RES: HPC Services for Spain

• The RES was created in 2006.

• It is coordinated by the Barcelona Supercomputing Center (BSC-CNS).

• It forms part of the Spanish “Map of Unique Scientific and Technical Infrastructures” (ICTS).
RES: HPC Services for Spain

- **Objective**: coordinate and manage high performance computing services to promote the progress of excellent science and innovation in Spain.
- It offers HPC services for **non-profit, open R&D purposes**.
- Since 2006, it has granted more than **1,200 Million CPU hours** to 2,628 research activities.

**Research areas**

- Mathematics, physics and engineering: 29.87%
- Astronomy, space and earth sciences: 23.14%
- Chemistry and materials sciences: 28.07%
- Life and health sciences: 18.92%
- AECT
- BCV
- FI
- QCM

Hours granted per area
RES supercomputers

**BSC (MareNostrum 4)** 165888 cores, 11400 Tflops
- Main processors: Intel(R) Xeon(R) Platinum 8160
- Memory: 390 TB
- Disk: 14 PB

**UMA (Picasso)** 4016 cores, 84Tflops
- Main processors: Intel SandyBridge-EP E5-2670
- Memory: 22400 GB
- Disk: 720 TB

**UV (Tirant 3)** 5376 cores, 111,8 Tflops
- Main processors: Intel SandyBridge-EP E5-2670
- Memory: 10752 GB
- Disk: 14 + 10 TB

**CSUC (Pirineus)** 2784 cores, 283,66 Tflops
- Main processors: Intel(R) Xeon(R) Platinum 8160
- Memory: 12000 GB
- Disk: 200 TB

**CSUC (Canigo)** 384 cores, 33,2 Tflops
- Main processors: Intel(R) Xeon(R) Platinum 8160
- Memory: 9000 GB
- Disk: 200 TB
# RES supercomputers

<table>
<thead>
<tr>
<th>Supercomputer</th>
<th>Cores/TFlops</th>
<th>CPU/TFlops</th>
<th>Memory</th>
<th>Disk</th>
</tr>
</thead>
<tbody>
<tr>
<td>CénitS (Lusitania 2)</td>
<td>800 cores, 33 Tflops</td>
<td>Intel Xeon E5-2660v3, 2.6GHz</td>
<td>10 GB</td>
<td>328 TB</td>
</tr>
<tr>
<td>CénitS (SandyBridge)</td>
<td>2688 cores, 56 Tflops</td>
<td>Intel Sandybridge Xeon</td>
<td>5376 GB</td>
<td>328 TB</td>
</tr>
<tr>
<td>BSC (MinoTauro)</td>
<td>624 cores, 251 Tflops</td>
<td>39x 2 Intel Xeon E5-2630 v3</td>
<td>20 TB</td>
<td>14PB (shared with MN4)</td>
</tr>
<tr>
<td>CESGA (FinisTerrae 2)</td>
<td>7712 cores, 328Tflops</td>
<td>Intel Xeon E5-2680v3</td>
<td>40 TB</td>
<td>960 TB</td>
</tr>
<tr>
<td>UC (Altamira 2+)</td>
<td>5120 cores, 105 Tflops</td>
<td>Intel SandyBridge</td>
<td>15.4 TB</td>
<td>2PB</td>
</tr>
<tr>
<td>UZ (Caesaraugusta)</td>
<td>2014 cores, 80.5 Tflops</td>
<td>Intel E5-2680v3, 2.5GHz</td>
<td>5400 GB RAM memory</td>
<td>219TB</td>
</tr>
</tbody>
</table>
RES supercomputers

SCAYLE (Caléndula)  2432 cores, 50 Tflops
Main processor: Intel SandyBridge Xeon
Memory: 4864 GB
Disk: 600 TB

UAM (Cibeles)  368 cores, 14 Tflops
Main processor: Intel Xeon E5-2630 v3, 2.40GHz
Memory: 896 GB
Disk: 80 TB

UAM (SandyBridge) – coming soon – 2688 cores, 56 Tflops
Main processor: Intel SandyBridge Xeon, 2.60GHz
Memory: 5376 GB
Disk: 80 TB

IAC (LaPalma)  4032 cores, 83 Tflops
Main processor: Intel SandyBridge
Memory: 8064 GB
Disk: 60 TB

BSC (CTE - Power)  52 cores, 1485 Tflops
Main processor: IBM Power 9 with 20 cores & 4 GPU V100
Memory: 27 TB
Disk: 14PB (shared with MN4)

Resources granted: CPU hours

Million hours

- Requested hours
- Awarded hours (A+B)
How to apply?

• RES resources are **open to researchers and spin-offs**:
  
  0 **Computing resources**: CPU hours and storage
  0 **Technical support**: application analysis, porting of applications, search for the best algorithm… to improve performance and ensure the most effective use of HPC resources.
  0 **Free of cost**

• Three **open competitive calls** per year.

<table>
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<th>Period</th>
<th>Deadline for applications</th>
<th>Starting date</th>
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<td>P1</td>
<td>January</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; March</td>
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<tr>
<td>P2</td>
<td>May</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; July</td>
</tr>
<tr>
<td>P3</td>
<td>September</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; November</td>
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**Next deadline: May 2019**
How to apply?

RES intranet: [https://www.bsc.es/res-intranet](https://www.bsc.es/res-intranet)

- Researchers present a **proposal** which includes research project description, technical requirements and research group experience.

- Accepted proposals have access to RES computers for **4 months**.

- Granted time can be: hours with priority (hours A) or without priority (hours B)
Who can apply?

• RES resources are **aimed at open R+D+I activities**:

  o **Researchers** from academia and public R&D institutions
  o **Spin-offs** during their first 3 years from its creation
  o **Collaboration projects** between private companies and research groups from academia or public institutions
  o **Open to international applicants**, but we recommend the collaboration with researchers from Spanish institutions
Proposal evaluation

Submit

Formal evaluation

Technical evaluation

Access committee

Final report of accepted activities

Scientific experts panel
Activity length

- Accepted proposals have access to RES supercomputers for 4 months. If your activity needs more time to be properly developed, you can ask for a continuation activity:

New activity (4 months) → Report dissemination information

Continuation activity (4 months) → Report dissemination information

Continuation activities

- The application form is simplified
- Are preferably allocated to the same machine
- In the evaluation, one reviewer is kept from the previous activity and the second reviewer changes
Mobility grants for researchers using HPC resources

Short stays to visit scientific hosts (3 weeks – 3 months)

Eligibility: open to researchers from academia or industry whose research needs HPC

Funds for travel and living allowance

Access to European HPC facilities

http://www.hpc-europa.eu/
Contact us!

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THANK YOU!