



## PRACE 18th Call for Proposals for Project Access

### Important Dates:

Opening date:	<b>04/09/2018</b>
Closing date:	<b>30/10/2018, 10:00 CET</b>
Applicants' reply to scientific reviews:	<b>January 2019</b>
Submission of a progress/final report for continuation projects	<b>07/12/2018 @ 10.00 CET</b>
<b>Communication of allocation decision:</b>	<b>End of March 2019</b>
Allocation period for awarded proposals:	<b>02/04/2019 – 01/04/2020</b>
Type of Access	<b>Project Access and Multi-Year Project Access</b>

### PRACE systems available:

System	Architecture	Site (Country)	Core Hours (node hours)	Minimum request
<b>Joliot Curie - SKL</b>	BULL Sequana X1000	GENCI@CEA (FR)	142 million (3 million)	15 million core hours
<b>Joliot Curie - KNL</b>	BULL Sequana X1000	GENCI@CEA (FR)	101 million (1.5 million)	15 million core hours
<b>JUWELS</b>	BULL Sequana X1000	GCS@JSC (DE)	70 million (1.5 million)	35 million core hours
<b>Marconi-Broadwell</b>	Lenovo System	CINECA (IT)	36 million (1 million)	15 million core hours
<b>Marconi-KNL</b>	Lenovo System	CINECA (IT)	610 million (9 million)	30 million core hours
<b>MareNostrum</b>	Lenovo System	BSC (ES)	240 million (5 million)	30 million core hours
<b>Piz Daint</b>	Cray XC50 System	ETH Zurich / CSCS (CH)	510 million (7.5 million)	68 million core hours Use of GPUs
<b>SuperMUC-NG*</b>	Lenovo ThinkSystem	GCS@LRZ (DE)	125 million (2.2 million)	35 million core hours

\*Please note that SuperMUC-NG will not start operating until Q1/2019. For Call 18, scaling data on a Skylake based system (e.g. Joliot-Curie) will be accepted for the technical evaluation.

### Pilot Phase from the European ICEI project (Fenix Research Infrastructure):

This call includes the opportunity to benefit from resources by the European ICEI project, contributed as a Pilot Phase.

## Introduction

The Partnership for Advanced Computing in Europe (PRACE) is an international non-profit association (aisbl) 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 achieve this mission by offering 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 Horizon 2020 Research and Innovation Programme (2014-2020) under grant agreement 730913.

The computer systems (called Tier-0 systems) and their operations that are accessible through PRACE are provided for this 18th call by 5 PRACE hosting members: BSC representing Spain, CINECA representing Italy, ETH Zurich/CSCS representing Switzerland, GCS representing Germany and GENCI representing France.

Scientists and researchers 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 (**Single-year Projects**), or, on a 24- or 36-months schedule (**Multi-year Projects**). The allocation of awarded resources is made 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 European Commission under the E-INFRA-5-2015 call for proposals.

\*includes a Pilot Phase from the European ICEI project (Fenix Research Infrastructure)

The PRACE Access Committee, composed of leading international scientists and engineers, ranks the proposals received and produces a recommendation to award PRACE resources based on scientific and technical excellence.

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 18th 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 properly tested, and that demonstrate either high performance and scalability on the PRACE systems requested or a need for ensemble simulations that require a very large amount of CPU time overall. The focus should be on approaches (parallelization, architectures and software) and memory requirements that should be justified in terms of time-to-solution and the suitability of the hardware requested, e.g. the fraction of peak performance that can be attained.

The need for PRACE Tier-0 computing performance must be clearly spelled out in the proposal.

Further details on the **minimal requirements** for using each system are available in the *“Technical\_Guidelines\_for\_Applicants”* document which can be found on the [PRACE website](#).

**Proposals for code testing and optimisation are outside of the scope of this call.** A separate call for **Preparatory Access** is continuously open for such purposes (see 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 should be published in high impact peer reviewed scientific journals and conferences (please see **Section 4 Terms of Access**).

