



## PRACE 12<sup>th</sup> Call for Proposals for Project Access including Multi-year

**Opening date: 30 September 2015**

**Closing date: 11 November 2015, 12:00 (noon) CET**

**Response of applicants to reviews: 18 January 2016 – 22 January 2016**

**Anticipated allocation decisions: last week of February 2016**

**Allocation start date of awarded proposals: 14 March 2016**

**Allocation end date of award: 13 March 2017**

**Type of access: Project Access and Multi-Year Project Access**

**PRACE HPC systems available:**

“Fermi”, IBM Blue Gene/Q (CINECA, Italy)

“MareNostrum”, IBM System X iDataplex (BSC, Spain)

### Introduction

The Partnership for Advanced Computing in Europe (PRACE) is an international non-profit association with its seat in Brussels. The mission of PRACE is to enable high impact scientific discovery and engineering research and development across all disciplines to enhance European competitiveness for the benefit of society. PRACE seeks to realize this mission by offering a persistent world class high performance computing (HPC) computing and data management resources and services for scientists and researchers from academia and industry in Europe, through a peer review process. The Implementation Phase of PRACE receives funding from the EU's Seventh Framework Programme (FP7/2007-2013) under grant agreement RI-312763 and from the EU's Horizon 2020 research and innovation programme (2014-2020) under grant agreement 653838.

PRACE is currently in a transition phase to a new funding and governance model. Unfortunately this necessitates a temporary reduction in the number of Tier-0 resources available for Call 12. The computer systems and their operations accessible through PRACE are provided for this 12<sup>th</sup> call by 2 PRACE members (BSC representing Spain and CINECA representing Italy). Substantial additional systems and resources will be available in Call 13, which will open in Spring 2016.

Scientists and researchers from around the world can apply for access to PRACE resources.

Industrial users can apply if they have their head offices or substantial R&D activity in Europe.

The Call is open to:

**\*Project Access:** Proposals can be based on a 12-months schedule, or, for Multi-year Projects, on a 24- or 36-months schedule. The allocation of awarded resources is made for 1 year at a time with provisional allocations awarded for the 2<sup>nd</sup> and 3<sup>rd</sup> year.

Additionally, the Call:

\*reserves 0.5% of the total resources available for this call for **Centres of Excellence (CoE)** as selected by the EC under the E-INFRA-5-2015 call for proposals.

The PRACE Access Committee, composed of leading European scientists and engineers, ranks the project proposals that will be awarded access to PRACE resources.

Further details on the standard application procedure can be found on the [PRACE website](#) (“How to apply” menu).

## 1. Scope of the Call

The PRACE 12<sup>th</sup> Call for Proposals is intended for large-scale projects of excellent scientific merit and for which a significant European added-value and major impact at International level is anticipated.

Applications to PRACE computing resources must use codes that have been previously tested and that demonstrate high scalability and optimisation to multi-core architectures or that demonstrate a requirement for ensemble simulations that need a very large amount of CPU overall. The need for PRACE computing performance must be clearly spelled out in the proposal. Further details on the minimal requirements for using each system are available on the [PRACE website](#) (“Call Announcement” – document titled ‘Technical Guidelines for Applicants to PRACE Call’).

Proposals for code testing and optimisation are outside of the scope of this call. A separate call for [Preparatory Access](#) is continuously open (see the “Call Announcement” page on the [PRACE website](#) for further details about [Preparatory Access calls](#)).

Proposals must demonstrate scientific excellence and include elements of novelty and transformative aspects. They must have a recognised scientific impact, validated in a coherent dissemination plan. Possible practical and timely applications are therefore desirable. The proposal should demonstrate the potential of achieving results which will be published in high impact scientific peer-reviewed journals and conferences.

Proposals requesting resources on a single system or on more than one system are allowed. Please note that a proposal asking for resources on more than one system has to clearly justify the need for those resources. The proposal will be either awarded or rejected as a whole (no part(s) of the proposal can be proposed for awards).

## 1.1. Projects Access

**Project Access** is for access to PRACE Tier-0 computing resources for projects which use codes that may have been previously tested and must have demonstrated high scalability and optimisation.

The 12<sup>th</sup> PRACE Call for Proposals is intended for large-scale projects of excellent scientific merit and for which a significant European added-value and major impact at international level is anticipated.

Proposals for Project Access must have computer codes and data ready to run on the Tier-0 systems. They must demonstrate the need for Tier-0 resources. They must demonstrate scientific excellence and focus on topics of major relevance for European research and include elements of novelty, transformative aspects. They must have a recognised scientific impact, validated in a coherent dissemination plan. Possible practical and timely applications are therefore desirable. The proposal should demonstrate the possibility of achieving results which will be published in high impact scientific peer-reviewed journals and conferences.

