



PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE

# PRACE autumn school

## HPC and Big Data

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# PRACE | Members

## Hosting Members

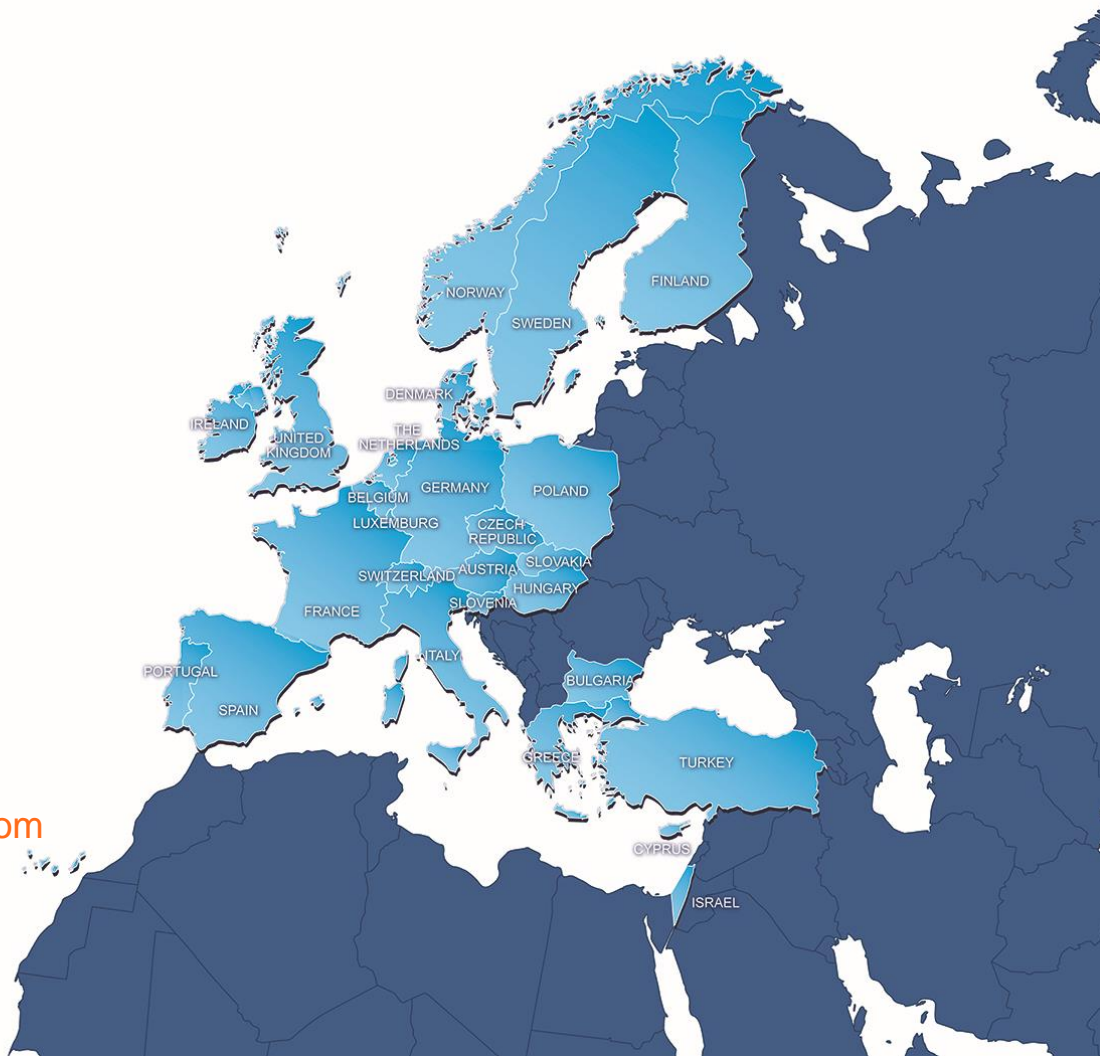
- ▶ France
- ▶ Germany
- ▶ Italy
- ▶ Spain
- ▶ Switzerland

