The Barcelona Supercomputing Center
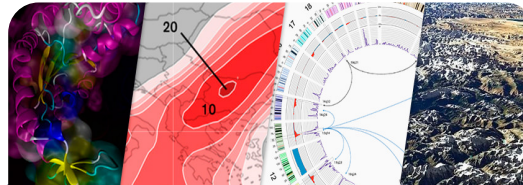
Nadia Tonello

BSC Data manager

27/11/2018

Grupos de Trabajo de RedIRIS sobre el impacto en las TICs de la ciencia abierta, Ciudad Real

Barcelona Supercomputing Center
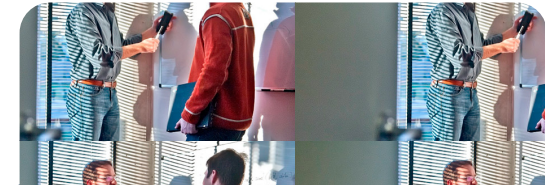# Centro Nacional de Supercomputación

BSC-CNS objectives

Supercomputing services to Spanish and EU researchers

R&D in Computer, Life, Earth and Engineering Sciences

PhD program, technology transfer, public engagement

BSC-CNS is a consortium that includes

Spanish Government	60%	
Catalan Government	30%	
Univ. Politècnica de Catalunya (UPC)	10%	

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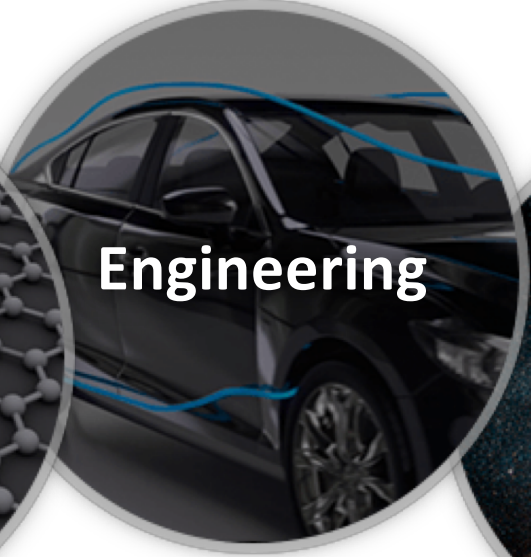Centro Nacional de Supercomputación

BSC

HPC: An enabler for all scientific fields

Materials, Chemistry & Nanoscience

Engineering

Astro, High Energy & Plasma Physics

Life Sciences & Medicine

Earth Sciences

Advances leading to:

- Improved Healthcare

- Better Climate Forecasting

- Superior Materials

- More Competitive Industry

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

The MareNostrum 4 supercomputer

Total peak performance: **13,7 Pflops/s**

Compute

General Purpose, for current workload
More than 11 Pflops/s

3,456 nodes of Intel Xeon v5 processors

Emerging Technologies, for evaluation of 2020 Exascale systems
3 systems:
Power9+NVIDIA, ARMv8, KNL/KNH

Storage
14 PB of GPFS
Elastics Storage System

Network
IB EDR/OPA
Ethernet
Operating System: SuSE

80% PRACE
Access: prace-ri.eu/hpc-access

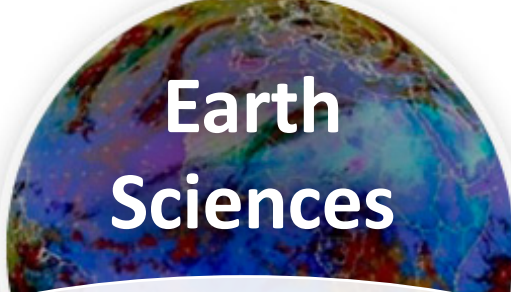**16%** RES — RED ESPAÑOLA DE SUPERCOMPUTACIÓN
Access: res.es

4% BSC Barcelona Supercomputing Center
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Mission of BSC Scientific Departments

Computer Sciences

Influence the way machines are built, programmed and used: programming models, performance tools, Big Data, computer architecture, energy efficiency

Earth Sciences

Develop and implement global and regional state-of-the-art models for short-term air quality forecast and long-term climate applications

Life Sciences

Understand living organisms by means of theoretical and computational methods (molecular modeling, genomics, proteomics)

CASE

Develop scientific and engineering software to efficiently exploit super-computing capabilities (biomedical, geophysics, atmospheric, energy, social and economic simulations)

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Projects

PRACE

Persistent pan-European HPC infrastructure
Open access, training and support
both to academic and industry
Open research, free at the point of usage

RES — RED ESPAÑOLA DE SUPERCOMPUTACIÓN

13 Supercomputers, , part of the ICTS
Coordinated by BSC
Manage HPC tech to promote the progress
for excellence and innovation in Spain

Application: Technical & Scientific
evaluation —> Access committee

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EOSCpilot

Support the first phase in the
development of the EOSC
Demonstrators integrating services and
infrastructures to show interoperability
and its benefits.

RDA — RESEARCH DATA ALLIANCE

Spanish node coordinated by BSC
Organization of activities, meetings,
workshops and training sessions to
promote Open Data and
interoperability.

EOSC-hub

The Project aims to create the
integration and service management
structure of the EOSC
EGI + IndigoOpenScienceCloud +
EUDAT + OpenAire

Open Science needs

Infrastructure

Computing power
Storage capacity
Network speed
Trusted centers
policy (security,
connectivity, costs
effectiveness, …)

Tools and services

AAI and interfaces
Data management
Seek and find
protocols
Workflow managers
Thematic services

Business model

Long-term
sustainability
Financial mechanisms
Local, national,
european
resources

Motivation/Incentives/Collaboration

Merits and rewards to
researchers for openness
reused resources
Interoperations, standards
Data experts

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Thank you

nadia.tonello@bsc.es