



RED ESPAÑOLA DE
SUPERCOMPUTACIÓN

***National data infrastructures: Spanish Network for
Supercomputing (RES)***

Spain and Portugal EOSC Tripartite event

***Oriol Pineda, PhD
10-13 October 2022***

Spanish Supercomputing Network (RES), since 2006



www.res.es

Membership update: September 2022

HPC and data management resources for the scientific community

- 14 institutions
 - 16 supercomputers
 - 9 data management centres
- +22 PFlop/s combined capacity
- +20 PB storage in 2022 (and growing)
- +800 million CPU hours/year ²⁰²²
- +1.000 regular users
- +200 scientific papers annually

- 3 HPC calls per year
- 1 Data call per year
- Applications Support Teams

- Member of Spanish Unique Scientific and Technical Infrastructure network (ICTS)
- Access Committee and Users Committee
- EuroHPC National Competence Centre
- Coordinated by **BSC-CNS**



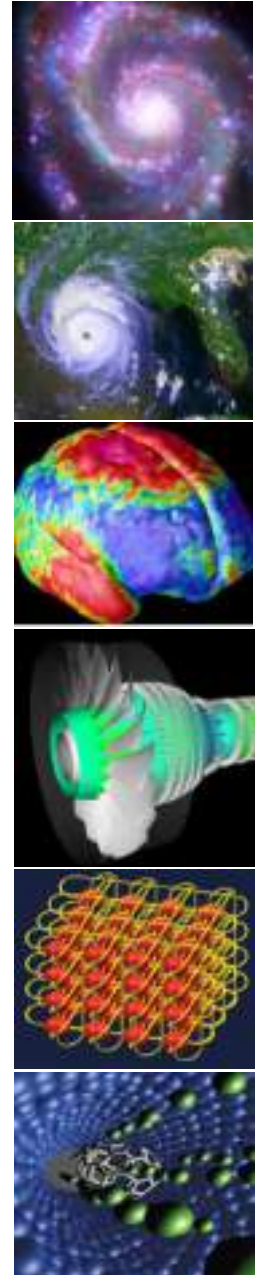
Access to computing resources

- **COMPETITIVE ACCESS TO LIMITED RESOURCES:**

- Competitive calls (60% success rate):
 - Scientific excellence criteria
 - 3 calls/year; around 800 M CPU h allocated / year
- 4 month access period to HPC resources in one of the RES machines
- Specialized support service
- Open also to:
 - Industry, SME to perform R&D projects
 - EU project proposals leaders to reserve CPU hours
 - Novel users do not have to show past record
- Users acknowledge the resources provided by the RES in their papers.

- **SCIENTIFIC AREAS:**

- Astronomy, Space and Earth Sciences (AECT)
- Physics (FI)
- Mathematics and Engineering (MI)
- Life and Health Sciences (BCV)
- Homogeneous Chemistry (QH)
- Heterogeneous Chemistry and Solids (QHS)

