Access to HPC resources in Italy and Europe

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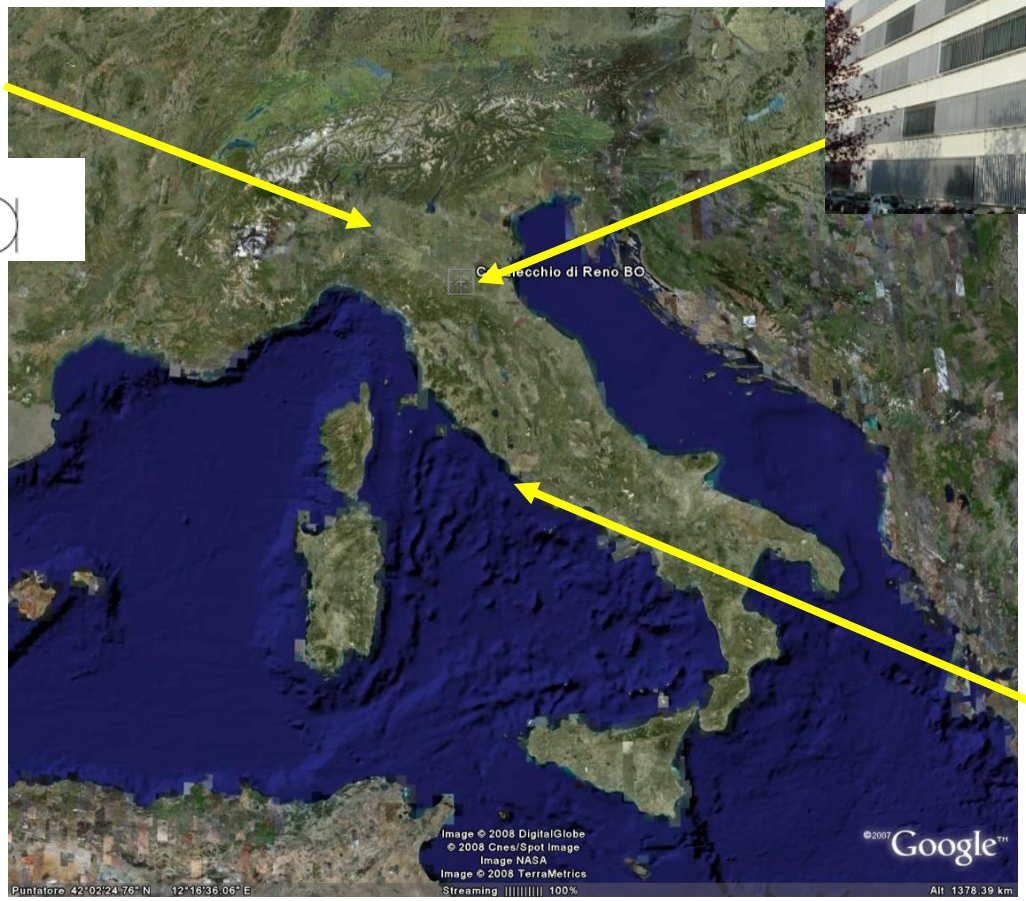
CINECA 2.0



CINECA

CASPUR

FERMI@CINECA

Architecture: 10 BG/Q Frames
Model: IBM-BG/Q
Processor type: IBM PowerA2 @1.6 GHz
Computing Cores: 163840
Computing Nodes: 10240
RAM: 1GByte / core (163 PByte total)
Internal Network: 5D Torus
Disk Space: 2PByte of scratch space
Peak Performance: 2PFlop/s

N. 7 in Top 500 rank (June 2012)

National and PRACE Tier-0 calls

EURORA@CINECA

EUROTECH Cluster linux

Processor type: 2 eight-cores Intel Xeon *E5-2687W* Sandy Bridge-EP 3.1GHz

N. of nodes / cores: 64 / 1024

RAM: 16 GB/Compute node

Internal Network: Infiniband & Custom

Accelerators: NVIDIA Tesla K20

(INTEL Xeon Phi coming soon)

Peak performance: 110 TFlops

PLX@CINECA

IBM Cluster linux

Processor type: **2 six-cores Intel Xeon (Exa-Core Westmere)**

X 5645 @ 2.4 GHz, 12MB Cache

N. of nodes / cores: 274 / 3288

RAM: 48 GB/Compute node (14 TB in total)