**Resources can be requested on a single system, or on more than one system when justified.** Please request resources on more than one system only if your project proposal needs an additional system; **do not request resources on more than one system as alternative(s) to the preferred system.** It is strongly recommended that your production code is tested in the requested machine (it is mandatory to test the code if applying to Piz Daint at ETH Zurich/CSCS). Following the recommendation of the PRACE Access Committee and availability of resources, proposals may be awarded in their entirety, awarded with a reduced scope or rejected.

Please respect the minimum request for each system listed on Page 1; **proposals that do not respect this will be administratively rejected.**

## 1.1. Projects Access

**Project Access** provides access to PRACE Tier-0 computing resources for projects that use codes that have been previously tested and have demonstrated high scalability and optimisation in the systems requested.

**Proposals for Project Access must be based on computer codes and data ready to run on the Tier-0 systems from the start of the allocation. The need for Tier-0 resources must be demonstrated.**

Applicants requesting access as a **follow-up to a running or finished PRACE Project Access** have to present the corresponding **progress or final reports, following the templates available on the PRACE website** (“Information for PRACE Awardees”). The PRACE Access Committee will use them to evaluate the status of the on-going access and whether the need for the follow-up project is recommended or not.

### **1.1.1- Single-Year Project Access**

Allocations for standard Single-year Access will start on **2<sup>nd</sup> of April, 2019** for a period of **12 months**, until **1<sup>st</sup> of April, 2020**.

### **1.1.2- Multi-Year Project Access**

This PRACE 18th Call for proposals is open to Multi-Year Project Access also, inviting applications for 2 or 3-year projects. Multi-Year Project Access is subject to the same eligibility and assessment criteria as applications for standard Single-year Project Access. In addition, proposals must 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 2<sup>nd</sup> and/or 3<sup>rd</sup> year. **All Multi-year Access Projects are subject to annual peer review, based on a progress report and a presentation by the project Principal Investigator (PI) (or Project Leader) to the PRACE Access Committee. Allocation of resources shall be adjusted accordingly, based on the amount of resources requested in the proposal, the resources effectively used, and the amount of resources (and systems) available in the Call(s) corresponding to the 2<sup>nd</sup> and/or 3<sup>rd</sup> year.**

Future calls will reserve 10% of the resources for multi-year projects awarded in previous calls. PRACE Access Committee will decide how this reserve is distributed among the existing multi-year projects.

## **1.2. Support to CoE**

0.5% of the total resources available for this call is reserved for CoE as selected by the European Commission, under the E-INFRA-5-2015 and INFRAEDI-02-2018 calls for proposals. Resources will be equally distributed among the 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.

CoE will be directly informed about the process and requirements to access these resources.

The CoE will have the same rights and obligations as any other user, as stated in Section 4 (Terms of Access).

## **1.3. Resources from the European ICEI project (Fenix research infrastructure) – Pilot Phase**

This 18<sup>th</sup> Call includes as well a pilot phase to incorporate a fraction of the resources from the Fenix Research Infrastructure, funded by the European ICEI project (<https://fenix-ri.eu/>). Applicants to this

call may additionally request for allocation of compute and storage resources provisioned by the European ICEI project. More information on the resources that are expected to be available through ICEI can be found in the table below. Applicants interested in using the additional ICEI resources are requested to fill in the corresponding annex in the “Project Scope and Plan” document, providing the following information:

- Amount of required ICEI resources
- Description of the software and services that are planned to be executed within the ICEI infrastructure
- Description of special needs, e.g. in terms of third-party software

The following table summarises the amount of resources planned to be available during the allocation period of this 18<sup>th</sup> Call. While the resources at ETH Zurich/CSCS will be available from the beginning, other resources will only become available later in 2019.

