Job Reference

408_23_CASE_PNM_R2

Position

Heterogeneous computing (R2)

Data de tancament

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About BSC

The Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS) is the leading supercomputing center in Spain. It houses MareNostrum, one of the most powerful supercomputers in Europe, was a founding and hosting member of the former European HPC infrastructure PRACE (Partnership for Advanced Computing in Europe), and is now hosting entity for EuroHPC JU, the Joint Undertaking that leads large-scale investments and HPC provision in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific progress. BSC combines HPC service provision and R&D into both computer and computational science (life, earth and engineering sciences) under one roof, and currently has over 900 staff from 55 countries.

Look at the BSC experience:
BSC-CNS YouTube Channel
Let's stay connected with BSC Folks!

We are particularly interested for this role in the strengths and lived experiences of women and underrepresented groups to help us avoid perpetuating biases and oversights in science and IT research.

Context And Mission

Supercomputers are indispensable tools for solving the most challenging and complex scientific and technological problems through simulations. The Partnership for Advanced Computing in Europe, PRACE, has been a unique persistent pan-European Research Infrastructure for High Performance Computing (HPC) and forms the top level of the European HPC ecosystem. BSC has been one of the core partners of PRACE providing a tier-0 system like MareNostrum4 to the PRACE computing resources. BSC is now involved in EuroHPC and will soon host MareNostrum5, a pre-exascale heterogeneous cluster.
The mission revolves around Alya, a high-performance computational mechanics code developed within the CASE department to solve complex coupled multiphysics/multi-scale/multi-domain problems, which are mostly coming from the engineering realm. Among the different physics solved by Alya, we can mention incompressible/compressible flows, non-linear solid mechanics, chemistry, particle transport, heat transfer, turbulence modelling, electrical propagation, etc.

The candidate will work in the development of HPC techniques to enhance the scalability and computational performance of Alya for heterogeneous architectures. This will include porting to accelerators as well as inter and intra node level optimizations. The candidate will be required to work with MPI, OpenMP, OpenACC among other programming languages, mainly focusing on heterogeneous computing. He/she will work in close collaboration with the department scientists but also with computer science department to support the implementation of runtime libraries (like DLB) or for the good usage of performance tools (extrae, paraver).

Key Duties

- Port the physical modules of Alya and required kernels to GPU architectures using OpenACC and OpenMP
- Improve the performance of existing parallel algorithms, improving the serial efficiency and the scalability, changing if necessary the code or helping the developers with their required modifications.
- Provide consultancy to scientists on new computer architectures and programming models.
- Generate performance analysis and benchmarks for selected applications and report the results to the applications developers.
- Collaborate with other functional groups at European and International level on technical matters related to supporting scientific application work.

Requirements

- Education
  - PhD in computer science or in any other scientific field but directly related to HPC or Bachelor in Computer Science or related discipline and at least 3 years of experience in a similar position working with HPC codes

- Essential Knowledge and Professional Experience
  - GPU programming
  - Experience porting and optimizing applications on UNIX-based systems experience in Fortran, C, MPI, OpenMP, and parallel methods.
  - Experience supporting and collaborating with external partners.

- Additional Knowledge and Professional Experience
  - Experience using performance analysis tools, and parallel debuggers.
  - Good understanding of Linux environment and Shell scripting.
  - Experience in managing big and collaborative projects and experience with git
  - A thorough understanding of high performance computing architectures.

- Competences
  - Excellent communication and interpersonal skills to be able to work within a team to complete tasks on schedule.
Conditions

- The position will be located at BSC within the CASE Department
- We offer a full-time contract (37.5h/week), a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, restaurant tickets, private health insurance, support to the relocation procedures
- Duration: Open-ended contract due to technical and scientific activities linked to the project and budget duration
- Holidays: 23 paid vacation days plus 24th and 31st of December per our collective agreement
- Salary: we offer a competitive salary commensurate with the qualifications and experience of the candidate and according to the cost of living in Barcelona
- Starting date: asap

Applications procedure and process

All applications must be made through BSC website and contain:

- A full CV in English including contact details
- A Cover Letter with a statement of interest in English, including two contacts for further references - Applications without this document will not be considered

In accordance with the OTM-R principles, a gender-balanced recruitment panel is formed for every vacancy at the beginning of the process. After reviewing the content of the applications, the panel will start the interviews, with at least one technical and one administrative interview. A profile questionnaire as well as a technical exercise may be required during the process.

The panel will make a final decision and all candidates who had contacts with them will receive a feedback with details on the acceptance or rejection of their profile.

At BSC we are seeking continuous improvement in our recruitment processes, for any suggestions or feedback/complaints about our Recruitment Processes, please contact recruitment [at] bsc [dot] es.

For more information follow this link

Deadline

The vacancy will remain open until a suitable candidate has been hired. Applications will be regularly reviewed and potential candidates will be contacted.

OTM-R principles for selection processes

BSC-CNS is committed to the principles of the Code of Conduct for the Recruitment of Researchers of the European Commission and the Open, Transparent and Merit-based Recruitment principles (OTM-R). This is applied for any potential candidate in all our processes, for example by creating gender-balanced recruitment panels and recognizing career breaks etc.

BSC-CNS is an equal opportunity employer committed to diversity and inclusion. We are pleased to consider all qualified applicants for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, disability or any other basis protected by applicable state or local law.

For more information follow this link