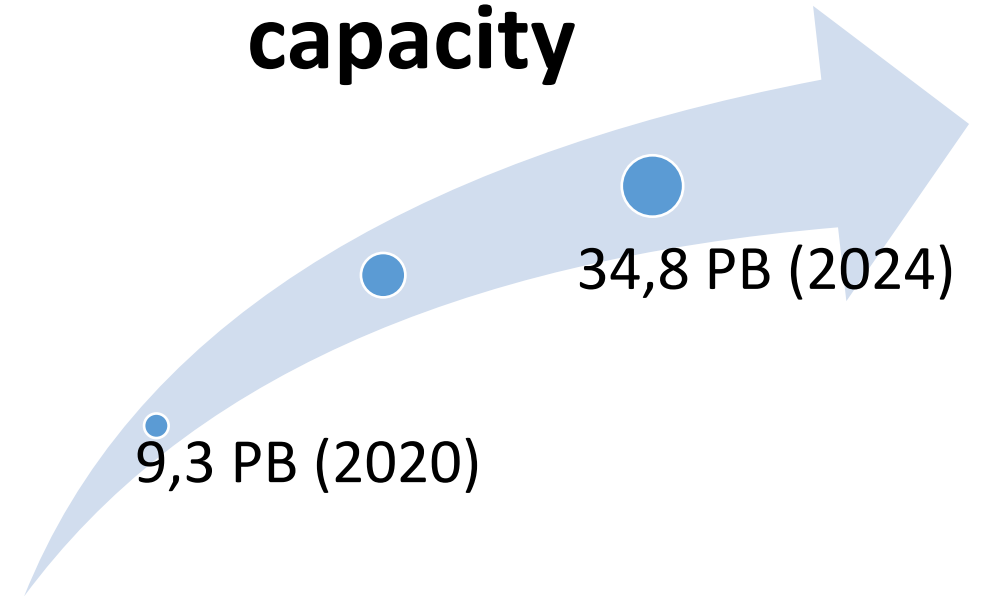


Access to data services

- **COMPETITIVE ACCESS TO LIMITED RESOURCES:**

- Service provided to store, share, publish, or connect large data sets with data and/or computing services on all the RES's nodes.
- Open to scientific groups with the need to store large volumes of data associated with their exploitation services can respond to the call.
- One competitive call:
 - RES resources are awarded according to criteria of excellence and impact of the research activity and are free for all research groups
 - 1 call/year; opens next November 2022.
 - Project range: 200 - 1000 TB in 3-5 years
- 1st Call (2020): 8 projects selected
- 2nd Call (2021): 12 projects selected
- Specialized support service

Data storage capacity



RES events: Networking, training and sharing knowledge

Annual RES Users Conference



Scientific seminars (sponsored by RES)



Technical training workshops



How to apply?

RES intranet: <https://www.bsc.es/res-intranet>



Barcelona Supercomputing Center
Centro Nacional de Supercomputación

RES - Red Española de Supercomputación
Intranet Area

jordi.mascastella@bsc.es

.....

Log in

Please, enter your username (e-mail) and your password in order to log in to the RES Intranet Area. If you do not have an account or you forgot your password, click one of the options below.

Create new account I forgot my password

INFORMATION
More information about RES in <https://www.res.es/>
The list of accepted activities for 2nd period 2020 was published on June, 25th. These activities will start on July 1st, 2020.
The deadline for next period applications is 2020, September 17th - 11:00, CEST.



- Researchers present a **proposal** which includes research project description, technical requirements and research group experience.
- Accepted proposals have access to RES supercomputers for 4 months.
- Granted time can be: hours with priority (hours A) or without priority (hours B)

New Application

New activity application for period 2020-2 (2020, July 1st - 2020, October 31st)

Before applying ...

The deadline for next period applications is 12/05/2020 11:00:00, CEST.

Dear user,

Each application to the RES is expected to be destined to perform an activity (a term that can be understood as one experiment or several) and not for long term projects. The RES understands that one project can include more than one activity. Considering that, an applicant can submit more than one application for different activities framed in a same global project.

For activities whose computing needs require access to resources during more than a period to be properly developed, applicants can request access for up to two periods (a first period as new application and a second period as continuation activity). The request for a continuation will be evaluated and the applicants will have to report to the Access Committee the results obtained during the first period. For more information [click here](#).

If you need help or any clarification, please contact us in applications@bsc.es.

Thanks for your cooperation,
Spanish Supercomputing Network.


 Before applying, read the [Access Protocol to the equipment of the Barcelona Supercomputing Center](#) and the [Spanish Supercomputing Network \(RES\) document](#).

[+ Create new application](#)

New Application

New activity application for period 2020-3 (2020, November 1st - 2021, February 28th)

1. COVID-19

 In accordance with the RD8/2020 of extraordinary urgent measures to face the economic and social impact of COVID-19, which establishes measures to support research on COVID-19 as a priority objective of the Government, promoting research on the disease for the development of effective drugs and vaccines that help contain the impact of future outbreaks, the RES Council propose to temporarily include in the access protocol the following criteria:

- for activities related to COVID-19. The researcher must mark it in the web application and it will be validated the corresponding scientific panel
- for the call that ends on May 12, and which gives access from July to October 2020, both included
- for activities led or with confirmed participation of researchers located in Spain
- for activities that exceed a minimum quality threshold

they will have priority, up to 50% of the capacity of the RES in this period.