Internal Network: Infiniband with 4x QDR switches (40 Gbps)

Accelerators: 2 GPUs NVIDIA M2070 per node

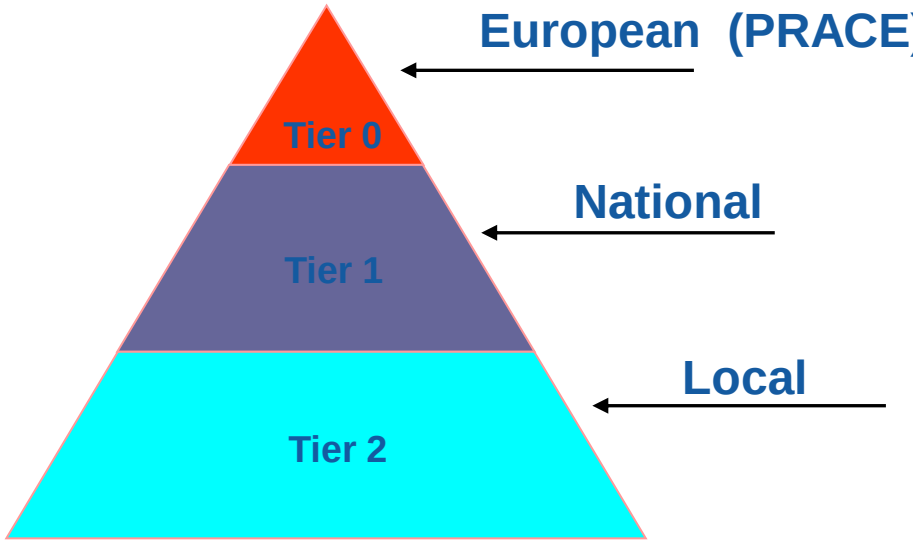
548 GPUs in total

Peak performance: 32 TFlops

565 TFlops SP GPUs

283 TFlops DP GPUs

The European HPC-Ecosystem



Creation of a European HPC ecosystem involving all stakeholders

- ✓ **HPC service providers on all tiers**
- ✓ **Scientific and industrial user communities**
- ✓ **The European HPC hw and sw industry**

- PRACE Research Infrastructure (www.prace-ri.eu): the top level of the European HPC ecosystem

- **CINECA:**
- - represents Italy in PRACE
- - hosting member in PRACE
- - Tier-0 system

