Mont-Blanc highlighted at ISC’12
During the ISC’12 Mateo Valero and Alex Ramirez were invited to hold two sessions. They took the opportunity to give further details about the latest results in Mont-Blanc.

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Mateo’12 brings the best computer architects to Barcelona
The event, whose title pays homage to Mateo Valero, brought together well-known players in this field.

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The sequencing of the tomato genome
BSC was involved in genome assembly making massive use of in house programs and shared memory machines. Nature has published the article.

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A European platform for HPC
Industry and Research Centres create the European Technology Platform to strengthen European competitiveness in the area of High Performance Computing.

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A 3D Virtual Heart
BSC is currently working on a 3D heart simulation. Doctors from the Hospital de Sant Pau and scientists from the CVC are participating in the project.

More information on page 4

‘CALIOPE: much more than just a project about air quality’ By José Mª Baldasano, Earth Sciences department director
It is also very specifically a computational project about code development, communications, database management, visualisation tools, and website management.

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Directors’ View

It is a pleasure for us to be writing the introduction to this, the first edition of the BSC’s newsletter. The newsletter aims to inform BSC staff on what is going on at the centre and to complement the BSC’s other channels such as our website, intranet and social media platforms (facebook, youtube and twitter). We are looking forward to your active participation in this new instrument.

BSC has achieved a lot in its short lifetime thanks to the talent and hard work of all of you and the support of our patrons. These achievements have been recognised in many forms including competitive projects, contracts with companies and the recent Severo Ochoa award. This success has led to fast growth and has meant that in some cases the tools and processes necessary for this larger organisation need to be refined. The first BSC Scientific Advisory Board was held this year and was an opportunity for us to take stock. BSC received an excellent report from an external committee of renowned experts as well as recommendations allowing us to plan improvements and set the centre’s sights even higher.

The upgrade of the MareNostrum this year will also help us to provide a better service to science and industry and will consolidate our place in Europe as the Spanish contribution to the PRACE supercomputing infrastructure. In the first two phases of the upgrade, MareNostrum3 will reach a speed of around one Petaflop, and will support the research of thousands of Spanish and European scientists who are working on solutions to some of the most pressing problems facing the world today.

We are all aware that the current economic context is not an easy one, but we are confident that the hard work and enthusiasm of the BSC team will allow us to continue to fulfill our mission and consolidate our prestige and our reputation as a world-class organisation.

Mateo Valero, the BSC director and Francesc Subirada, the BSC associate director

Calendar of Events

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<th>Jul</th>
<th>PUMPS Summer School</th>
<th>2 July, 2012 Barcelona</th>
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<tr>
<td>Sept</td>
<td>6th RES User’s Conference and HPC Advisory Council Spain Conference 2012</td>
<td>12 September, 2012 Málaga</td>
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<td>Oct</td>
<td>Slurm: A Highly Scalable Resource Manager</td>
<td>9 October, 2012 Barcelona</td>
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<td>Oct</td>
<td>24th ACCENT/GLOREAM Workshop</td>
<td>17 October, 2012 Barcelona</td>
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<tr>
<td>Oct</td>
<td>1st EUDAT Conference</td>
<td>22 October, 2012 Barcelona</td>
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<tr>
<td>Nov</td>
<td>II Lectures on atmospheric mineral dust</td>
<td>5 November, 2012 Barcelona</td>
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<tr>
<td>Nov</td>
<td>SC2012: Supercomputing Conference 2012</td>
<td>10 November, 2012 Salt Lake City</td>
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Mont-Blanc highlighted at ISC’12

During the International Supercomputing Conference 2012 (ISC’12) held from 17th – 21st of June 2012 in Hamburg (Germany), Mateo Valero, the BSC director, and Alex Ramirez, Mont-Blanc project coordinator, were invited to hold two sessions promoting this European project. They took the opportunity to give further details about the latest results in Mont-Blanc that is now one of the key topics among the HPC community.

Coordinated by BSC, the Mont-Blanc project brings together a purely European consortium gathering industrial technology providers and supercomputing research centres, with a total budget of over 14 million Euros. Its main objective is to design a new type of computer architecture capable of setting future global HPC standards that will deliver Exascale performance while using 15 to 30 times less energy that today's energy efficiency leaders. With energy efficiency being a key issue, the system architecture will rely on energy-efficient ARM processors, also used in embedded and mobile devices. The first Mont-Blanc prototype, in 2014, is expected to achieve from 4 to 10 times increase in energy-efficiency compared with current technologies.

Web: www.montblanc-project.eu
Twitter: @MontBlanc_EU Facebook: www.facebook.com/MontBlancEU

Mateo’12 brings the best computer architects to Barcelona

On 28 and 29 June, some of the top researchers in computer architecture converged in Barcelona to participate at Mateo 2012: Multicore Architectures and Their Effective Operation Workshop. The event, whose title pays homage to Mateo Valero, the BSC director, brought together well-known players in this field, including six winners of the prestigious Eckert Mauchly award (popularly known as the Nobel for computer architecture) and four Maurice Wilkes award winners, equivalent to the Eckert Muchly but for young researchers. These distinguished researchers and industry representatives in the field of computer sciences have in some way collaborated or have been in contact with UPC and the FIB’s Computer Architecture department, the former CEPBA and BSC. Conference sessions centred on topics such as computer microarchitecture, multicore programming, heterogeneous computing, compilers and programming models. Mateo 2012 was organised by BSC, with the collaboration of the UPC and the European network HiPEAC.

