



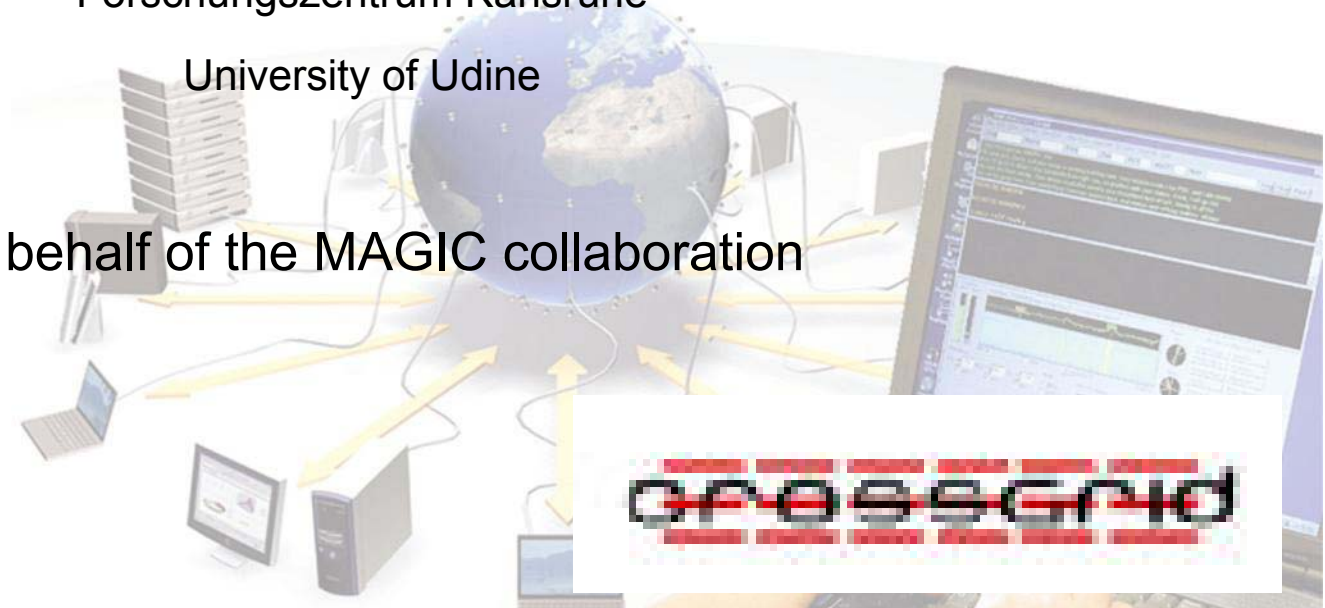
The MAGIC telescope and the Grid

Harald Kornmayer, Alberto Forti

Forschungszentrum Karlsruhe

University of Udine

On behalf of the MAGIC collaboration





Outline

- First demo → Harald
- MAGIC
- Use Cases & Demonstration
- MAGIC and GILDA – Roberto
- MAGIC at CrossGrid
- Plans

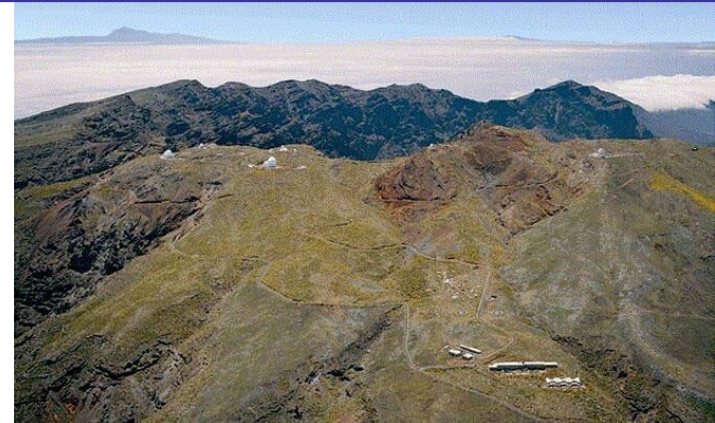


MAGIC Telescope

- Ground based
Air Cerenkov Telescope
- LaPalma,
Canary Islands
(28° North, 18° West)
- 17 m diameter
- operation since autumn 2003
(still in commissioning)
- Collaborators:



