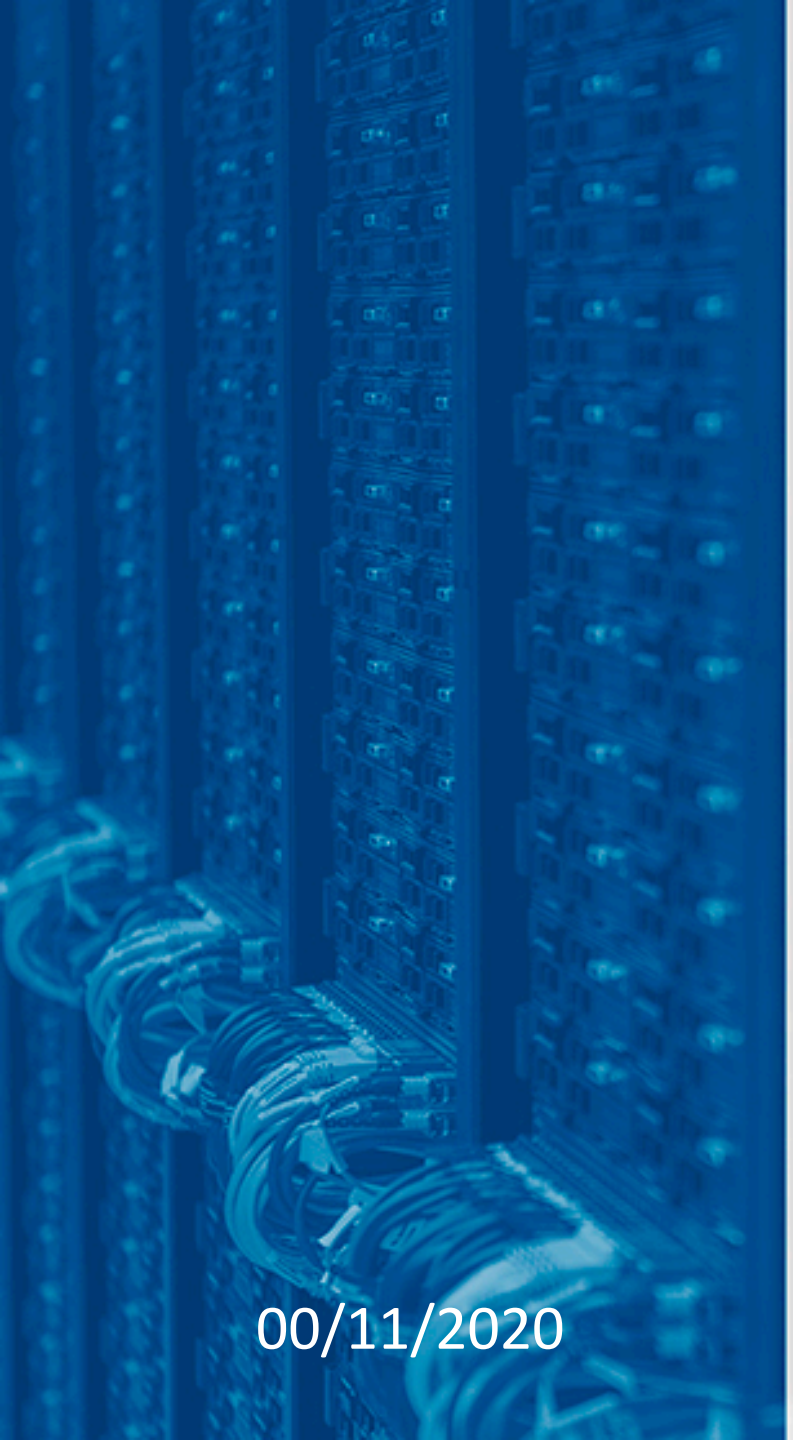

BSC
Barcelona
Supercomputing
Center
Centro Nacional de Supercomputación



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The Barcelona Supercomputing Center