  BG/Q 2 PFlop/s
- - Tier-1 system

  > 5 % PLX
- involved in PRACE 1IP, 2IP,3IP
- PRACE 2IP prototype EoI

Access to HPC resources: CINECA aims and basic principles

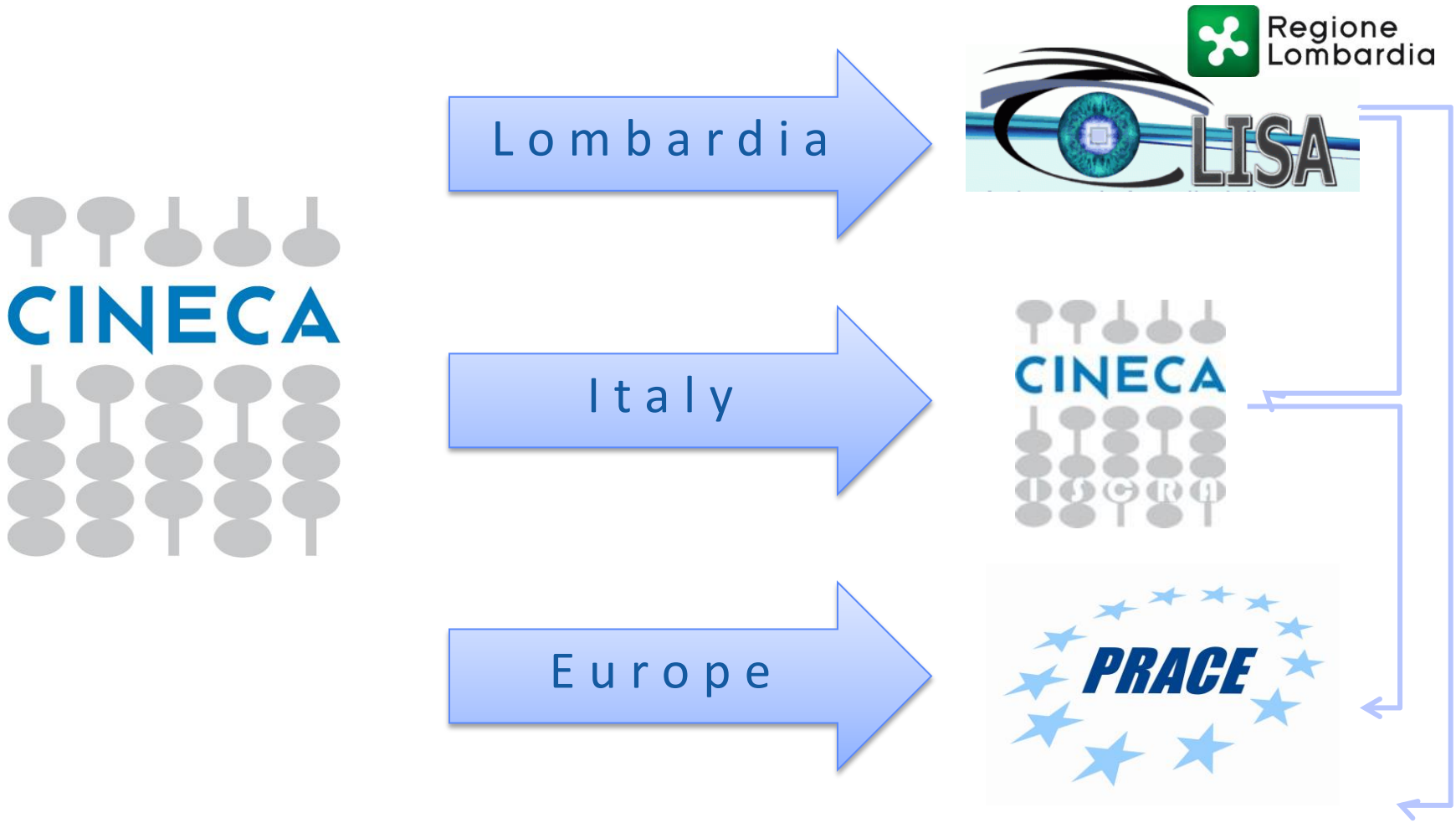
Our objectives:

- ✓ Providing Italian and European researchers with an advanced computational environment
- ✓ Supporting Italian researcher for increasing their competitiveness
- ✓ Following Italian researchers in their path towards Tier 0
- ✓ Soliciting large-scale and computationally intensive projects

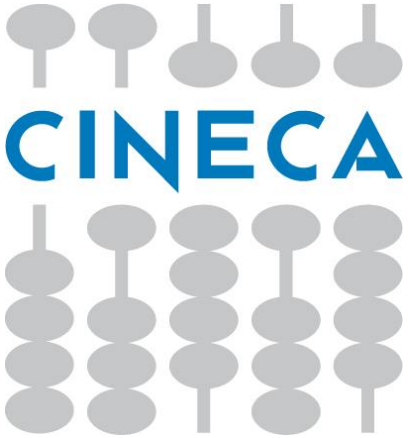
Basic principles:

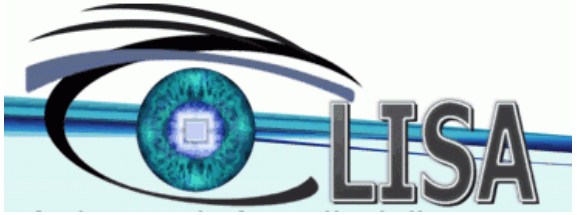
- ✓ Transparency
- ✓ Fairness
- ✓ Conflict of Interest management
- ✓ Confidentiality

L'offerta HPC

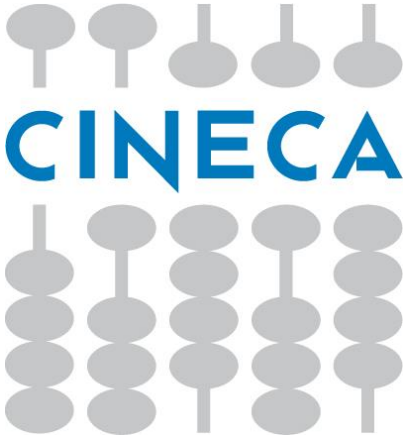


L'offerta HPC in Lombardia





HPC in Italy



HPC offer in Italy: ISCRA
Italian SuperComputing Resource Allocation

The aim of ISCRA is to ensure adequate support to Italian scientists and engineers.