*IFAE Barcelona, UAB Barcelona, Humboldt U.
Berlin, UC Davis, U. Lodz, UC Madrid, MPI
München, INFN / U. Padova, U. Potchefstroom,
INFN / U. Siena, Tuorla Observatory, INFN / U.
Udine, U. Würzburg, Yerevan Physics Inst., ETH
Zürich*



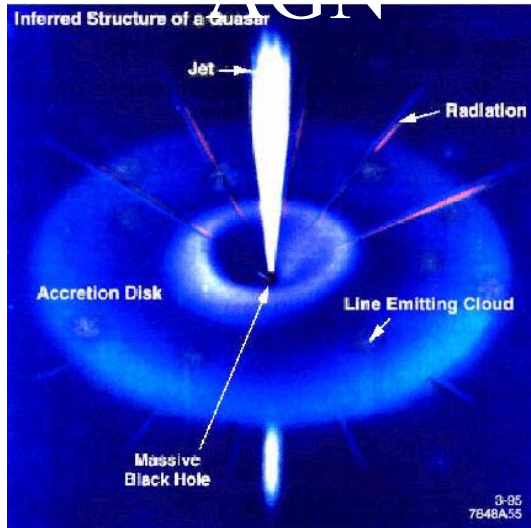


MAGIC – physics goals

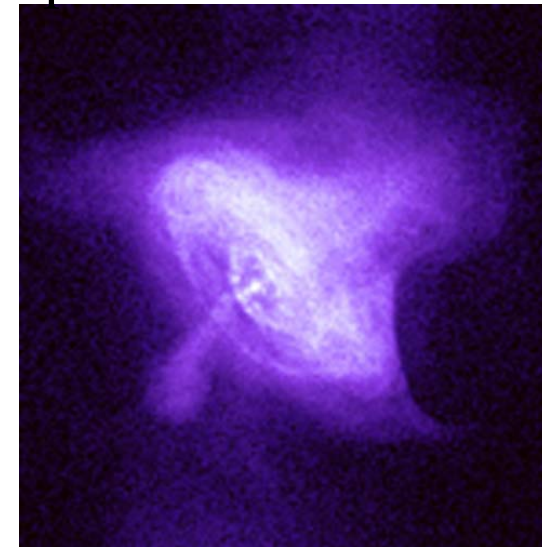
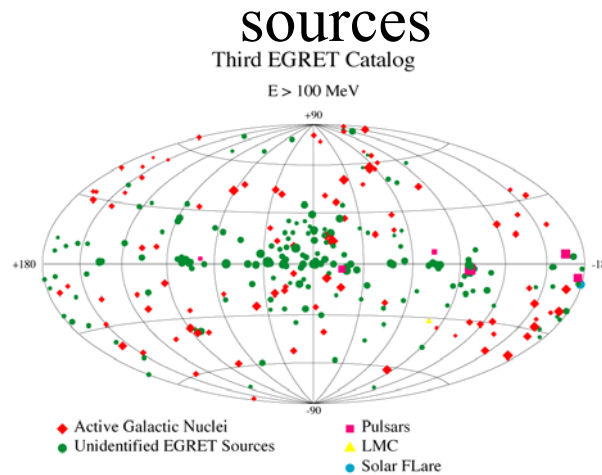
Active Galactic Nuclei

Unidentified EGRET

Supernova Remnants

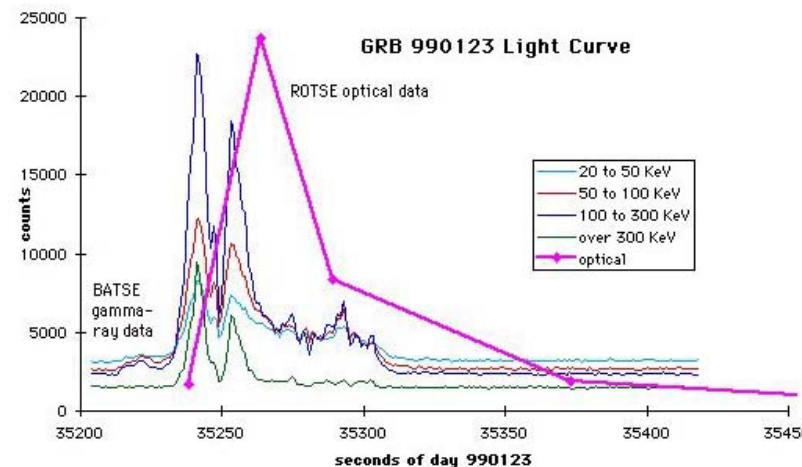


(Mkn 501, Mkn 421)