00/11/2020

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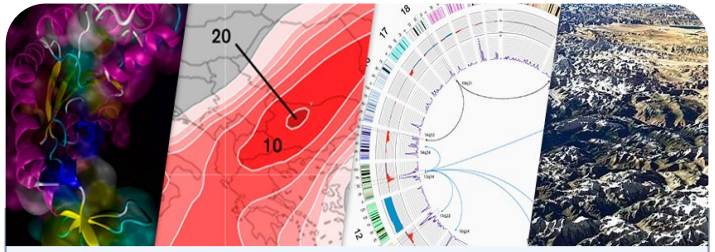
BSC-CNS objectives

Supercomputing services
to Spanish and EU researchers



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

PhD programme, technology
transfer, public engagement

BSC-CNS is a consortium that includes

Spanish Government	**60%**	Gobierno de España · Ministerio de Ciencia, Innovación y Universidades
Catalan Government	**30%**	Generalitat de Catalunya · Departament d'Empresa i Coneixement
Univ. Politècnica de Catalunya (UPC)	**10%**	Universitat Politècnica de Catalunya · BarcelonaTech

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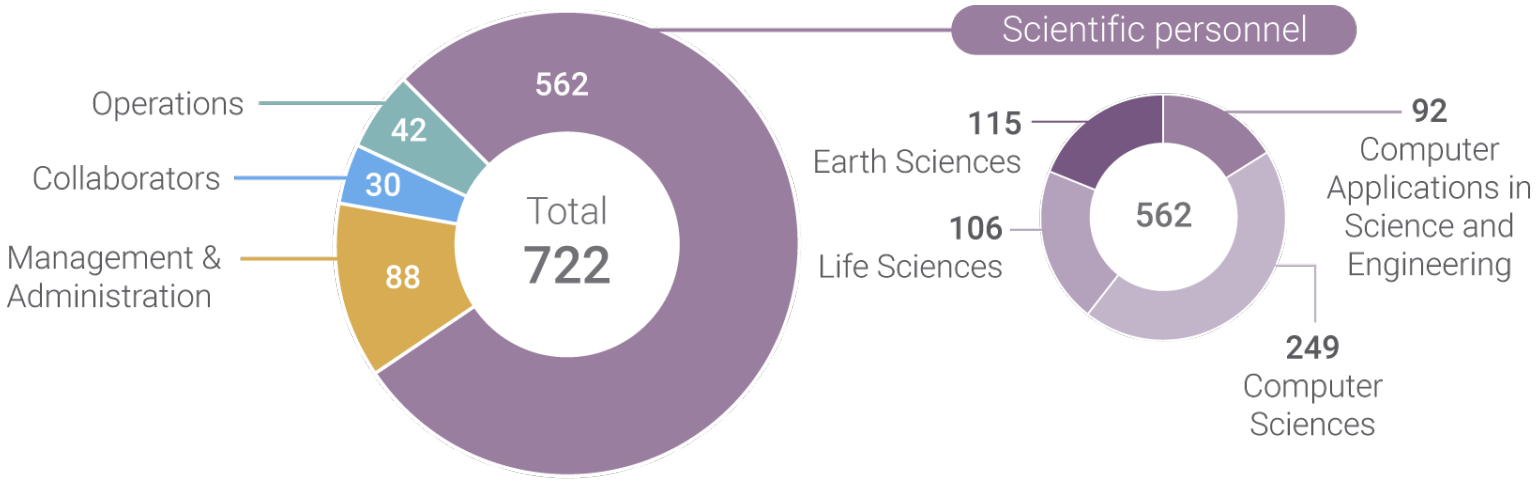
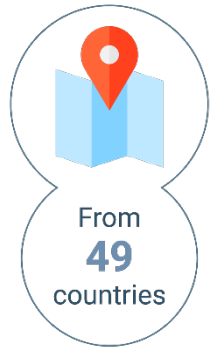
People

