Research Opportunities in Spain, Barcelona and at the BSC

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Mateo Valero, Director
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Who is this presentation aimed at?

Researchers with degrees in: …and with expertise in areas such as:

- Computer science,
- Electrical engineering,
- Mathematics
- Physics
- Biochemistry/Biology
- Environmental engineering
- or related areas…
- Parallel programming/Performance tools
- Computer architecture/embedded systems
- Big data/cloud
- Computational mechanics
- Numerical modelling
- Biinformatics and computational genomics
- Air quality and Earth system modelling

We offer: the chance to develop your career in a dynamic, stimulating scientific environment, at one of the world’s leading HPC centres and working with some of the best international organisations in the field.
BSC-CNS objectives:
- **Supercomputing services** and support to Spanish and European researchers
- **R&D** in Computer, Life, Earth and Engineering Sciences

BSC-CNS is a public consortium:
- Spanish Government
- Catalanian Government
- Universitat Politècnica de Catalunya (UPC)

300+ people from 40 countries
(40% staff from abroad)

70+ ongoing research projects with organisations from 43 countries
MareNostrum 3 Supercomputer

$10^{15}$ Floating Point Operations per Second
Nearly 50,000 cores

Ranked 34th fastest in the world
and 11th in Europe (top500 November 2013)
Simulation on Supercomputers helps to resolve scientific and societal challenges

**Environment**
- Climate modelling
- Air quality

**Life Sciences**
- Personalised medicine
- The virtual patient

**Engineering**
- Industrial process improvement
- Virtual prototyping

**Energy**
- Oil exploration
- Wind farm design
- Fusion (ITER)
Mateo Valero - BSC Director

- Full Professor of Computer Architecture Department at UPC, Barcelona
- Main research interest - high performance computing architectures
- published approximately 600 papers
- ERC Advanced Grant “RoMoL” (2013-2018)

- Eckert-Mauchly Award
- Harry Goode Award
- ACM Distinguished service
- 6 honorary doctorates, member of 5 academies
- Fellow of the IEEE, the ACM and an Intel Distinguished Research Fellow.
Mission of BSC Scientific Departments

**COMPUTER SCIENCES**
To influence the way machines are built, programmed and used: programming models, performance tools, Big Data, computer architecture, energy efficiency

**LIFE SCIENCES**
To understand living organisms by means of theoretical and computational methods (molecular modeling, genomics, proteomics)

**EARTH SCIENCES**
To develop and implement state-of-the-art global and regional models for short-term air quality forecast and long-term climate applications

**CASE**
To develop scientific and engineering software to efficiently exploit super-computing capabilities (biomedical, geophysics, atmospheric, energy, social and economic simulations)
Some Key Research Partners
Joint Research with Industry

Joint research centres:
- Microsoft BSC Research Centre
- Intel BSC Exascale Laboratory
- BSC IBM Technology Center for Supercomputing
- BSC CUDA Center of Excellence
- Repsol BSC Research Centre

Some significant contracts:
- IBERDROLA
- eesa (European Space Agency)
- XILINX
- SAMSUNG (Memory Systems for High Performance Computing)
Foreign researchers whose main or sole reason for travelling to Spain is to undertake research projects can apply for the recently created **Scientific Visa** which entitles them and their families to the same benefits as European citizens (health insurance, schools, work permits etc.)
Opportunities by career stage

**Catalan Institution for Research and Advanced Studies** offers **long term senior positions** to work at host centres in Catalonia.

Post doctoral **Marie Curie Fellowship or** a **ERC grant** (for starting grant or advanced, depending on age and experience).

Spanish Ministry of Research and Innovation: offers **fellowships for tenure track** (**Ramon y Cajal**, 5 yrs) or **postdoctoral positions** (**Juan de la Cierva 2** or 3 yrs).

NSF Career Award winners can visit BSC through the **NSF-ERC agreement**.

**La Caixa International** PhD Program Fellowships

Sabaticals from Spanish Education Ministry, Autonomous Catalan Government etc.
Barcelona

- 5th city in the world for quality life according to UN-Habitat’s state of world’s cities 2012-13
- 4th European city with the highest number of published scientific articles and 10th in the world Science Citation Index.
- 12th world city in terms of nº of foreign investment projects
- Strong concentration of Universities and Research Centers, dynamic environment in research and innovation
- High concentration of ERC grants
- Excellent international and local public transport infrastructure (you don't need a car!)
Severo Ochoa Centres of Excellence:
6 of the 13 from Barcelona Area

Awarded by government to centres considered by an international panel to be amongst the most internationally competitive in their fields
Job Opportunities at BSC

Positions financed by BSC-CNS (research grants): post-doctoral positions, **pre-doctoral grants (often)** associated to a PhD positions at UPC) and engineers.

Positions Currently Open at BSC:

- **Human Brain Project**
  - Developer for BigData resource management

- **PRACE**
  - Administrator Unix/Linux Platforms for PRACE

- **EXCELENCIA SEVERO OCHOA**
  - Domain Specific Language Engineer for CDR equations

- **MONT BLANC**
  - Postdoc to work on resilient exascale software
  - Support Engineer, cluster prototype construction and evaluation
Thank you!

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