Crab nebular by Chandra

Gamma
Ray
Bursts



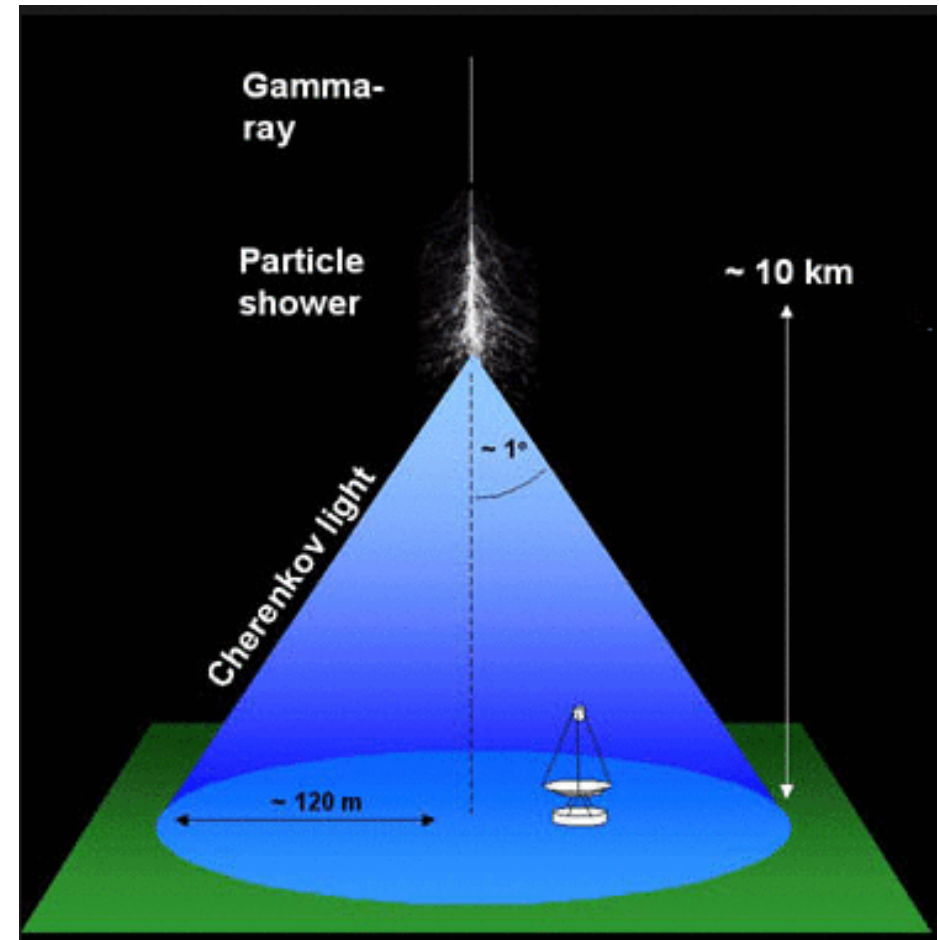
MAGIC – ground based γ -ray astronomy

Gamma ray flux is low

→ huge collection area is required

→ only ground based observations possible

1. Primary particle creates an extensive air shower
2. Secondary particles produce Cherenkov light
3. Telescope collects the Cherenkov light to the focal plan
4. The camera system DAQ records the showers



The cosmic rays consist mainly of hadronic primaries.
A gamma/hadron separation based on MC simulations is needed.