HR EXCELLENCE IN RESEARCH

Data as August 31, 2020





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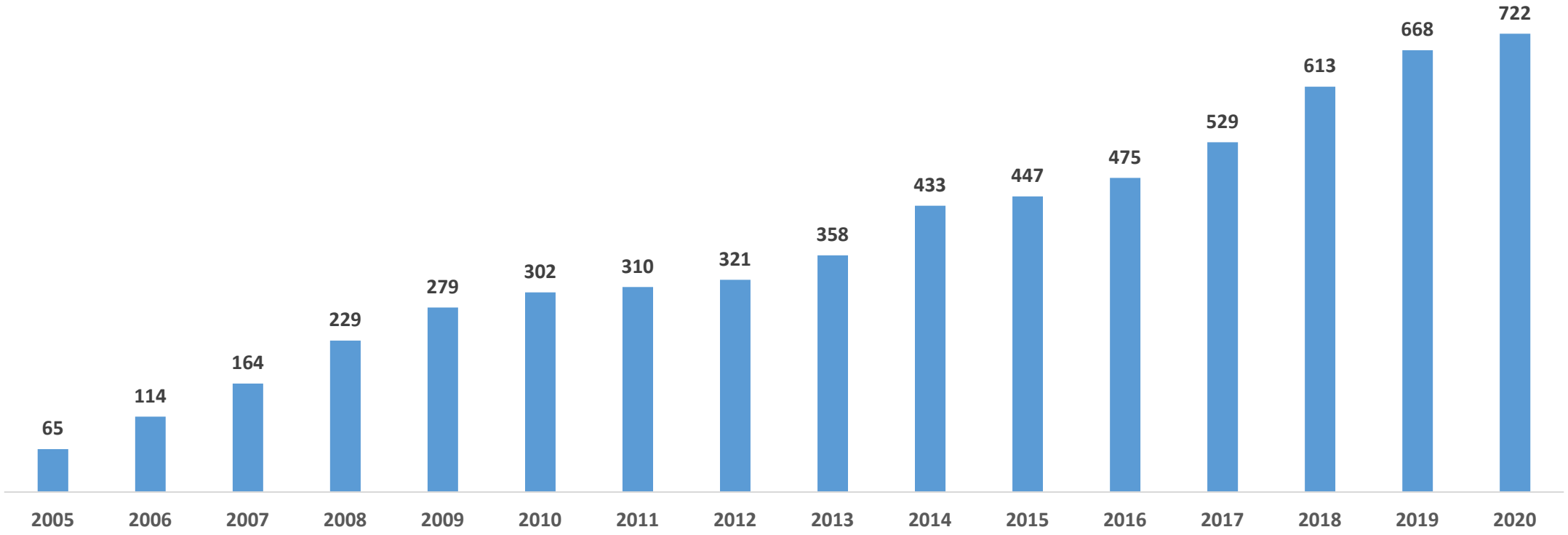
People evolution



BSC Staff evolution 2005 - 2020

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MareNostrum 4

Total peak performance: **13.9** Pflops		
General Purpose Cluster:	11.15 Pflops	(1-07-2017)
CTE1-P9+Volta:	1.57 Pflops	(1-03-2018)
CTE2-Arm V8:	0.65 Pflops	(12-2019)
CTE3-AMD:	0.52 Pflops	(12-2019)

MareNostrum 1
2004 – 42.3 Tflops
1st Europe / 4th World
New technologies

MareNostrum 2
2006 – 94.2 Tflops
1st Europe / 5th World
New technologies

MareNostrum 3
2012 – 1.1 Pflops
12th Europe / 36th World

MareNostrum 4
2017 – 11.1 Pflops
2nd Europe / 13th World
New technologies

Distributed supercomputing infraestructure

26 members, including **5 Hosting Members**
(Switzerland, France, Germany, Italy and Spain)

110 PFlops/s of peak performance on **7 world-class systems**

>25.000 Mcore hours for research awarded

779 scientific projects **enabled**

>17.000 people trained

>50 companies supported

PRACE

Access prace-ri.eu/hpc-access

Data as August 2020

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Spanish Supercomputing Network (RES)