The allocation is of 600M core hours per year on

- FERMI

The access is by

- Online submission of proposals
- Peer-review process by an international panel

The proposal are scientifically evaluated by international reviewers and technically evaluated by Cineca experts.

Applications and codes are evaluated on the basis of their computational readiness.

HPC offer in Italy: ISCRA

Class B: Standard Projects; two calls / year

1-10M core hours

duration: 12 months

FERMI only

HPC offer in Italy: ISCRA

Class C: Small Projects

continuous submission, 12 selections per year

>50K core hours

typical request 1M

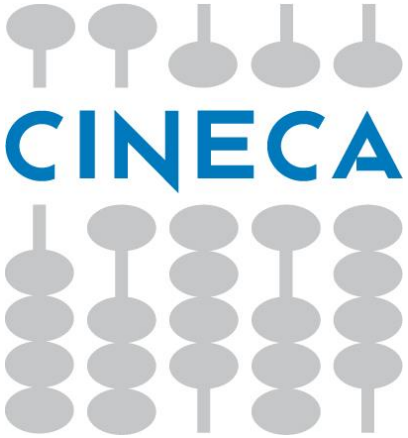
only two C projects approved per year

duration: 9 months

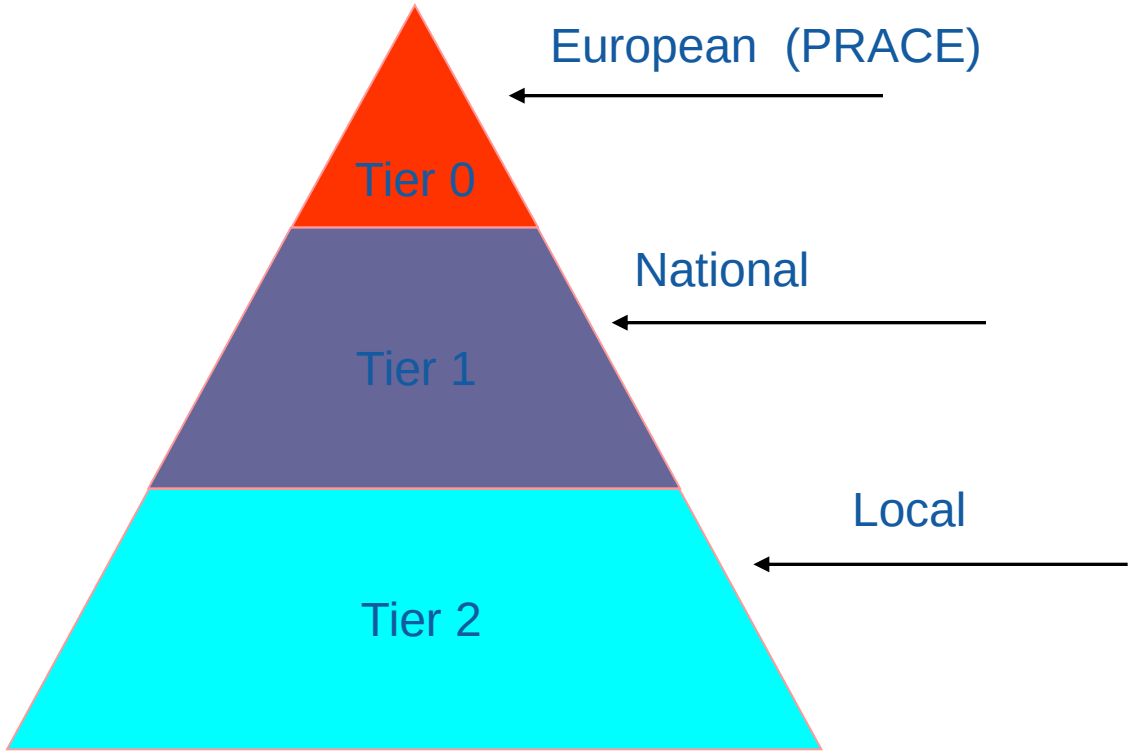
EURORA available (50.000h)