More information on the website
News

The sequencing of the tomato genome

The Tomato Genome Consortium has sequenced and assembled the genomic DNA of this fruit species, specifically of a domesticated variety, Heinz 1706. Scientists from several European centres, including Modesto Orozco, David Torrents and Xavier Pastor, researchers from the joint programme between BSC and IRB Barcelona have joined forces to obtain the sequence of this fruit. The sequence, as well as the results of its analysis, has been published in the journal Nature. For this study, the tomato genome was compared with several closely related species. These comparisons have revealed that the tomato genome has undergone complete duplications during its evolution. These events are extremely relevant from an evolutionary point of view, since they offer an optimum framework for genes affected by these duplications to explore new functions that contribute to the evolution and improvement of the species. BSC was involved in genome assembly making massive use of in house programs and shared memory machines.

More information on the website

European Technology Platform for High Performance Computing

Major suppliers of High Performance Computing (HPC) technologies including in association with HPC research centres, among them BSC, have created a European Technology Platform for HPC (ETP4HPC) and released the ETP’s Vision document to improve Europe’s position in the domain of HPC technologies. The ETP strengthens European competitiveness in the area of HPC, which is a key requirement for future research and innovation as well as addressing a wide range of social and economic challenges.

For more information: www.etp4hpc.eu

A 3D Virtual Heart

BSC is currently working on a 3D heart simulation. This project is framed within the Severo Ochoa excellence programme and the MareNostrum supercomputer is essential here, as the simulation is so highly complex that it necessitates the calculation power of an extraordinarily powerful computer. Mariano Vázquez, CASE researcher, states that "the model can have many uses, including to understand several heart anomalies that are currently treated with drugs, and helping to plan operations."
The MareNostrum was a unique opportunity to bring to fruition scientific and technical developments that had been ready but that could not be executed due to a lack of computational capacity. One of these was the BSC’s CALIOPE project: air quality forecast system for Spain and Europe, which is funded by the Ministry of Environment.

CALIOPE is not only a scientific project about air quality. It is also very specifically a computational project about code development, communications, database management, visualisation tools, website management, etc.

Air pollution affects human health. It is estimated that some 20 million European citizens suffer respiratory and cardiovascular problems. The cost of asthma is estimated at 3 billion euros per year. Asthmatics, particularly children, are highly sensitive to air pollution. The International Agency for Research on Cancer just defined diesel flue gases as carcinogenic.

CALIOPE integrates the WRF-ARW, HERMES, CMAQ and BSC-DREAM8b models. CMAQ is the chemical transport model used; the WRF-ARW model provides meteorological data; emissions are provided by the HERMES model, the contribution of Sahara dust is obtained from the BSC-DREAM8b model. The last two were fully developed at the BSC.

It provides a 48-hour forecast of air quality for the Spain and Europe domains with a horizontal grid resolution of 4 and 12 km2 respectively, and a time resolution of 1 hour. The system calculates the hourly concentration of O3, NOx, CO, SO2, PM10 and PM2.5. It is an essential tool for air quality managers and also so that citizens can know the values of the air quality that they breathe. It contains also an assessment module in Near Real Time, with measurements from 400 air quality stations in Spain and 800 in Europe, as well as 300 weather stations, which are applied to a bias correction by employing a Kalman Filter. The system has been operational since October 2006.

This unique information contributes to understanding atmospheric processes and transport dynamics. To date, the project has published 22 papers and presented at 36 conferences. The most important result of the project has been the creation of the team, with a total of 25 people having worked on the project up to now.
We would like to welcome new staff who have joined the centre in the last few months:

ISAC RUDOMIN Senior Researcher Computer Sciences Dept.
JAIME AGUADO Research Support Engineer CASE Dept.
PAULO RODENAS Technical Support Engineer Operations Dept.

ANNA GUERALT Postdoctoral Researcher Computer Sciences Dept.
DANIEL CASULL Research Support Engineer Computer Sciences Dept.
JANKO STRASSBURG Postdoctoral Researcher Computer Sciences Dept.

VICTOR MANUEL VALCERDE Student researcher Earth Sciences Dept.
ROGER HERNANDEZ Research Support Engineer Computer Sciences Dept.
GUILERMO MARIN Designer for Scientific Visualization CASE Dept.

MARC RABINAL Undergraduate Student Management Dept.
MIGUEL CASTRILLO Research Support Engineer Earth Sciences Dept.
DOLORES GUERRERO Student researcher Earth Sciences Dept.

CARLES HERNANDEZ LIZ Postdoctoral Researcher Computer Sciences Dept.
MARCO VAZ Research Support Engineer Life Sciences Dept.
LAURA BERMUDEZ Web Graphic Designer Operations Dept.

MATIAS AVILA Postdoctoral Researcher CASE Dept.
ROBERT SOLIVA Postdoctoral Researcher Life Sciences Dept.

BSC has created this new position to promote and start up new scientific-academic training initiatives in collaboration with the UPC and other institutions in the academic and business areas.

MARIA RIBERA SANCHO Responsible of BSC Academic Programs

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