MAGIC – Monte Carlo Simulation

- Based on the air shower simulation program CORSIKA
- Simulation of hadronic background is very CPU consuming
 - to simulate the background of one night, 70 CPUs (P4 2GHz) needs to run 19200 days
 - to simulate the gamma events of one night for a Crab like source takes 288 days.
 - The detector/atmosphere is volatile.
- Only with a coordinated effort can help to connect distributed resources

→ MAGIC Grid



Simulation – first test on GILDA

- The GILDA testbed can be used to get experience on the GRID middleware
- NA4 implemented a webportal for MAGIC to submit one simulation on the GILDA testbed.
- The MMCS software was packed in a rpm to deploy it on the GILDA testbed
- → demo

MMCS use cases

User want to run and control simulations

-Driven by three use cases

- Submit jobs
- Monitor jobs
- Manage data

-Easy to use GUI

- Hide LCG commands
- Java swing GUI

-Job Monitoring and
Data Management based
on a dedicated database

The screenshot shows a Java Swing GUI window titled "Mmcs Grid Access". It has three tabs: "MMCS submission", "Monitoring", and "Data management". The "Monitoring" tab is selected. The GUI is organized into several sections:

- General:** "Number of Showers" is a dropdown menu set to "5". "Particle Type" is a dropdown menu set to "Gamma".
- Energy:** "Spectra Slope" is a text input field with "-2.7". "Min Energy (GeV)" is a text input field with "10". "Max Energy (GeV)" is a text input field with "30000".
- Direction:** "Theta" is a text input field with "0". "Phi" is a text input field with "0". "ConeAngle" is a text input field with "5".
- Impact:** "Radius max (in meters)" is a text input field with "300".
- Control:** At the bottom, there are two buttons: "Reset" and "Submit".

MMCS use cases

User want to run and control simulations

-Driven by three use cases

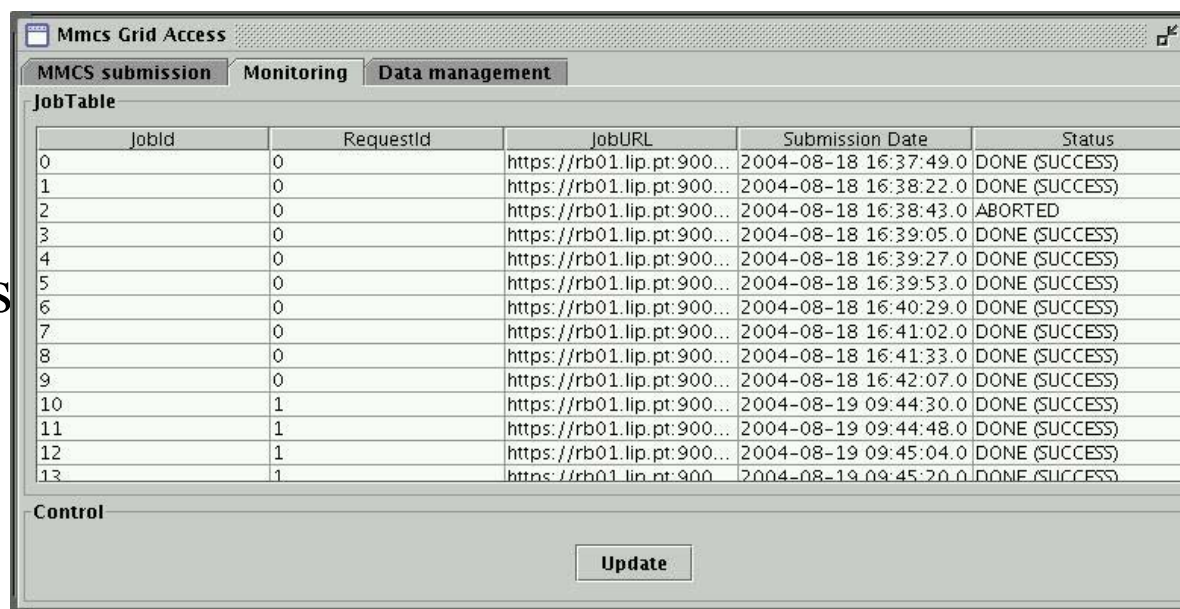
- Submit jobs
- Monitor jobs
- Manage data