Is this activity related to COVID-19?

Select an option

New Application

New activity application for period 2020-2 (2020, July 1st - 2020, October 31st)

1. General Information

a) Activity Title

b) Area

Your application will be evaluated by different expert teams depending on your area selection.

c) Type of application

Standard Activity for the next 4 months

Standard Activity for the next 4 months (For a novel user, without previous expertise in HPC), it will remove from the review the evaluation of the previous expertise of the team in the HPC. This option can be selected only for users with less than 1 year of expertise in the usage of HPC.

Pre-reservation of hours for European projects (this option allow the users submitting a EU proposal to have a reservation of hours for a maximum of 2 years. The hours will be granted only if the EU proposal is approved and granted by the EC).



2. Research Project Description

a) Brief description of the Project

If this Activity takes place in the context of a Scientific Research Project, give a brief description of the Project, including the reference of National or International grants which support it. Summarize the research in the context of the current state-of-the-art, including references if appropriate. (Maximum 5000 characters).

b) Grants and funded projects related to this activity

[+ Add New Grant](#)

c) Brief description of the Project (if this Activity takes place in the context of a Technology or Industrial Project)

If this Activity takes place in the context of a Technology or Industrial Project, give a brief description of the Project, including the potential impact resulting from this activity, in measurable terms (potential for patent applications, competitive advances, prototypes, new products, economic impact, etc). (Maximum 5000 characters).

d) Specific Activity proposed

Describe the specific Activity proposed. Discuss the need for Supercomputing facilities. Describe in detail the specific calculations you plan to do, and their relevance to the Research Project. If the Activity is a 'Long Term Activity' (which will extend over several application periods), you must clearly specify which calculations will be done in this period, and which ones will be done in following periods. (Maximum 10000 characters).

e) Computational algorithms and codes outline

Outline the computational algorithms and codes, and their suitability for supercomputing facilities. Describe any benchmarks performed on HPC systems. (Maximum 3000 characters).



3. Software and Numerical Libraries

Software components that the project team requires for the activity.

Please select any software components that the project team requires for the activity. If any program required for the application is license protected, the user will need to provide the license in order to use the program in the RES infrastructure.

a) Applications + Libraries

- JONA
- ABINIT
- ABYSS
- ALFRED
- ALGLIB
- ALLECCOUNT
- ALLPATHS

b) Compilers and Development Tools

- CUDA
- GCC
- GO
- HPCX
- IBM
- INTEL
- LLVM

c) Utilities + Parallel Debuggers and Performance Analysis Tools

- 7ZIP
- ACE
- ANACONDA
- ANACONDA3
- AUTOCNF
- AUTOTOOLS
- BISON

d) Other requested software

(Additional information might be requested by the Access Committee)

e) Proprietary software

In case of proprietary software, you should include software name, short description, link to web page with full software description.



4. Research Team Description

a) Personal Data

Name of Team Leader

Gender

Select an option

Institution

e-mail

Phone

Nationality

The employment contract of the activity leader with the research organization is valid at least 3 months after the end of the allocation period.

b) Curriculum Vitae of the Team Leader

Please provide a brief Curriculum Vitae of the Team Leader, including any relevant information that may help in demonstrating his/her qualifications to lead the proposed activity. (Maximum 2000 characters)

c) Names of other researchers involved in this activity

Include only name, institution and e-mail.

d) Relevant publications

List the five most relevant publications, in the last five years, from the members of the research team that guarantees the scientific quality of the proposed Activity and demonstrate the qualifications of the team to complete it.



6. Abstract for publication

Max. 850 characters, ready for publication in the web page in case the proposal is accepted.

7. Contact with CURES during last year

[Information about the RES Users Committee \(CURES\)](#)

a) User has contacted the CURES during last year

Yes No

8. Usage Terms & Conditions

I have read and accept the [Usage Terms & Conditions](#).

The data will be saved. You may continue editing it until the deadline. It will not be accessible to the Access Committee if you do not submit it.