Trial: on demand

L'offerta HPC in Europa: PRACE



Computing provisioning pyramid



PRACE offers access to Tier 0 (and Tier 1) systems

PRACE Tier 0 Access

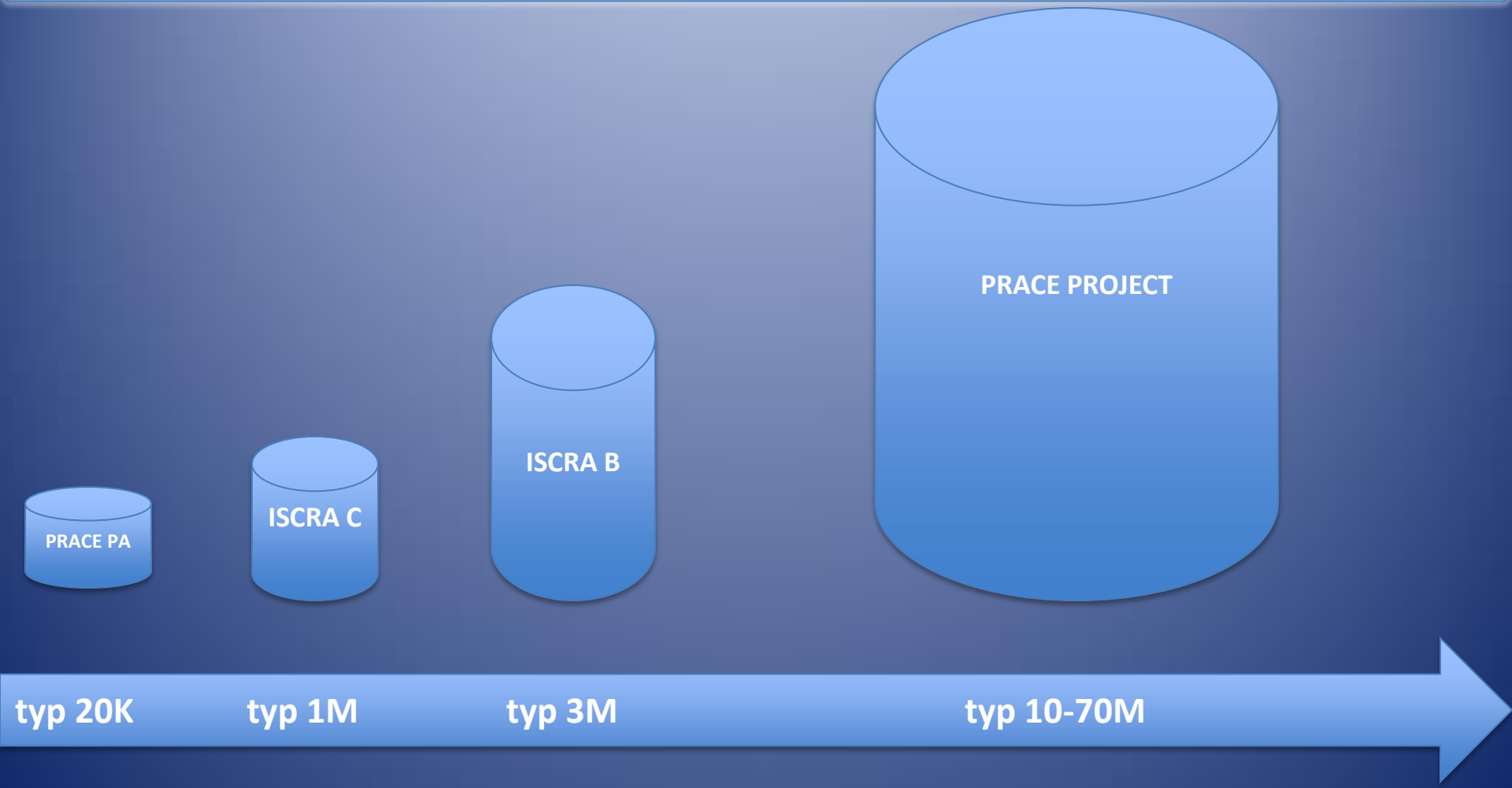
- **Preparatory Access**
  - Intended for preliminary resource use required to prepare proposals for Project Access
  - Technical review
  - Continuously open calls

- **Project Access**
  - Intended for individual researchers and research groups including multi-national research groups
  - Technical and Scientific review

PRACE Tier 0 Access: CURRENT CALL

- Applications accepted on call
- For projects which use codes that have been previously tested and must have demonstrated high scalability and optimisation

Projects dimension



Useful links

- ISCRA: http://www.hpc.cineca.it/services/iscra

- PRACE: www.prace-ri.eu/hpc-access?lang=en