## General Partners (PRACE 2)

- ▶ Austria
- ▶ Belgium
- ▶ Bulgaria
- ▶ Cyprus
- ▶ Czech Republic
- ▶ Denmark
- ▶ Finland
- ▶ Greece
- ▶ Hungary
- ▶ Ireland
- ▶ Israel
- ▶ Luxembourg
- ▶ Netherlands
- ▶ Norway
- ▶ Poland
- ▶ Portugal
- ▶ Slovakia
- ▶ Slovenia
- ▶ Sweden
- ▶ Turkey
- ▶ United Kingdom

## Observers

- ▶ Croatia



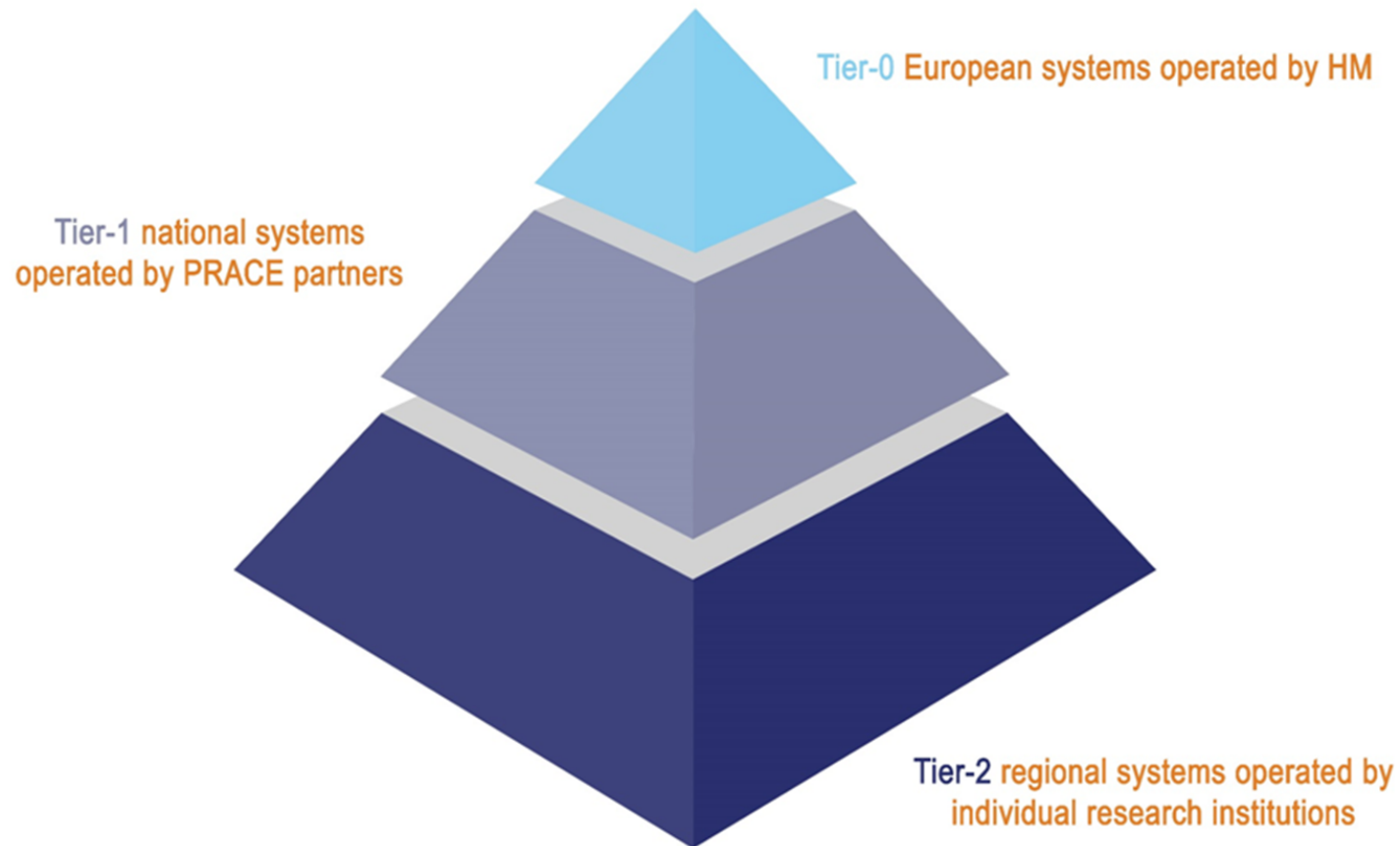


# PRACE | access to HPC

- ▶ **Open access** to world-class HPC systems to EU scientists and researchers
- ▶ **Variety of architectures** to support the different scientific communities
- ▶ High standards in **computational science** and engineering
- ▶ **Peer Review** at European level to foster scientific excellence
- ▶ Robust and persistent **funding scheme** for HPC supported by national governments and European Commission (EC)
- ▶ Collaborate with European HPC **industrial** users and suppliers



# HPC pyramid





# PRACE | Tier-0 Systems

**NEW ENTRY 2018**  
**JUWELS (Module 1):** Bull  
Sequana  
GAUSS @ FZJ, Jülich, Germany  
#23 Top 500



**MareNostrum:** IBM  
BSC, Barcelona, Spain  
#22 Top 500



**Piz Daint:** Cray XC50  
CSCS, Lugano, Switzerland  
#6 Top 500



**SuperMUC :** Lenovo  
cluster GAUSS @ LRZ,  
Garching, Germany #57  
Top 500 **NEW ENTRY soon SuperMUC NG**



**NEW ENTRY 2018**  
**JOLIOT CURIE :** Bull Sequana  
GENCI/CEA, Bruyères-le-Châtel,  
France #34 Top 500



**MARCONI:** Lenovo  
CINECA, Bologna, Italy  
#18 Top 500

**Hazel Hen:** Cray  
GAUSS/HLRS,  
Stuttgart, Germany  