-Easy to use GUI

-Hide LCG commands

-Java swing GUI

-Job Monitoring and Data Management based on a dedicated database



The screenshot shows a Java Swing window titled "Mmcs Grid Access" with three tabs: "MMCS submission", "Monitoring", and "Data management". The "Monitoring" tab is active, displaying a table with the following data:

JobId	RequestId	JobURL	Submission Date	Status
0	0	https://rb01.lip.pt:900...	2004-08-18 16:37:49.0	DONE (SUCCESS)
1	0	https://rb01.lip.pt:900...	2004-08-18 16:38:22.0	DONE (SUCCESS)
2	0	https://rb01.lip.pt:900...	2004-08-18 16:38:43.0	ABORTED
3	0	https://rb01.lip.pt:900...	2004-08-18 16:39:05.0	DONE (SUCCESS)
4	0	https://rb01.lip.pt:900...	2004-08-18 16:39:27.0	DONE (SUCCESS)
5	0	https://rb01.lip.pt:900...	2004-08-18 16:39:53.0	DONE (SUCCESS)
6	0	https://rb01.lip.pt:900...	2004-08-18 16:40:29.0	DONE (SUCCESS)
7	0	https://rb01.lip.pt:900...	2004-08-18 16:41:02.0	DONE (SUCCESS)
8	0	https://rb01.lip.pt:900...	2004-08-18 16:41:33.0	DONE (SUCCESS)
9	0	https://rb01.lip.pt:900...	2004-08-18 16:42:07.0	DONE (SUCCESS)
10	1	https://rb01.lip.pt:900...	2004-08-19 09:44:30.0	DONE (SUCCESS)
11	1	https://rb01.lip.pt:900...	2004-08-19 09:44:48.0	DONE (SUCCESS)
12	1	https://rb01.lip.pt:900...	2004-08-19 09:45:04.0	DONE (SUCCESS)
13	1	https://rb01.lip.pt:900...	2004-08-19 09:45:20.0	DONE (SUCCESS)

Below the table is a "Control" section with an "Update" button.

MMCS use cases

User want to run and control simulations

-Driven by three use cases

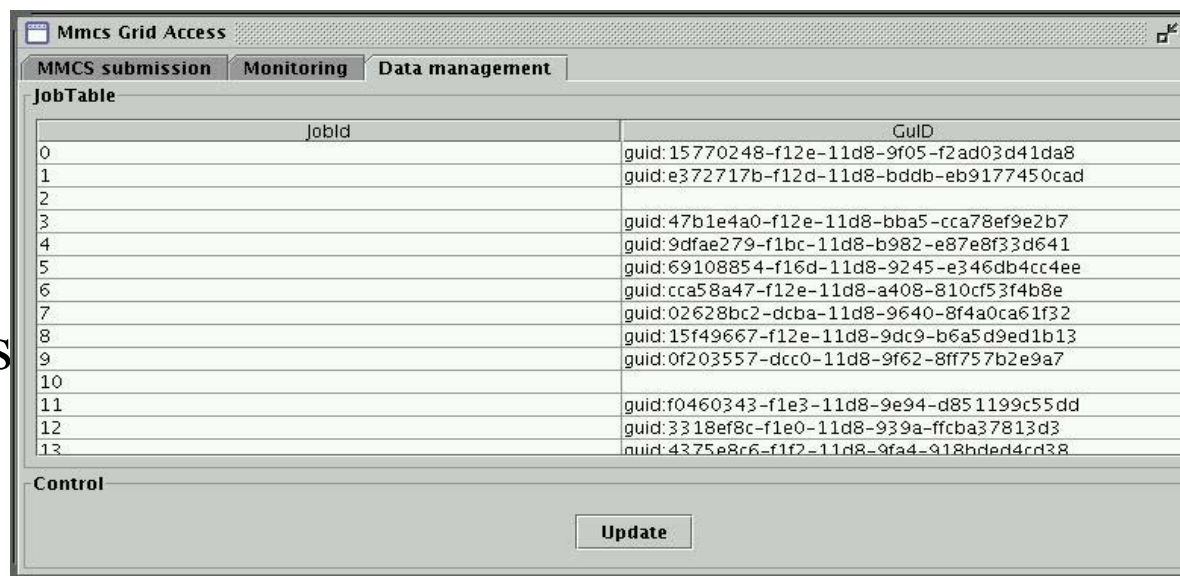
- Submit jobs
- Monitor jobs
- Manage data

-Easy to use GUI

-Hide LCG commands

-Java swing GUI

-Job Monitoring and Data Management based on a dedicated database



The screenshot shows a Java Swing window titled "Mmcs Grid Access" with three tabs: "MMCS submission", "Monitoring", and "Data management". The "Monitoring" tab is active, displaying a table with two columns: "JobId" and "GUID". The table contains 14 rows of data. Below the table is a "Control" section with an "Update" button.

