





PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE

**PRACE aisbl, a persistent pan-European
supercomputing infrastructure**

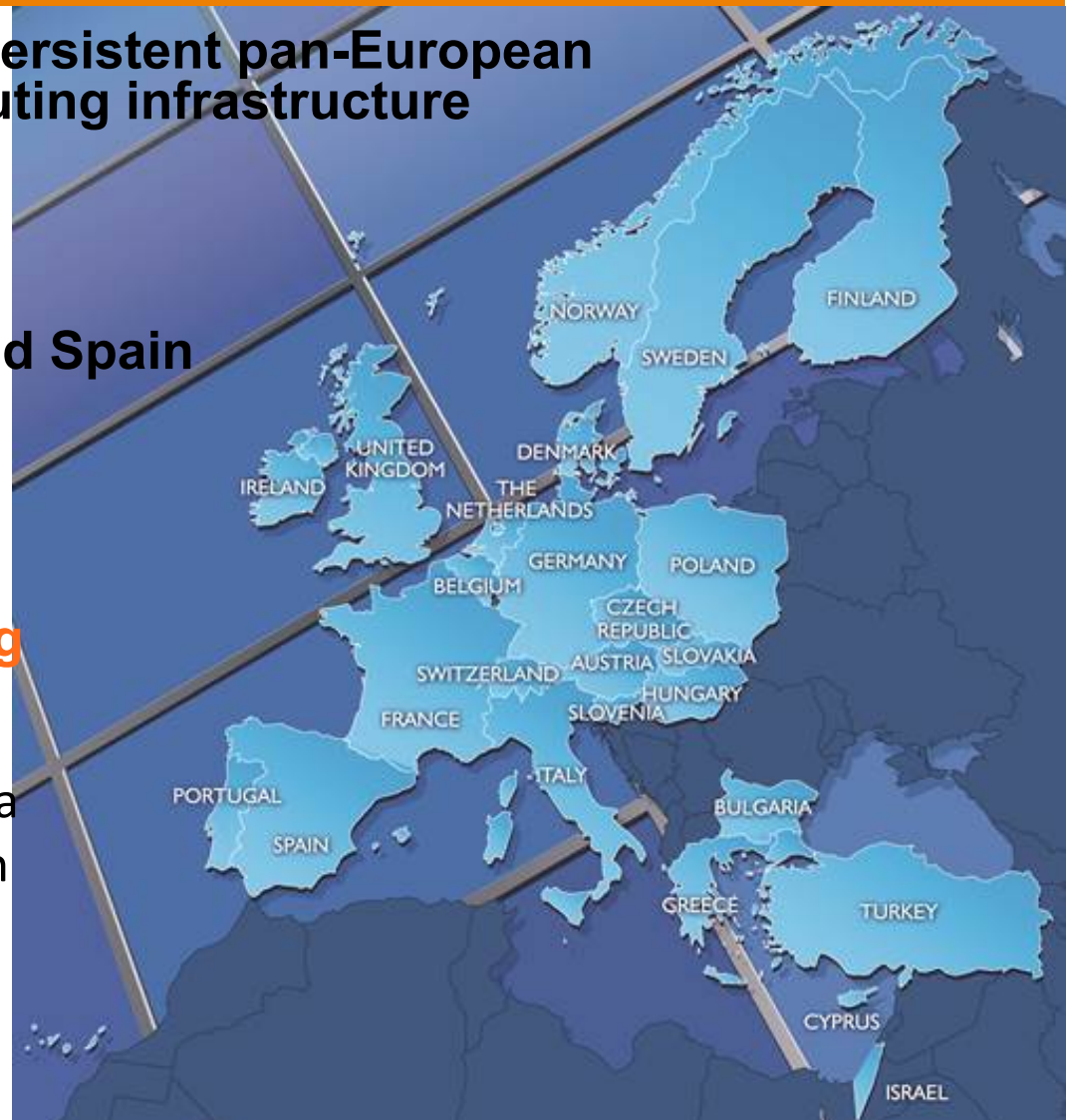
25 members

**4 hosting members:
France, Germany, Italy and Spain**

**Enables world-class science
through **large scale
simulations****

**Offers HPC services on **leading
edge capability** systems**

**Awards its resources through a
single and **fair** pan-European
**peer review process for
open research****





PRACE at a glance, HPC services in Europe

530 M€ of funding for the **2010-2015** period

25 member states, including **4 Hosting Members**
(France, Germany, Italy, Spain)