For proposals requesting access as a follow-up to a previous Project Access, **it is mandatory to present the final report (or a progress report) of the previous project at the time of the closure of the Call**. This report should be sent to the PRACE peer-review team at [peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu) by the Call deadline date. The report will be analysed by the scientific reviewers and Access Committee members to evaluate the status of the on-going access and whether the need for the follow-up project is acceptable or not.

The template document for this report is available on the [PRACE website](#) ("Information for PRACE Awardees"), and it must be carefully respected.

### 1.1.1- 1-Year Project Access

Allocations for standard 1-year access will be starting on **March 14, 2016**.

### 1.1.2- Multi-Year Project Access

This PRACE 12<sup>th</sup> Call for proposals is open to Multi-Year Project Access inviting applications lasting 2 or 3 years. Multi-Year Projects Access are subject to the same eligibility and assessment criteria as applications for standard 1-year Project Access. In addition, the proposals will have to demonstrate their need for a resource allocation of more than a year.

Allocation of resources is made for one year at a time, with provisional allocations awarded for the second and/or third year. All Multi-year Access Projects are subject to annual peer review, based on a progress report and a face-to-face meeting. Allocation of resources shall be adjusted accordingly.

The total resources allocated to the Multi-year Access Projects cannot exceed 10% of the total resources available for **\*for each system\*** by yearly period.

## 1.2. Support to CoE

0.5% of the total resources available for this call is reserved for Centres of Excellence (CoE) as selected by the EC, under the E-INFRA-5-2015 call for proposals.

CoE don't need to apply to this PRACE call – if funded by the EC, CoE requesting access to PRACE resources will be awarded PRACE resources from this reserve.

Resources will be equally distributed among the EC-selected CoE. They will be asked to provide a description of their usage of the resources for technical validation, and a final report with the obtained results. All forms will be sent in due time.

The CoE have the same rights and obligations as any other user, as stated in the paragraph on the “Terms of access”.

## 2. Tier-0 Systems

**Please note that any of the Tier-0 system may be upgraded during the 1-Year or Multi-Year allocation period. The awarded projects will be given access to the new machine for the remaining part of the budget with appropriate technical support.**

**Fermi – IBM Blue Gene/Q – hosted by CINECA in Casalecchio di Reno, Italy.**

**Details and terms of usage can be found [here](#).**

The IBM BG/Q system Fermi is composed of 10 240 PowerA2 sockets running at 1.6 GHz, with 16 cores each, for a total of 163 840 compute cores and a system peak performance of 2 petaflops. Each processor comes with 16 GB of RAM (1 GB per core).

The total available capacity in this call for Fermi is **390 million** compute core hours.

Fermi is available for 1-year, Multi-Year Project Access and selected CoE.

### **IMPORTANT REMARK:**

Please note that during the allocation period (mid 2016), Fermi will be replaced by the Marconi system. It is recommended that applicants demonstrate that their application codes are able to scale on other architectures. This will be favourably considered for the technical evaluation of the project.

The applicants need to be prepared to move (and adapt) their application codes to the new system during the allocation period. Typically, this means a recompilation. The remaining budget of the project will be transferred to the successor system and if necessary an extension of the allocation period can be considered.

## MareNostrum – IBM System X iDataplex – hosted by BSC in Barcelona, Spain.

Details and terms of usage can be found [here](#).

Mare Nostrum is composed of 2 partitions:

- **MareNostrum** is based Intel Sandy Bridge EP processors 2.6 GHz (eight-core), 2 GB/core (32 GB/node) and around 500 GB of local disk acting as local/tmp. A total of 36 racks, each with 84 compute nodes, each with two Sandy Bridge EP processors. All nodes are interconnected through an Infiniband FDR10 network, with a no-blocking fat tree network topology. MareNostrum has a peak performance of 1.1 petaflops.
- **MareNostrum Hybrid** is composed of 42 nodes with 16 cores, 64 GB of main memory, 2 Xeon Phi processors and two IB FDR10 link per node, for a peak performance of 100 teraflops.

The total available capacity in this call for MareNostrum is:

- On MareNostrum: **120 million** compute core hours
- On the hybrid node partition: **200.000** compute hybrid hours

MareNostrum is available for 1-year, Multi-Year Project Access and selected CoE.

### **IMPORTANT REMARK:**

Please note that during allocation period, MareNostrum III will be replaced by a new system named MareNostrum IV. All applications running in MareNostrum III will also be supported on the newer system and for now the terms of access will be the same as for the existing system.