RED ESPAÑOLA DE SUPERCOMPUTACIÓN

Infraestructuras Científicas y Técnicas Singulares

www.res.es

- Created 2006
- 12 institutions
- 13 supercomputers
- HPC resources for scientific community
- 12.000 Tflops
- +600 million CPU hours/year
- 3 calls/year
- Support team
- Data management services available
- +1.000 regular users
- +200 scientific papers annually
- Member of Unique Scientific and Technical Infrastructure network (**ICTS**).
- Coordinated by **BSC-CNS**

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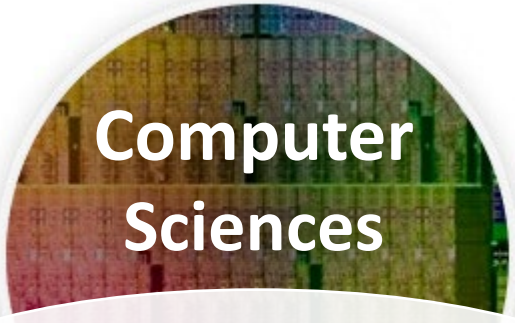
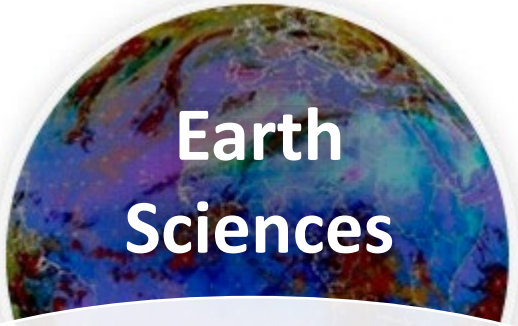
Updated: May 2020

Mission of BSC Scientific Departments



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



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

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

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

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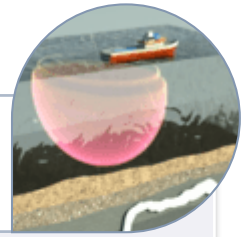
June 2020

Collaborations with Global IT industry 2020

Collaborations with Industry

REPSOL



Research into advanced technologies for the exploration of hydrocarbons, subterranean and subsea reserve modelling and fluid flows

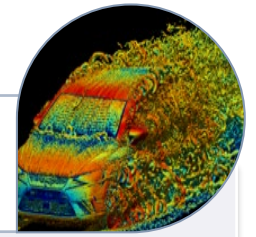
IBERDROLA

Research on wind farms optimization and wing energy production forecasts

CaixaBank

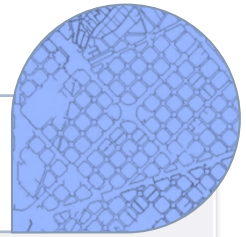
Collaboration agreement for the development of advanced systems of deep learning with applications to banking services

SEAT



Simulations to improve the understanding of the rotating wheels flow physics and its impact over the aerodynamic performance

Aigües de Barcelona



Advanced statistical methods to the optimization of maintenance, energy usage, and control of the city's water treatment and supply processes.

ikergune ETXETARgroup

Research on efficient data sensing, algorithms for analysis of industrial processes and visualization of large datasets of industrial data

ASEPEYO

Artificial Intelligence and Big Data techniques to improve the quality of care and personalized diagnosis

Rockwell Collins

BSC's dust storm forecast system licensed to be used to improve the safety of business flights.