#27 Top 500



**Close to 110 Petaflops  
cumulated peak  
performance**



# PRACE | training

a **sustained, high-quality** training and education service for the European HPC community

Different **levels** of training

- Basic, intermediate, advanced **HPC**
- Parallel programming
- Accelerators
- Performance optimisation

**Domain-specific** topics

- Simulation software
- Visualisation
- Data intensive computing

6 PRACE Advanced **Training Centres**

4 PRACE Training Centres

PRACE **Training Events**: Seasonal Schools, International HPC Summer School, On-demand training events

PRACE Training and Events portal

**Code Vault**

Massive Open Online Courses (**MOOCs**)

**Summer of HPC**

(Programme for undergraduate and postgraduate students)



# PRACE | achievements by till 2019

- ▶ 610 scientific projects enabled
- ▶ 17 600 000 000 (thousand million) core hours awarded since 2010
- ▶ Of which 63% led by another PI nationality than the HM
- ▶ R&D access to industrial users with >50 companies supported
- ▶ >11 500 people trained through PRACE Training



# PRACE | HPC and Big Data

- ▶ **Introduction to Linux and HPC** (Dr. Leon Kos, UL, SI)
- ▶ **HADOOP** (Dr. Amy Krause, Andreas Vroutsis, EPCC Edinburgh, UK)
- ▶ **Spark** (Dr. Amy Krause, Andreas Vroutsis, EPCC, Edinburgh, UK)
- ▶ **Rhadoop** (Dr. Janez Povh, UL, SI)
- ▶ **SALOME** (Nathalie Gore, OpenCASCADE, F, Dr. Paul Rasclé, EDF R&D, F)
- ▶ **TensorFlow** (Dr Marco Rorro, CINECA, I, Primož Godec, UL, SI, Rok Hribar, JSI, SI)