The applicants need to be prepared to move their application codes to the new system during the allocation period. Typically, this means a recompilation, the remaining budget will be transferred to the successor system and if necessary an extension of the allocation period can be considered.

## 3. Eligibility criteria

Scientists and researchers from around the world can apply for access to PRACE resources.

Only proposals with a civilian purpose will be eligible to participate in PRACE calls for proposals.

Only proposals written in English will be eligible.

PRACE HPC centres may have further restrictions on who is eligible to access their own systems. It is the responsibility of the applicant to ensure that they are eligible to access the system(s) they have applied for. In case of doubts, the applicant is advised to contact the HPC centre(s) for clarifications prior to applying (see contacts at [www.prace-ri.eu/Resources](http://www.prace-ri.eu/Resources)).

### 3.1 Eligibility criteria for Project Access (1-year and multi-year)

#### 3.1.1- Eligibility criteria for academia and public research organisations

Researchers from academia and public research organisations are eligible to apply as long as:

- a) The project leader has an employment contract as a researcher in the organisation
- b) The employment contract of the project leader must be valid for at least 3 months after the end of the allocation period

#### 3.1.2- Eligibility criteria for commercial companies

Commercial companies may apply on their own or in collaboration with academia/public research organisation (as principal investigators or collaborators). Commercial companies are eligible to apply if:

- a) The company has its head office or substantial R&D activity in Europe
- b) The employment contract of the project leader must be valid for at least 3 months after the end of the allocation period
- c) Access is devoted solely for open R&D research purposes
- d) Commercial companies applying on their own will be limited to a maximum of 5% of the total computing resources of a single PRACE system, subject to the approval of the constraints imposed by state-aid regulations

## 4. Terms of access

The Principal Investigator (or Project leader) shall direct the project and is expected to be an essential participant in its implementation. The PI will have the overall responsibility for the management of the project and interactions with PRACE.

The PI commits to:

- a) **Provide** to PRACE within the period established in the Guide for Applicants a final report, using the proper PRACE template, with the results obtained through the access to the PRACE Research Infrastructure, as well as a qualitative feedback on the use of the resources
- b) **Acknowledge** the role of the HPC Centre and PRACE and of the relevant partners involved in the pilot use case for joint data storage in all publications which include the results above mentioned. Users shall use the following (or equivalent) wording in such acknowledgement in all such papers and other publications:

***“We acknowledge PRACE for awarding us access to [resource-name at site]”<sup>1</sup>***»

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<sup>1</sup> Use as many instants of the pattern [resource-name at site] as the number of systems awarded via PRACE. The word ‘site’ can be replaced by ‘BSC, Spain’, ‘CINECA, Italy’, as applicable.  
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Respecting the words in bold above is very important since PRACE will use this word pattern when searching for bibliographic references in scientific articles

c) **Allow** PRACE to publish the mentioned report as of one year from the termination of the allocation period

d) **Collaborate** with PRACE, upon its request, in the preparation of dissemination material

e) **Allow** the relevant partners involved in the pilot use case for joint data storage to publish references to the report as of one year from the termination of the allocation period of HPC resources

Access to PRACE resources is for open R&D research purposes and is free of charge provided that the eligibility criteria and terms of access described herein and in the On-line Application Form are fulfilled/respected. If this differs from the terms of access that the relevant Centre may have in place, it is the terms of access of the relevant Centre that will prevail.

Users will hold harmless PRACE and the relevant Centre, including their Directors and staff, from and against any claim and expense arising out of the use of the resources.

From the start to the end of the access period, the applicant should direct questions and requests for support to the user support of the HPC Centre(s) where resources have been allocated.

Applicants must inform promptly the peer review team ([peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu)) and the centre where the resources are allocated of any changes to a successful proposal, namely a decrease in the amount of resources needed or on the distribution of the usage of the resources within the agreed time plan with the centre.

Requests for the extension of the allocation period need to be fully justified, and sent to the HPC centre where the resources are allocated. They will be analysed by PRACE on a case by case basis. Extension will only be considered in the event of unforeseen technical issues at the HPC hosting site which would prevent the user from accessing the awarded HPC resources. The awarded resources (total computer time) cannot be increased.

## 5. Process details and deadlines

### 5.1- How to Apply

**All proposals must be submitted via the PRACE website at:** <https://prace-peer-review.cines.fr/>

**All proposals must be fully completed and submitted by the closing date.** The submission website will not accept applications that are submitted after this time. In the case of technical difficulties, the decision of PRACE as to whether an application can be accepted is final.