346 scientific projects **enabled**

>9 billion core hours awarded
since 2010 with peer review ,
scientific excellence as the main
criteria

15 Pflop/s of peak performance on **6 world-class systems**

Open R&D access for **industrial users**

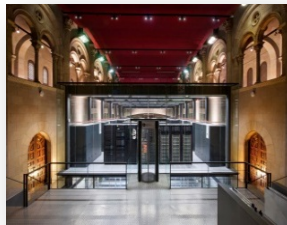
≈3000 people trained by **6 PRACE Advanced
Training centers** and others events



PRACE's awards in 4 years

346 projects and 9.2 thousand million core-hours awarded

MareNostrum: IBM
BSC, Barcelona, Spain



JUQUEEN: IBM
BlueGene/Q
GAUSS/FZJ
Jülich, Germany



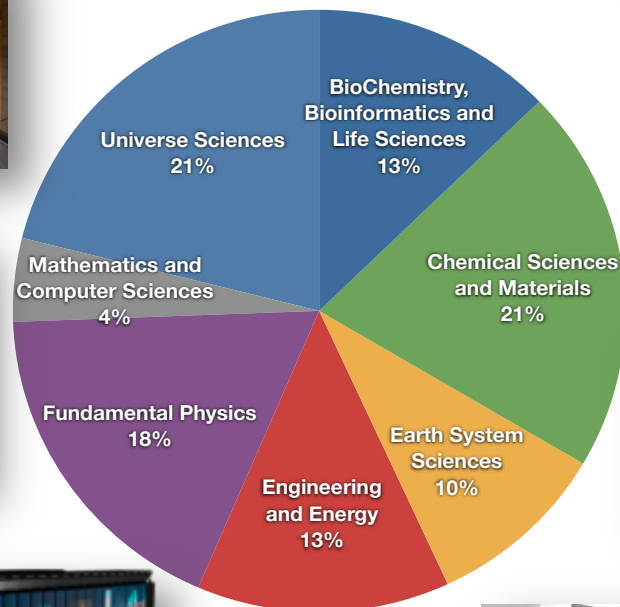
SuperMUC: IBM
GAUSS/LRZ
Garching, Germany



FERMI: IBM BlueGene/Q
CINECA, Bologna, Italy



HORNET: Cray
GAUSS/HLRS,
Stuttgart, Germany





Industrial Advisory Committee (IAC)

- The IAC is composed of European industry representatives (from multi-nationals & SMEs)
- It is representing 11 industrial sectors:

Domain	Company
Aeronautics/Aerospace	Airbus, France
Automotive/Transport	Daimler, Germany
Energy	EDF, France
Materials/Chemistry	BASF, Germany
Engineering/Manufacturing	Termo fluids, Spain
Oil & Gas	ENI, Italy
Renewable Energy	Vestas, Norway
Telecommunications/Electronics	NXP Semiconductors, The Netherlands
ISV	NAFEMS, United Kingdom
Life Sciences/Pharmaceutics	Sanofi, France
HPC Vendors	HTP4HPC
Finance/Insurance	N.N.

- IAC provides PRACE with advice on HPC usage for the benefit of European competitiveness and economic growth.



Scientific Steering Committee (SSC)

- It is composed of European leading researchers that are responsible for advice and guidance on all matters of a scientific and technical nature which may influence the scientific work carried out by the use of the Association's resources.
- The SSC includes scientists from diverse areas:
materials science, universe sciences, environmental science, particle physics, computational earth sciences, life sciences, plasma physics, computational physics, mathematics, astrophysics, chemistry and engineering



PRACE User Forum

- The User Forum was set up in December 2011 through an initiative of PRACE itself.
- It is an independent entity where PRACE users can discuss their experiences and express their future needs as well as feedback on the current services and resources of the PRACE HPC Research Infrastructure. The aim is to provide an effective mechanism through which the Tier-0 user community can give feedback to PRACE.
- The PRACE User Forum takes the outcomes of these discussions to PRACE on behalf of the User Community and it has visibility in different social networks