RES Users' Committee

- **CURES aims to provide advice and feedback to RES coordinators:**
 - Promotes optimal use of high performance computing facilities
 - Shares information about users' experiences
 - Voices user concerns
- You can **contact CURES** through RES intranet:



RES Users Committee

[Documents](#) [Mailbox](#) [Contact CURES](#)

Information and available documents related to CURES (RES Users Committee).
Please, find below the documents that CURES has published and that are of interest to all the RES Users.

Documents

-  CURES_rules.pdf
-  RES Application guide.docx

Access to internationalization
Programs, projects, etc



Access to knowledge
and expertise
Scientific seminars



Access to training and skills
development
Open training courses and
technical workshops



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Access to Spanish
supercomputing facilities
Free allocation of computing
hours to researchers and
industry staff



Access to European
supercomputing
facilities
Mobility of researchers
and industry staff



Access to networking and
awareness
Annual Users Conference,
RES Newsletter



Access to business innovation
Competence center
DIH, One-stop shop



MareNostrum 5. A European pre-exascale supercomputer

- **314 Petaflops** peak performance (314×10^{15})
- World-changing scientific breakthroughs such as the creation of digital twins and the advancement of precision medicine
- Total investment: **>200 M€**

Hosting Consortium

Spain



Portugal



Turkey



Quantum Spain

The definitive boost to the quantum computing ecosystem in Spain

- Quantum Spain aims to promote and finance a **competitive and complete quantum computing infrastructure** in Spain.
- Quantum Spain is an initiative promoted by the **Ministry of Economy through the Secretary of State for Digitization and Artificial Intelligence** and financed with the Recovery Funds.
- Budget: **€22 million**
- Execution: **01/01/22 – 31/12/25**

España | digital ²⁰₂₆



 **Plan de Recuperación, Transformación y Resiliencia**



Financiado por la Unión Europea
NextGenerationEU


RED ESPAÑOLA DE SUPERCOMPUTACIÓN

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applications@res.es
dissemination@res.es

Follow us for info updates!

RES @RES_HPC - 28 ene.
DO NOT MISS! The 11th call for applications is OPEN y (6) 1 20th February 2020. @HPCEuropa3 @ESC_ON5 access to Europe's biggest Supercomputers #HPC + mobility program (travel grants, etc.)



RES @RES_HPC - 7 feb.
El 12-13 de febrero nos encontramos en #TokyoEuroH2020 #ICTSNews y empieza ya tu camino hacia la innovación en colaboración con una infraestructura científica y técnica singular (ICTS)



RES @RES_HPC - 20 feb.
#HPC boosts research production in 2020. The first 10 papers of this year using @RES_HPC resources: res.eu/Investigaci.... @Dziawlak et al. measured the force-induced changes at the single-monomer level in polymers bending and twisting around carbon-carbon single bonds #ICTSNews



CénitS - COMPUTAEX @cenits - 21 feb.
El nuevo Supercomputador de Extremadura, #ULSITANIAMI, ya se encuentra en funcionamiento. CénitS alcanza así una capacidad de cálculo de 93 TFlops más 120 TFlops de computación gráfica, sobre red InfiniBand de hasta 100 Gbps, y un total de 3.696 cores y 40.960 cuda cores.



RES Newsletter





THANK YOU!





About RES

- The **Spanish Supercomputing Network** (RES, from Red Española de Supercomputación), established in 2007 by the Spanish Ministry of Science and Education, is a *Unique Scientific and Technical Infrastructure (ICTS)* distributed throughout Spain, composed of 14 nodes interconnected with high-speed networks. The mission of RES is to offer the necessary computing and data management services and resources to support the development of top-quality, cutting-edge and highly-innovative research projects, made available to the scientific community through competitive calls based on the scientific excellence of the proposals received.
- RES is composed of the following members: Barcelona Supercomputing Center - Centro Nacional de Supercomputación (acting as coordinator), Universidad de Zaragoza-BIFI, Universidad de Cantabria, Universidad de Valencia, Universidad de Málaga, Universidad Autónoma de Madrid, Instituto de Astrofísica de Canarias, Centro de Supercomputación de Galicia, Supercomputación de Castilla y León, Centro de Supercomputación de Extremadura, Consorcio de Servicios Universitarios de Catalunya, Port d'Informació Científica PIC, NASERTIC (Navarra) and Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas CIEMAT.