Component	Site (Country)	Total ICEI (100%)	PRACE (15%)	Minimum request	Resources for Call 18	Unit
<b>Scalable computing services</b>						
Piz Daint Multicore	CSCS (CH)	250 nodes	38 nodes	1 node	279224	node hours
<b>Interactive computing services</b>						
ICCP@JUELICH	JSC (DE)	175 nodes	26 nodes	1 node	142350	node hours
Interactive Computing Cluster	CEA (FR)	60 nodes	9 nodes	1 node	2592	node hours
Piz Daint Hybrid	CSCS (CH)	400 nodes	60 nodes	1 node	446760	node hours
T.B.D.	CINECA (IT)	350 nodes	50 nodes	1 node	218400	node hours
T.B.D.	BSC (ES)	6 nodes	1 node	1 node	2904	node hours
<b>VM services</b>						
ICCP@JUELICH	JSC (DE)	25 nodes	4 nodes	1 VM	64	# VMs
Openstack compute node	CEA (FR)	600 VM (20 nodes)	90 VM (3 nodes)	1 VM	90	# VMs
Pollux Openstack compute node	CSCS (CH)	35 nodes	5.25 nodes	1 VM	294	# VMs
Nord3	BSC (ES)	84 nodes	12.60 nodes	1 node		nodes
<b>Archival data repositories</b>						
Archival	CEA (FR)	7000 TB	1050 TB	0	1050	TByte
Archival Data Repository	CSCS (CH)	4000 TB	600 TB	1 TB	600	TByte
T.B.D.	CINECA (IT)	5000 TB	750 TB	1 TB	750	TByte
T.B.D.	BSC (ES)	6000 TB	900 TB	1 TB	900	TByte
<b>Active data repositories</b>						
HPST@JUELICH	JSC (DE)	1 PB	150 TB	10 TB	912.50	Tbyte*day
Lustre Flash	CEA (FR)	800 TB	120 TB	1 TB	108	Tbyte*day
Data Warp	CSCS (CH)	80 TB	12 TB	1 TB	12	Tbyte*day
T.B.D.	CINECA (IT)	350 TB	50 TB	1 TB	50	Tbyte*day
T.B.D.	BSC (ES)	70 TB	10.50 TB	1 TB	10.50	Tbyte*day

Further details on the components can be found in section 2.

## 2. Tier-0 Systems

The PRACE HPC Tier-0 systems available for the 18th Call are:

- |                                 |                     |                     |
|---------------------------------|---------------------|---------------------|
| • “ <b>JOLIOT CURIE - SKL</b> ” | Bull Sequana system | (GENCI@CEA, France) |
| • “ <b>JOLIOT CURIE – KNL</b> ” | Bull Sequana system | (GENCI@CEA, France) |
| • “ <b>JUWELS</b> ”             | Bull Sequana system | (GCS@JSC, Germany)  |
| • “ <b>Marconi</b> ”            | Lenovo System       | (CINECA, Italy)     |
| • “ <b>MareNostrum 4</b> ”      | Lenovo System       | (BSC, Spain)        |
| • “ <b>Piz Daint</b> ”          | Cray XC50 System    | (CSCS, Switzerland) |
| • “ <b>SuperMUC-NG</b> ”        | Lenovo ThinkSystem  | (GCS@LRZ, Germany)  |

All systems are available for Single-Year Access, Multi-year Access and CoE.

- **JOLIOT CURIE** – Bull Sequana system – hosted by GENCI in TGCC/CEA, Bruyères-Le-Châtel, France.  
Details and terms of usage can be found [here](#).

The successor of Curie, **JOLIOT CURIE** is a BULL Sequana X1000 system based on 9 compute cells integrated into 2 partitions:

- The **SKL** partition is composed of 6 cells, each containing 272 compute nodes with two 24-core Intel Skylake 8168 processors 2.7 GHz, 4 GB/core (192 GB/node). These 6 cells are interconnected by an Infiniband EDR 100 Gb/s high speed network.
- The **KNL** partition is composed of 3 cells each containing 276 nodes with one Intel Knights Landing 68-core 7250 1.4 GHz manycore processor with 16 GB of high-speed memory (MCDRAM) and 96 GB of main memory. These 3 cells are interconnected by a BULL BXI 100 Gb/s high speed network. A KNL node provides 64 cores for user jobs and keeps 4 cores for the system. A node is configured in quadrant for the cluster node and in cache mode for the memory. The threadmultiple mode for the hybrid program is not yet supported.
- This configuration is completed with 5 fat nodes for pre/post processing (3 TB of memory each and a fast local storage based on NVMe) and 20 hybrid nodes used for remote visualisation.
- These resources are federated across a multi-layer shared Lustre parallel filesystem with a first level (/scratch) of more than 5 PB at 300 GB/s.

The peak performance of this system is 9 petaflops.

The total available capacity in this call for **JOLIOT CURIE SKL** is **142 million** compute core hours. The total available capacity in this call for **JOLIOT CURIE KNL** is **101 million** compute core hours.

Requests below **15 million compute core hours** will not be considered.

- **Marconi** – Lenovo NeXtScale – hosted by CINECA, Italy.  
Details and terms of usage can be found [here](#)

Marconi system consists of three partitions, from which two will be available for Call 18:

- **Marconi – Broadwell** (A1 partition) consists of 10 Lenovo NeXtScale racks with 72 nodes per rack. Each node contains 2 Broadwell processors each with 18 cores and 128 GB of DDR4 RAM<sup>1</sup>.
- **Marconi – KNL** (A2 partition) consists of 3600 Intel server nodes integrated by Lenovo. Each node contains 1 Intel Knights Landing processor with 68 cores, 16 GB of MCDRAM and 96 GB of DDR4 RAM.

The nodes of both A1 and A2 partitions are connected via Intel Omni-Path network.

The aggregate peak performance of this system is more than 20 petaflops.

The total available capacity in this call for **Marconi** is:

- On **KNL** partition: **610 million** compute core hours ( 9 million of KNL node hours)
- On **Broadwell** partition: **36 million** compute core hours (1 million of BDW node hours)

Requests below **15 million compute core hours** on the Broadwell partition, or below **30 million compute core hours** on the KNL partition will not be considered.

- **MareNostrum** – Lenovo System – hosted by BSC in Barcelona; Spain.  
Details and terms of usage can be found [here](#).

**MareNostrum 4** consists of 48 Compute Racks with 72 compute nodes per rack. Each node has two Intel Xeon Platinum 8160 next generation general purpose Xeon E5 processors with 2.1 GHz, 24 cores per socket (48 cores/node) and 96 GB of main memory (2 GB/core), connected via Intel Omni-Path fabric at 100 Gbits/s.

There are a subset of 200 fat nodes available that have 384 GB of main memory (8 GB/core).

**Their use is restricted to a maximum of 50% of their hours for all projects combined during each PRACE call.** The total available capacity for **MareNostrum 4** in this call is **240 million compute core hours**.

Requests below **30 million compute core hours** will not be considered.

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<sup>1</sup> Marconi system will be upgraded in 2019. This upgrade will affect particularly the Broadwell partition. After this upgrade the network infrastructure of this partition could be different.

- **Piz Daint** – Cray XC50 System – hosted by CSCS in Lugano, Switzerland. Details and terms of usage will be made available [here](#).

Named after Piz Daint, a prominent peak in Grisons that overlooks the Fuorn pass, this supercomputer is a hybrid Cray XC50 system and is the flagship system for national HPC Service. Piz Daint has compute nodes Intel® Xeon® E5-2690 v3 @ 2.60GHz (12 cores, 64GB RAM) and NVIDIA® Tesla® P100 16GB. The nodes are connected by the "Aries" proprietary interconnect from Cray, with a dragonfly network topology.

The total available capacity in this call for Piz Daint is **7.5 million** compute node hours (**510 million** compute core hours).

Requests below **1 million compute node hours (68 million compute core hours)** and where the usage of GPU accelerators is not proven will not be considered. Please note that all technical data on Piz Daint must be provided in node hours.

- **SuperMUC-NG** – Lenovo ThinkSystem – hosted by GCS in LRZ, Garching, Germany. Details and terms of usage will be made available [here](#)

SuperMUC-NG will start operation in Q1/2019. It will provide 6 480 Lenovo ThinkSystem dual socket nodes equipped with 24 core Intel Skylake EP processors and 96 GB of main memory. A subset of 144 fat nodes will be equipped with 768 GB of main memory. The nodes are connected via a fat-tree Omni-Path network. The Peak Performance will be at 26.7PF.

The total available capacity in this call for SuperMUC-NG is **125 million** compute core hours.

Requests below **35 million compute core hours** will not be considered.

- **JUWELS** - Bull Sequana system hosted by GCS in JSC, Jülich, Germany. Details and terms of usage will be made available [here](#)

JUWELS (Jülich Wizard for European Leadership Science) is designed as a modular system. The JUWELS Cluster module, supplied by Atos, based on its Sequana architecture, consists of about 2500 compute nodes, each with two Intel Xeon 24-core Skylake CPUs and 96 GiB of main memory. The compute nodes are interconnected with a Mellanox EDR InfiniBand interconnect. The peak performance of this CPU based partition is 10.4 petaflops. A booster module, optimized for massively parallel workloads, is currently scheduled for the beginning of 2020.

The total available capacity in this call for the JUWELS is **70 million** compute core hours.

Requests below **35 million compute core hours** will not be considered.



**IMPORTANT REMARKS:**

- Please note that any of the Tier-0 systems **may be upgraded** during the Single-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.
- Please ensure that the core hour consumption is regular throughout the allocation period, or provide a requested schedule after consultation with the centres.

- **Fenix Research Infrastructure** – *The following components are offered in this 18<sup>th</sup> call under a first pilot phase from the European ICEI project*

*Components by France (CEA)*

IC: Linux servers with 8GB/core

VM: Linux single processor server with 4GB or memory

Active Repository: POSIX Lustre filesystem based on SSD technologies

Archive Repository: Object store

All the compute resources (IC & VM) will be able to access the data repositories present in the TGCC. The TGCC policies on data, account, security and usage will apply to these resources. IC resources will be allocated for interactive usage (not through a batch system) but access request may be queued when all resources will be in-use.

*Components by Germany (JSC)*

ICEI-ICCP: Compute cluster for interactive workloads and VM hosting. The node design will be HPC-focused (likely dual-socket CPUs with fully utilized memory channels). The nodes in the cluster will be interconnected with a high-speed interconnect and will access JSC's central storage infrastructure. The cluster and VM hosting partition share the same underlying hardware. The VMs can host long running services. Security restrictions regarding access to other facility services apply. The hosted VMs do not have access to the high-speed interconnect but can natively access selected subsets of JSC's storage offerings with limitations regarding access and modification permissions.

HPST: NVM-based I/O acceleration platform. The HPST will enable applications to obtain high read and write performance (streaming and small-block size I/O) with moderate workload scalability. The HPST will be accessible from the cluster part of the ICCP system as well as the JUWELS PRACE Tier-0 resource.

*Components by Italy (CINECA)*

Interactive Computing: GNU/Linux nodes based on Intel Technology (Intel Broadwell 2x Intel Xeon E5-2697 v4), 256 GB RAM and partially equipped with GPU Cards (NVIDIA P100 or V100)

Active Repository: GPFS based high performance file system

Archive Repository: Object Store accessible through SWIFT protocol using IBM Spectrum Scale technology

VM: Cloud Computing facility providing VMs up to 128GB, 40 vCPU each. Access to data repositories will be provided either through NFS or SWIFT protocols.

### *Components by Spain (BSC)*

Nord3: Intel Sandybridge cluster being able to be used as VM host or scalable cluster.

8 idataplex racks, each with 84 nodes dx360m4. Each node has next configuration:

2x Intel SandyBridge-EP E5-2670/1600 20M 8-core at 2.6 GHz and 32 GB RAM

Interactive computing cluster: Nodes for interactive access with dense memory

Active Storage: GPFS Storage accessed from HPC clusters

Archive Storage: HSM system with Object storage interface

### *Components by Switzerland (CSCS)*

Piz Daint is a Cray System XC40/XC50

Interactive Computing: XC50 Compute Nodes Intel® Xeon® E5-2690 v3 @ 2.60GHz (12 cores, 64GB RAM) and NVIDIA® Tesla® P100 16GB

Scalable Computing: XC40 Compute Nodes Two Intel® Xeon® E5-2695 v4 @ 2.10GHz (2 x 18 cores, 64/128 GB RAM)

VM: Dual-socket Linux server with 512 GB RAM

Active Repository: Data Warp (plus the Scratch FileSystem with no quota)

Archive Repository: Object store SWIFT

## **3. Eligibility criteria**

Scientists and researchers from academia and industry 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.

Double-awarding is not allowed; proposals already granted in any other HPC programme will be rejected.

As resources will be provided under the PRACE 2 Programme in which restrictions apply, we strongly urge applicants to be aware that:

- a. proposals requesting resources on several systems have lower chances of receiving the expected allocations, especially when this resource distribution is a requirement for their project; conversely, applicants providing technical evidence that their project can accommodate being awarded on other systems than the one(s) requested raise the chances of their project being awarded;
- b. applicants based in countries not contributing to the PRACE 2 Programme (see [PRACE website](#)) are invited to collaborate with Principal Investigators based in contributing countries; even though this is not an exclusion criterion, applicants raise their chances of being awarded by teaming up this way.

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 <http://www.prace-ri.eu/prace-resources/>).

### 3.1 Eligibility criteria for Project Access (Single-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 at the time of proposal submission.
- 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 organisations (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 is valid when the proposal is submitted and 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 lead 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. Please make sure that the contact details for the PI are consistent in the different forms to be completed and that **all e-mail addresses used are professional e-mail addresses**.

The usage of PRACE resources needs to be acknowledged for all data produced through PRACE allocations, both in publications and when depositing the data to other infrastructures.

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 wording in such acknowledgement in all such papers and other publications:

**“We acknowledge PRACE for awarding us access to [resource-name hosted by at site]”**

Use as many instances of the pattern [resource-name hosted by at site] as the number of systems awarded via PRACE. Please follow these examples:

- JOLIOT CURIE at GENCI@CEA, France
- Marconi at CINECA, Italy
- MareNostrum at Barcelona Supercomputing Center (BSC), Spain
- Piz Daint at CSCS, Switzerland
- SuperMUC-NG at GCS@LRZ, Germany
- JUWELS at GCS@JSC, Germany

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) **Contribute** to PRACE dissemination activities, including active participation in the annual PRACE Scientific and Industrial Conference (PRACEdays) and presentations at the PRACE booth at other HPC events. Selected awardees are expected to contribute to and attend such events at least once over the two year period starting from the end of the allocation period. Awardees will also be expected to reply favourably when asked to be interviewed for PRACE publications and/or send visualisations or other materials for promotional purposes.

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 online 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 not hold liable PRACE or the relevant Centre, including their Directors and staff, with regard to 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 office ([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. Extensions 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.

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/application-guide/) (“How to Apply” <http://www.prace-ri.eu/application-guide/>).

#### 5.1.1- Applications for Single-year and Multi-Year Project Access

All proposals for Single-Year and Multi-Year Project Access consist of 2 parts: an online form and the “Project scope and plan”, both available at <https://prace-peer-review.cines.fr/>.

The template of the “Project scope and plan” (Please save it as pdf to be attached to the online application form) must be carefully respected (Headings, length, tables and figures). **Proposals that do not follow the template or that are incomplete will be administratively rejected and will not be further evaluated.** The PRACE peer review team is available to answer questions by email while the Call is open ([peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu)).

**All mandatory fields of the online 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.**

Proposals requesting access as a **follow-up to a running/completed Project Access** have to submit a [progress/final report](#) of the project by 07<sup>th</sup> of December 2018 @ 10.00 CET latest. These reports need to be sent to the PRACE peer review team ([peer-review@prace-ri.eu](mailto:peer-review@prace-ri.eu)).

PRACE Access Committee will use these reports to determine if a follow-up project is recommended or not.

The **template** document for these reports are **available on the [PRACE website](#)** (“Information for PRACE Awardees”) and it must be **carefully respected**.

## 5.2- Peer Review assessment procedure

The assessment procedure (peer review process) abides to the PRACE peer review principles stated on the [PRACE website](#) (“Peer Review”). The peer review process encompasses 4 phases.

**Administrative check (phase I).** Proposals not complying with PRACE eligibility criteria will be rejected at this stage and will not continue to the next phase.

**Technical Assessment (phase II).** Proposals will be technically reviewed by technical experts of PRACE Hosting Member sites. During this phase, **applicants may be contacted by technical experts in case of questions or concerns raised during the review.**

**Scientific Assessment (phase III).** Proposals will be peer reviewed by recognised independent scientific experts. Individual reports will be made available to applicants. Applicants are strongly recommended to use the opportunity to comment on these assessments during the right to reply period.

**Access Committee Assessment (phase IV).** The reviewers’ reports and the applicants’ responses will be analysed by the PRACE Access Committee who will produce the final ranking list. The Access Committee 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 **end of March 2019**, all applicants can expect to be notified of the outcome.

### 5.2.1- Criteria for assessment

Only fully completed proposals will be subject to the 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](#) (document titled ‘**Technical Guidelines for Applicants**’).

Technical reviewers are asked to evaluate:

1. Application performance and scalability on the PRACE systems required. The focus should be on time-to-solution, efficiency of the solution for the scientific problem, as well as overall resource utilization, in addition to strong and weak scaling. There should be explicit comparisons with relevant codes in each scientific domain in terms of time-to-solution, percentage of peak, and weak and strong scalability for the sizes that are to be performed in the projects.

2. Suitability of the requested PRACE platform.

3. Whether or not the applicant provides a suitable breakdown of the resources requested to carry out the simulations.
4. Whether or not the resource request is consistent with the simulations proposed in the project plan.

**During the technical review, technical experts may contact the applicants in case of questions or concerns raised during the review.**

#### *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. A dissemination plan should also be included. The results of the project should be published in high-quality journals and conference papers.

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

The scientific reviewers are particularly asked to evaluate:

1. The significance of the proposed research for the solution of challenging scientific and societal problems.
2. The soundness of numerical methods, algorithms and computational tools. Reviewers must specify the strengths and weaknesses of the proposed research. They must include comparisons with respect to the state-of-the-art in the field in terms of computing, methodology and expected outcomes.
3. The appropriateness of project timeline and resources (Is the project plan realistic, are requested resources sufficient and fully justified, is a Tier-0 system/allocation necessary?).
4. If the requested resources are justified and if a reduction can be made.
5. If the research plan is realistic within the given time and resources requested.
6. The qualifications, expertise and track record of the PI and team (Does the background and experience of the PI and her/his team make a successful outcome of the project likely?).
7. In the case of continuation of finished projects, the reviewers will be asked to review the added value of the new project and the advances over the previous one.
8. The provided dissemination plan of the results in scientific journals and conferences.

The [scientific review assessment form](#) is available to applicants and can be downloaded from the [PRACE website](#) (see documents at bottom of the page).

## 6. Tips and examples

This section includes a few tips and examples of common mistakes or misunderstandings in the preparation and submission of proposals:

- a) **Submission deadline.** A research team faces last-minute problems, not related to the submission system, in the submission of their proposal and is not able to submit it completely before the deadline. *The application is not considered for the current call.*
- b) **Submission completeness.** An application is received incomplete, i.e.: missing documents or documents with missing sections. *The application is administratively rejected, and it will not be evaluated.*
- c) **Application exceeding limits.** A research team submits a proposal exceeding the page limits. *The exceeding pages will not be considered as part of the application.* Reviewers will be instructed not to consider the exceeding pages, and this may even imply that the application is administratively rejected.
- d) **Minimum allocation of resources.** A research team estimates that 54 million core hours are needed to develop their project. In the application, they introduce “54”, instead of 54,000,000. *The application is administratively rejected, since the request is under the minimum allocation of the desired PRACE system.*
- e) **Technical readiness.** A research team submits an application lacking the scalability data of their codes, assuming that they will be able to provide this data during the evaluation of their proposal. *The application is administratively rejected, since this data is mandatory at the time of submission.*
- f) **Technical data.** A research team uses their local HPC system to prepare the benchmarks required to support the request of resources. This system is somehow related but not completely representative of the PRACE system requested. *There is a risk that the application is technically rejected, depending on the architecture used and the criteria of the technical reviewers, whose decision is final.*
- g) **Multi-year allocations.** A research team is preparing a project that will consume 300 million core hours during three years. The application is submitted as a multi-year project, requesting 100 million core hours for each year. *There is a risk that the second and/or third year cannot be granted, since there is a limit to up to 10% of the resources of the system for multi-year projects (from 10 million to 60 million core hours, depending on the system). This kind of projects are encouraged to prepare and submit follow-up single-year applications, which would allow them (if successful) to concatenate allocations.*



## 7. Terminology

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

*Node hour*: Elapsed time (wall clock time) in which a computing node is allocated to the user.

## 8. Contacts

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