JobId	GUID
0	guid:15770248-f12e-11d8-9f05-f2ad03d41da8
1	guid:e372717b-f12d-11d8-bddb-eb9177450cad
2	
3	guid:47b1e4a0-f12e-11d8-bba5-cca78ef9e2b7
4	guid:9dfae279-f1bc-11d8-b982-e87e8f33d641
5	guid:69108854-f16d-11d8-9245-e346db4cc4ee
6	guid:cca58a47-f12e-11d8-a408-810cf53f4b8e
7	guid:02628bc2-dcba-11d8-9640-8f4a0ca61f32
8	guid:15f49667-f12e-11d8-9dc9-b6a5d9ed1b13
9	guid:0f203557-dcc0-11d8-9f62-8ff757b2e9a7
10	
11	guid:f0460343-f1e3-11d8-9e94-d851199c55dd
12	guid:3318ef8c-f1e0-11d8-939a-ffcba37813d3
13	guid:4375e8c6-f1f2-11d8-9fa4-918bdeed4cd38

MMCS use cases

User want to run and control simulations

-Driven by three use cases

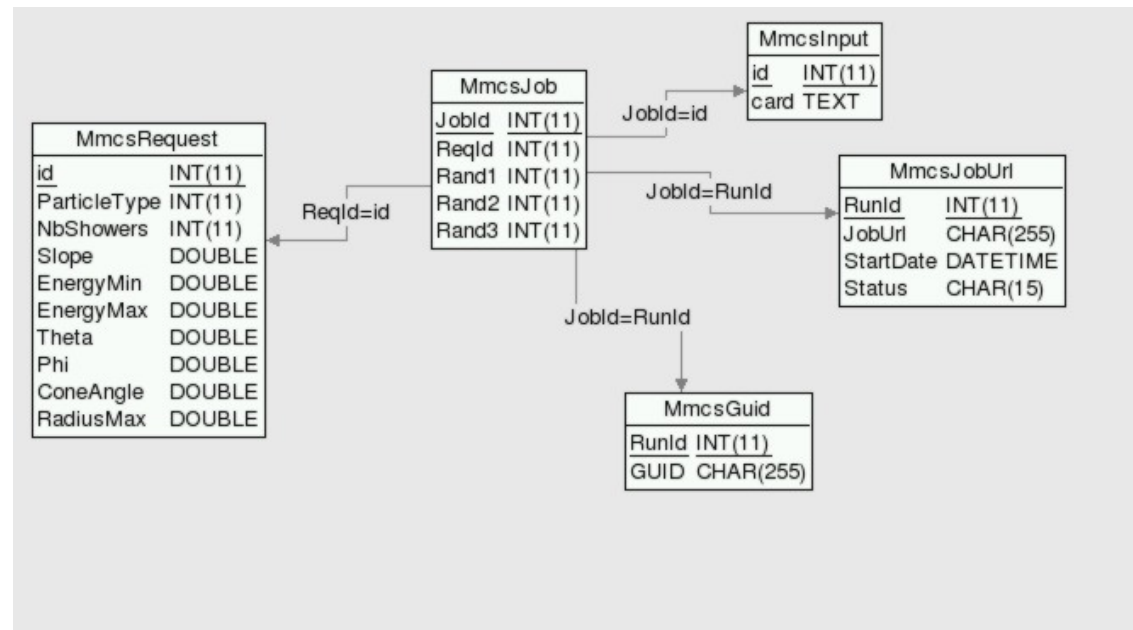
- Submit jobs
- Monitor jobs
- Manage data

-Easy to use GUI

-Hide LCG commands

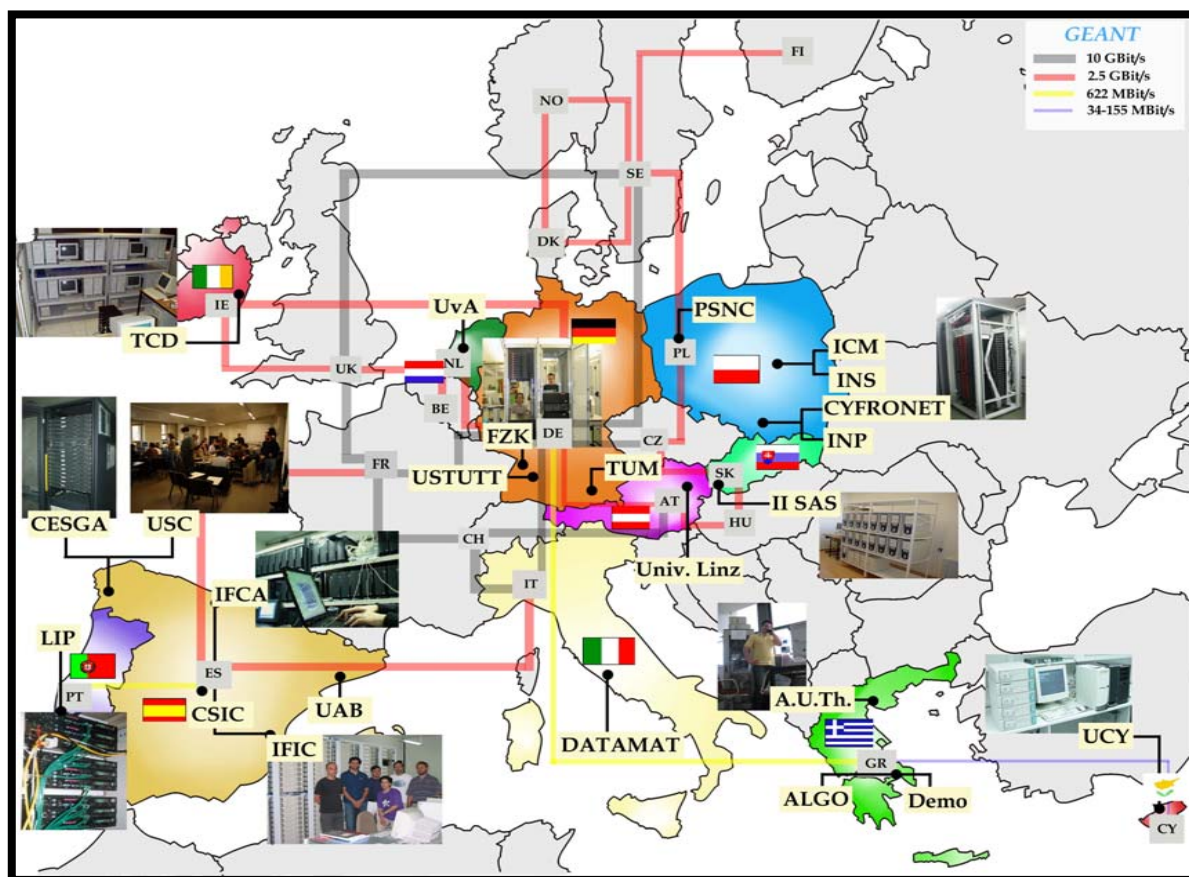
-Java swing GUI

-Job Monitoring and
Data Management based
on a dedicated database



MAGIC @ CrossGrid

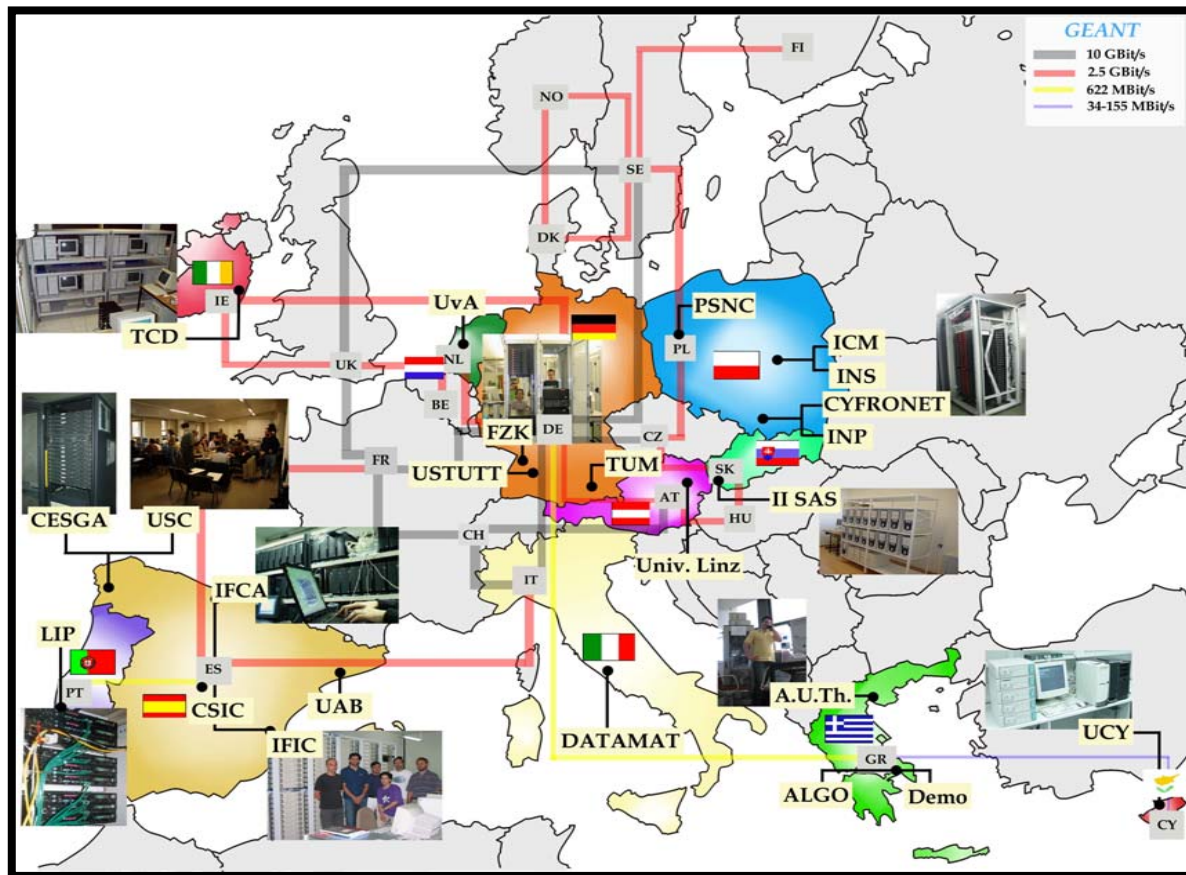
- LCG-2 testbed with extensions from CrossGrid
- 16 sites in Europe





MAGIC @ CrossGrid

- LCG-2 testbed with extensions from CrossGrid
- 16 sites in Europe



The first prototype for a MC production system for the MAGIC telescope exists

→ A europeanwide system will be setup together with CNAF, PIC and GridKA



The plans for the future

- A magic Virtual Organisation already exists
 - VO server is hosted by SARA/NIKHEF
- CNAF will support the magic VO with a Resource Broker
- PIC will support the magic VO with storage and the RLS
- CNAF, PIC and GridKA will provide CPU cycles
- GILDA can be used for the first test too
- Others sides can join the MC data challenge Feb 2005
 - (hopefully)
- Usage of the CrossGrid Migrating Desktop/Roaming Access Server to provide a user friendly GUI for potential Grid Users



Acknowledgement

- Thanks to
 - CNAF, PIC and GridKA for supporting this idea
 - SARA/NIHKEF for hosting the VO service
 - CrossGrid for the usage of the testbed and the migrating desktop
 - The GILDA testbed team for their support (esp. Roberto Barbera)
 - The MAGIC collaborators for supporting this effort
 - EGEE for accepting the MAGIC Grid proposal
 - EGEE for offering a lot of resource in the data challenge in Feb 2005