However, Applicants are advised to make sure that they submit proposals as early as possible before the given deadline in order to ensure that all mandatory fields are completed and submission is accepted.

Further details on the standard application procedure can be found on the [PRACE website](http://www.prace-ri.eu) (“How to Apply” <http://www.prace-ri.eu/application-guide/>).

### **5.1.1- Applications for 1-year and Multi-Year Project Access**

**All proposals for 1-year and Multi-Year Project Access consist of 2 documents:** an on-line form and a “Detailed Project Document”, both available via the above mentioned website.

**All mandatory fields of the on-line application form must be completed** before it can be submitted. After the form has been saved, applicants can continue to access it and update it before they finally submit it. Once an application has been submitted no more changes can be made, unless the applicant un-submits the proposal, performs all necessary changes, saves the changes, and re-submits the proposal. Each time the applicant submits or un-submits the proposal, he/she will receive an e-mail with the status of the proposal (un-submitted or submitted). Please note that only submitted proposals will be put forward for peer-review.

The template of the compulsory “*Detailed Project Document*” of the proposal (pdf to be attached to the online application form) must be carefully respected (Headings, Length of Paragraphs, Tables and Figures). Proposals that do not follow the template or that are incomplete cannot be considered for peer-review. The PRACE support team is available to answer questions by email while the Call is open ([peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu)).

**For proposals requesting access as a follow-up to a previous project access, it is mandatory to present a final or progress report of the previous access at the time of the closure of the current Call.** This report should be sent to the PRACE peer-review team at [peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu) by the Call deadline date. The report will be analysed by the scientific reviewers and Access Committee members to evaluate the status of the on-going access and whether the need for the follow-up project is acceptable or not.

The template document for this report is available on the [PRACE website](http://www.prace-ri.eu) (“Information for PRACE Awardees”), or on request to [peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu), and must be carefully respected.

### **5.2- Peer Review assessment procedure**

The assessment procedure (referred as peer review process) abides to the PRACE peer-review principles stated on the [PRACE website](http://www.prace-ri.eu) (“Peer-Review”).

From **12 to 19 November 2015**, the PRACE Peer-Review Team will perform an administrative check. Proposals not complying with PRACE eligibility criteria will be rejected at this stage.

From **19 November 2015 onwards**, the proposals will be technically and scientifically peer-reviewed by recognised experts.

From **18 to 22 January 2016**, during the right to reply phase, applicants are strongly recommended to use the opportunity to comment on these assessments.

The reviewers' reports and the applicants' responses will be analysed by the Prioritisation Panel who will produce the final ranking list. In case of conflicting reviews and responses, the Prioritization Panel will analyse the proposal.

Proposals will be awarded by moving down the ranking list in order until resources run out. If necessary, the Prioritisation Panel may agree on a scientific quality cut-off threshold. Proposals ranked under this threshold will not be awarded even if there are resources available on the systems.

By the **first week of March 2016**, all applicants can expect to be notified of the outcome although efforts will be made to notify successful applicants as soon as possible.

### *5.2.1- Criteria for assessment*

Only fully completed proposals will be subject to the hereinafter peer-review evaluation process.

#### *5.2.1.1- Technical review*

It is essential that proposals submitted are at a high level of technical maturity and demonstrate the need for Tier-0 resources. Further details on the minimal requirements for using each Tier-0 system are available on the [PRACE website](#) ("Call Announcement" page – document titled 'Technical Guidelines for Applicants to PRACE 12<sup>th</sup> Call (Tier-0)').

The computer codes used during the project should have been previously tested and a high level of scalability and development must be demonstrated. These computer codes must be ready to run on Tier-0 systems.

#### *5.2.1.2- Scientific review*

Successful proposals must demonstrate scientific excellence and focus on topics of major relevance for European research explaining the novelty, transformative aspects and expected scientific impact, and must include a dissemination plan. The results of the project should lead to committed publication in one or more high-quality journals and conferences.

The identification of possible practical and timely applications resulting from the project is desirable and must be made clear in the application.

The scientific review assessment form is available to applicants and can be downloaded from the [PRACE website](#) (see documents at bottom of the page with title "Information for reviewers" <http://www.prace-ri.eu/information-for-reviewers/>).

## **Terminology**

*Core hour*: Elapsed time (wall clock time) in which a core is allocated to the user.

*GPU hour*: Elapsed time in which a graphical processing unit (GPU) is allocated to the user.

*Hybrid hour*: Elapsed time in which a co-processor unit is allocated to the user.

## **Contacts**

For any queries related to applications, please contact: [peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu)