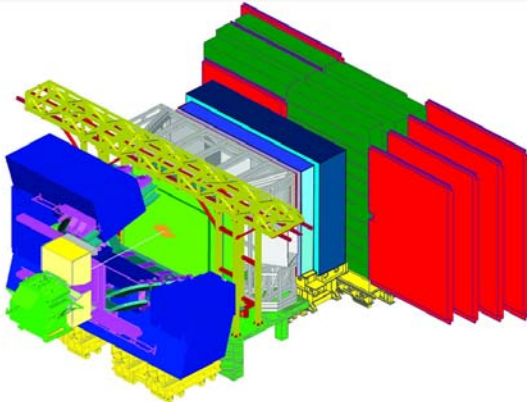




LHCb Grid Computing

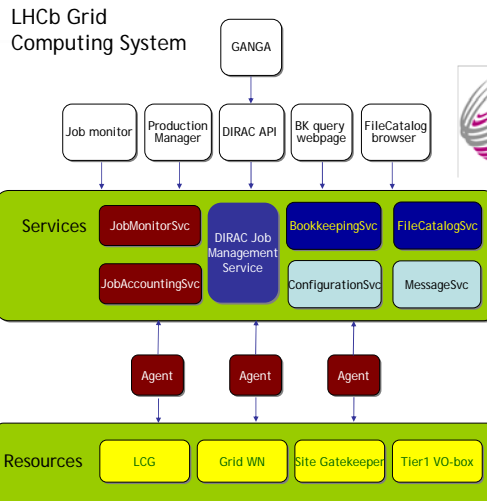


LHCb is a particle physics experiment which will study the subtle differences between **matter** and **antimatter**. The international collaboration consists of:

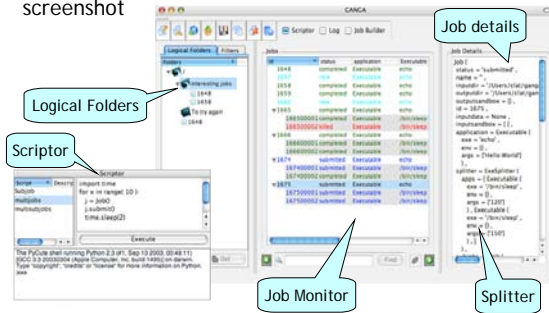
- 657 scientists
- 46 institutes
- 13 countries



1000 million short lived particles of **matter** and **antimatter** called B and B-bar mesons (which contain the b quark) will be studied each year. In order to design the detector and to understand the physics, many millions of simulated events also have to be produced. To do this LHCb designed the **DIRAC** system to allow the utilisation of computing resources distributed around the world. **DIRAC** allows LHCb computing jobs to be processed on dedicated LHCb resources as well as underlying **GRID** systems such as the **LCG**. In addition to the development of **DIRAC**, **GRIDPP** supports work on the metadata service and the **Ganga** Grid interface, a joint LHCb/ATLAS project.



Ganga GUI screenshot

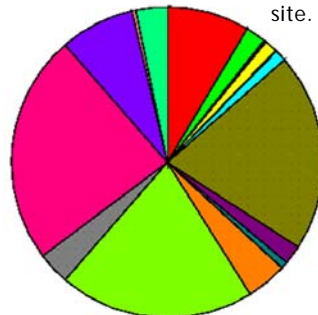


Jobs run using the **DIRAC** system publish accounting information for resources used across the GRID. For the year period between April 2005 and April 2006 **UK resources** made up **36% of the total CPU** used by LHCb corresponding to **2.3M CPU hours** (~262 machines running for the entire year). This allowed LHCb to produce **39.1M events** generating **28.5TB** of output data in the UK.



CPU time 2346932 h

UK LHCb resource usage by site.



DIRAC.ScotGrid.uk	8.56%
LCG.BHAM-HEP.uk	2.09%
LCG.Cambridge.uk	0.25%
LCG.Durham.uk	1.32%
LCG.Edinburgh.uk	0.10%
LCG.Imperial.uk	1.22%
LCG.Lancashire.uk	20.61%
LCG.Liverpool.uk	1.98%
LCG.Manchester.uk	0.73%
LCG.Oxford.uk	4.23%
LCG.QMUL.uk	20.29%
LCG.RAL-HEP.uk	3.36%
LCG.RAL.uk	23.89%
LCG.RHUL.uk	7.72%
LCG.Sheffield.uk	0.41%
LCG.UCL-CCC.uk	3.25%

©2006-04-03 Between 2005-04-02 - 2006-04-02

LHCb utilises computing resources provided to **LCG** by UK sites. In the previous year these resources were broken down between **15 LCG sites**. In addition, **ScotGRID** provides dedicated resources for **DIRAC**. A breakdown of CPU used within the UK is given in the chart opposite.