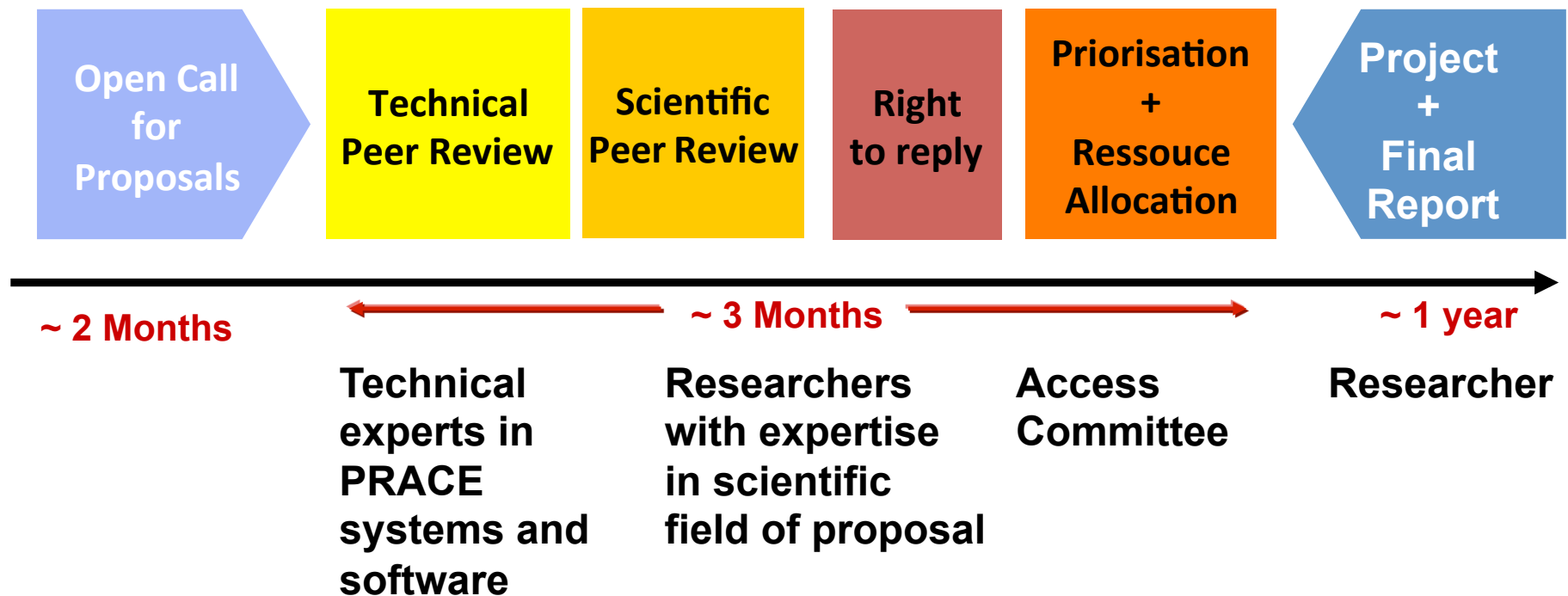
PRACE peer-review access

- Free-of-charge, need to publish results at the end of the award period
- PRACE calls are open for international projects
- Types of resource allocations for scientists
 - **Project Access (every 6 months)**
 - For a specific project, award period ~ 1 to 3 years
 - For individual researchers and research groups (no restriction of nationality for both researcher and centre)
 - Requires to demonstrate technical feasibility of project
 - **Programmatic access**
 - purpose: to ensure a stable and reliable minimum access to the necessary computational resources for large-scale, long term projects of very high scientific quality and with a broad European scope, importance and relevance
 - maximum of 20% of the total resources available for programmatic access
 - **Preparatory Access**
 - Optionally with support from PRACE experts
 - Prepare proposals for Project Access

**Criterion:
Scientific
Excellence**



Project Access





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Access open to industrial users since January 2012

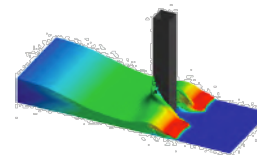
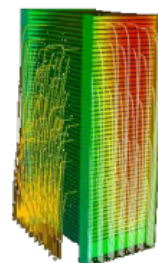
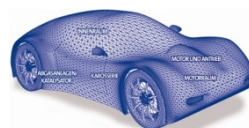
Access to leading-edge resources

- ☐ Regular Calls open to industry twice a year
 - **free of charge**
 - based on scientific excellence only
 - commitment to **publish results** in publicly available media
 - 6 companies benefited from PRACE allocations for more than 100M cpu hours (SMEs, large companies, Private-Public Research Centers)
- ☐ Permanent Preparatory Access call
 - Assess the scalability and port the codes → preparation for future regular calls
 - Large companies & SMEs

Access to high-value services

- ☐ Access to new knowledge enabled through PRACE
- ☐ Training
- ☐ Code enabling
- ☐ Information, Promotion and Networking

Since 2012: 12 companies
> 150 million CPU hours
More than half of them: SMEs



5th PRACE Industrial Seminar
April 15-16, 2013, Stuttgart, Germany



SHAPE Pilot

- The main focus is to work on a **one-to-one** basis with SMEs willing to adopt a new HPC-supported solution
- Based on an integrated set of services:
 - networking,
 - training in PRACE Centres,
 - expertise provided by HPC and domain-specific experts,
 - access to PRACE HPC systems (Open R&D model)
- Support SMEs up to a **proof-of-concept**
 - SMEs will co-developing a concrete **industrial project** with PRACE experts and demonstrate it using PRACE HPC resources.
- After the SHAPE demonstration, companies will have a clear view about:
 - potential of HPC,
 - investments to perform and skills to hire,
 - software or methodologies to develop,
 - next HPC Services to use : PRACE services for Open R&D, buying their own HPC facilities , remote access to HPC services on commercial Cloud platforms.



SHAPE Pilot

- **14 companies** applied to the Call for Proposals (Summer 2013)
- **10 companies** were selected by the Jury (November 2013)
 - **Good EU representation:** SMEs from Bulgaria, France, Germany, Ireland, Italy, Spain and the UK
 - **Various domains** covered: CFD, life sciences, naval, digital media, electromagnetism, pharmaceuticals, micro electronics, etc.
- Projects carried out (between December 2013 and Summer 2014)
 - Results showcased during **PRACEdays14** in Barcelona
 - **Reports available** at: <http://www.prace-ri.eu/shape-prototypes/>
- PRACE Council voted for a **permanent SHAPE** service



PRACE Training

6 PRACE Training Centres:

- Barcelona Supercomputing Center (Spain)
 - CINECA – Consorzio Interuniversitario (Italy)
 - CSC – IT Center for Science Ltd (Finland)
 - EPCC at the University of Edinburgh (UK)
 - Gauss Centre for Supercomputing (Germany)
 - Maison de la Simulation (France)
- are the first PRACE Advanced Training Centres.

PATC events:

from March 2012 until February 2014
(PATCs started in 2012)

125 events
with 2,733 participants
and 360 PATC training days

ALL PRACE training events

(including PATC courses, seasonal schools, workshops, International HPC Summer School, etc), since 2008/09

4992 participants
197 training events
591 training days



International Summer school on HPC, Hungary 2014: Challenges in Computational Sciences

Leading American, Canadian, European and Japanese computational scientists and HPC technologists offered instruction on a variety of topics:

- Access to EU, U.S., Japanese and Canadian HPC-infrastructures
- HPC challenges by discipline (e.g., bioinformatics, computer science, physics...)
- HPC Programming Proficiencies
- Performance analysis & profiling
- Algorithmic approaches & numerical libraries
- Data-intensive computing
- Scientific visualization



Sponsors:





Summer of HPC & Seasonal schools

- **Summer of HPC** is a PRACE programme that offers summer placements at HPC centres across Europe to late stage undergraduates and early stage postgraduate students. Up to ten top applicants from across Europe will be selected to participate. Participants will spend two months working on projects related to PRACE technical or industrial work and ideally produce a visualisation or video of their results.
- **PRACE Seasonal schools** (Autumn school/ Winter school) addresses existing and potential users of High Performance Computing systems in Europe. Researchers and students from Europe will receive advanced training in programming models and optimization techniques, MPI/ OpenMP and hybrid programming, profiling and benchmarking.



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enable Science foster Industry

26 - 28 May 2015, DUBLIN, IRELAND

