
LCG.Legnaro.it	0.66%
LCG.Liverpool.uk	0.29%
LCG.Manchester.uk	8.93%
LCG.Milano.it	0.24%
LCG.NCP.pk	0.01%
LCG.NCU.tw	0.01%
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LCG.OU.il	0.06%
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LCG.PAKGRID.pk	0.00%
LCG.PDC.se	0.06%
LCG.PIC.es	1.43%
LCG.PNPI.ru	0.21%
LCG.Padova.it	0.90%
LCG.Pisa.it	0.20%
LCG.QMUL.uk	4.11%
LCG.RAL-HEP.uk	0.91%
LCG.RAL.uk	7.75%
LCG.RHUL.uk	0.94%
LCG.SARA.nl	0.11%
LCG.SINP.ru	0.16%
LCG.SRCE.hr	0.00%
LCG.Sheffield.uk	0.90%
LCG.Sofia.bg	0.02%
LCG.TAU.il	0.10%
LCG.TCD.ie	0.02%
LCG.Torino.it	0.49%
LCG.UCL-CCC.uk	0.00%
LCG.ULAKBIM.tr	0.32%
LCG.USC.es	3.30%
LCG.WARSAW.pl	1.25%
LCG.WCSS.pl	0.04%
LCG.WEIZMANN.il	0.05%

- **CIEMAT already established**
- **UNLP has recently joined the ATLAS collaboration**
- **UTFSM has started to collaborate with ATLAS**
- **UFRJ ATLAS group expressed interest in using the EELA infrastructure**
  
- **UNLP is requesting funding for a resource centre for ATLAS production**
  - To be shared with EELA
- **UTFSM is in the process of setting up a resources centre**

<http://atlas.web.cern.ch/Atlas/index.html>

- **CMS is the only LHC experiment without participation from a Latin American EELA partner**
- **CMS groups in EELA member countries**
  - Brasil
  - Mexico
  - Spain (CIEMAT)
- **CMS uses the same network as EELA**
- **We have to start to talk with CMS**
  - LA groups have connection to Fermilab
  - Use OpenScienceGrid, not EGEE middleware

<http://cms.cern.ch/>



- **Four EELA partners**
  - Catania
  - UFRJ
  - UNAM
  - UNLP
- **Located in Malargüe, Mendoza, Argentina**
- **Application running already on EGEE**
- **AugerAccess project funded by EU**  
**Data transfer uses LA network infrastructure**
  - Explore benefits from switching to GRID tools
  - SRB based solution under development

<http://www.auger.org/>

**EELA web page:**

**<http://www.eu-eela.org/>**

**WP3 web page:**

**[http://www.eu-eela.org/eela\\_wp3.php](http://www.eu-eela.org/eela_wp3.php)**

**EELA documents:**

**<http://documents.eu-eela.org/>**

## WP3 contacts

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- **EELA finishing at the end of 2007**
  - 3rd EELA conference, December 3-5, Catania  
<http://indico.eu-eela.org/conferenceDisplay.py?confId=96>
  - Other events: see  
<http://indico.eu-eela.org/>
- **Proposal for EELA-2 under preparation**
- **Infrastructure moving to production quality**
- **ALICE (America Latina Interconectada Con Europa) finishes at the end of March 2007.**
- **RedCLARA will continue.**