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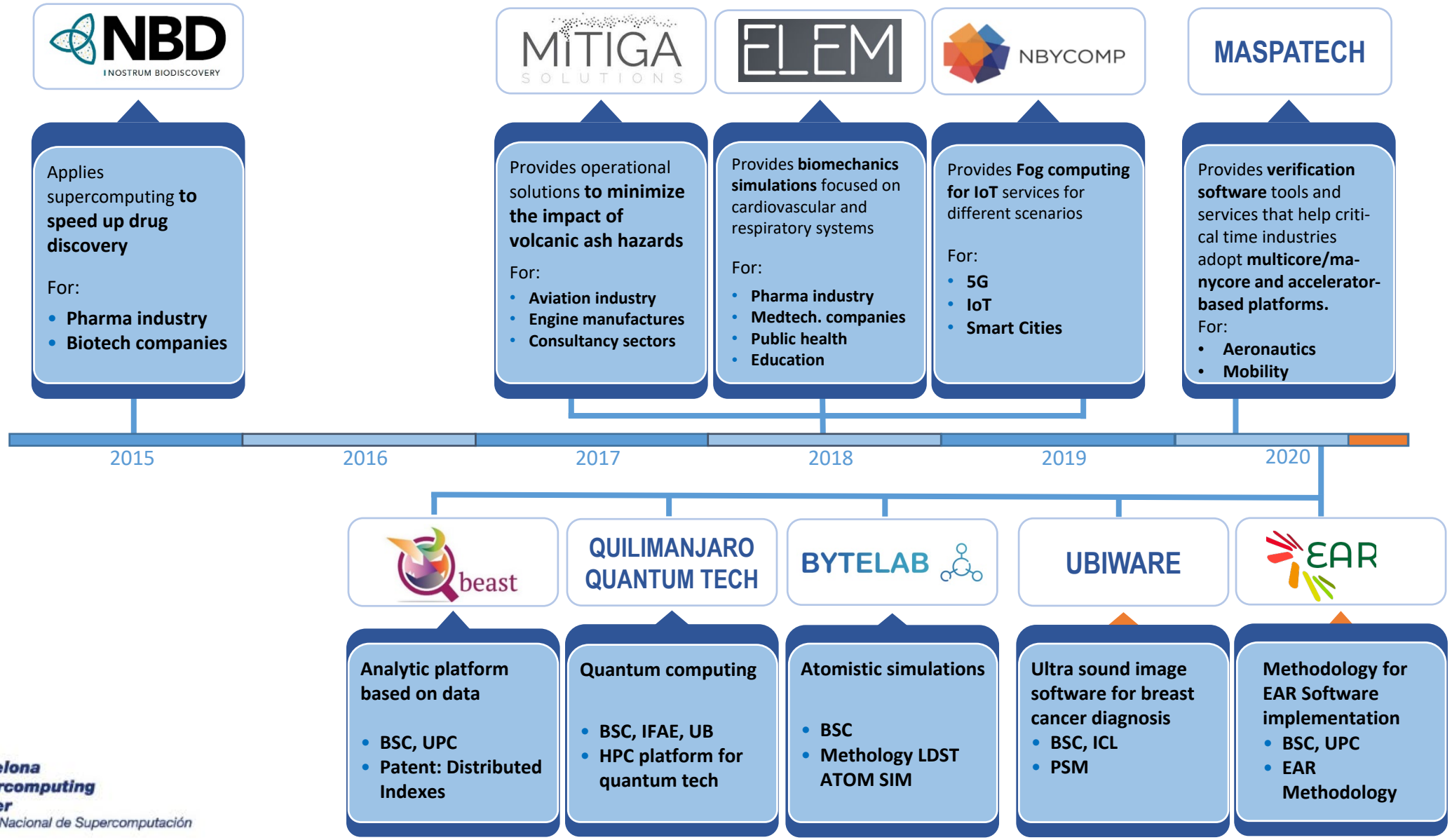
BSC's spin-offs



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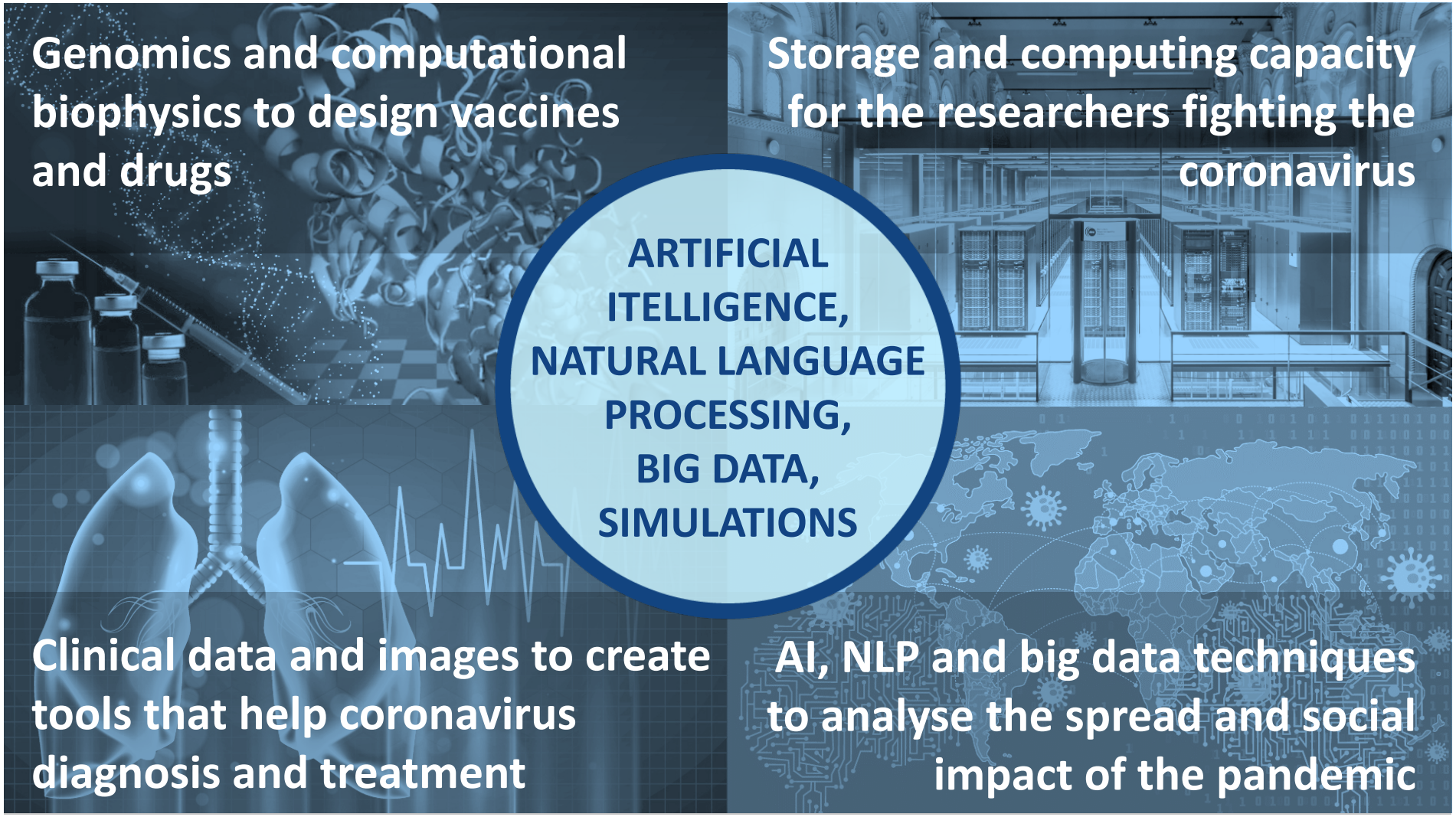
BSC against COVID-19 Pandemic



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MareNostrum 5. A European pre-exascale supercomputer

- **200 Petaflops** peak performance (200 x 10^{15})
- **Experimental platform** to create supercomputing technologies “made in Europe”
- **217 M€** of investment

EuroHPC Joint Undertaking

Hosting Consortium:

Spain **Portugal** **Turkey** **Croatia**




European Commission

Generalitat de Catalunya
Departament d'Empresa i Coneixement

Gobierno de España
Ministerio de Ciencia, Innovación y Universidades

UPC Universitat Politècnica de Catalunya BarcelonaTech

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The acquisition and operation of the EuroHPC supercomputer is funded jointly by the EuroHPC Joint Undertaking, through the European Union’s Connecting Europe Facility and the Horizon 2020 research and innovation programme, as well as the Participating States Spain, Portugal, Croatia, and Turkey

EuroHPC Joint Undertaking

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Thank you

mateo.valero@bsc.es
martorell@bsc.es