



PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE

Sharing the best computational resources

2010 Euro-Africa e-Infrastructures Conference, Helsinki

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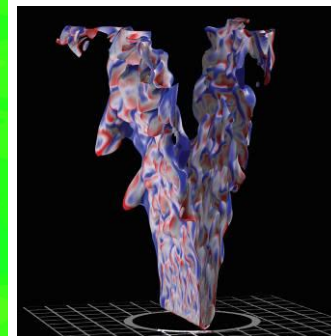
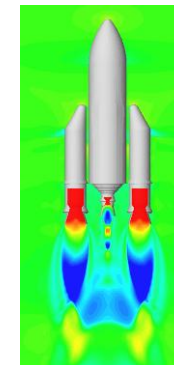
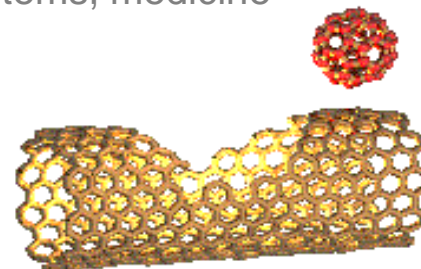
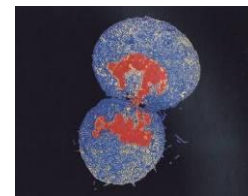
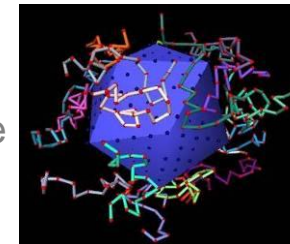
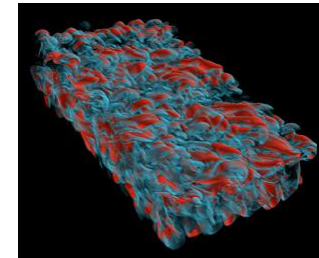
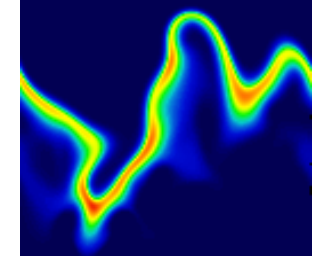
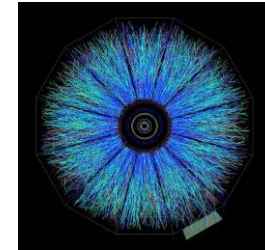
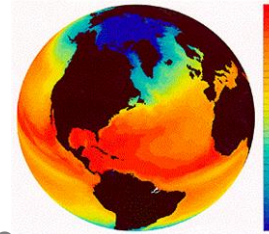


Rationale

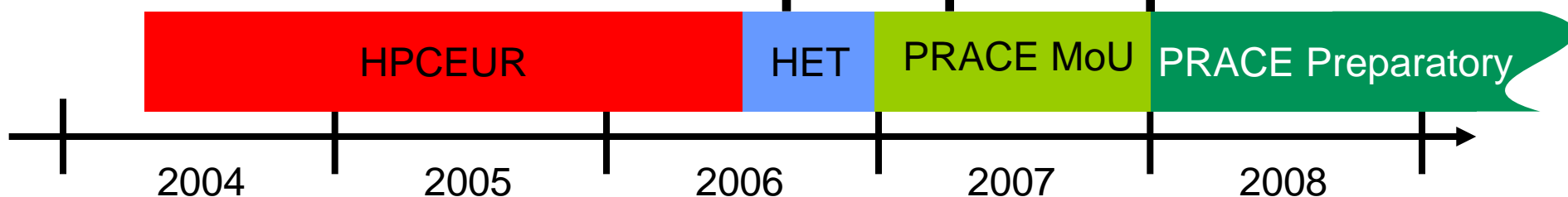
- **Europe must maintain its high standards in computational science and engineering**
- **Europe has to guarantee independent access to HPC-systems of the highest performance class for all computational scientists in its member states**
- **Scientific Excellence requires peer review on European scale to foster best ideas and groups**
- **User requirements as to variety of architectures requires coordinated procurement**
- **EU and national governments have to establish robust and persistent funding scheme**

The European Scientific Case

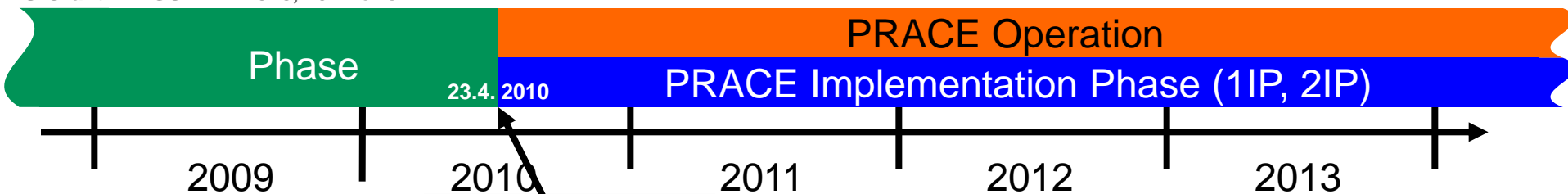
- **Weather, Climatology, Earth Science**
 - degree of warming, scenarios for our future climate.
 - understand and predict ocean properties and variations
 - weather and flood events
- **Astrophysics, Elementary particle physics, Plasma physics**
 - systems, structures which span a large range of different length and time scales
 - quantum field theories like QCD, ITER
- **Material Science, Chemistry, Nanoscience**
 - understanding complex materials, complex chemistry, nanoscience
 - the determination of electronic and transport properties
- **Life Science**
 - system biology, chromatin dynamics, large scale protein dynamics, protein association and aggregation, supramolecular systems, medicine
- **Engineering**
 - complex helicopter simulation, biomedical flows, gas turbines and internal combustion engines, forest fires, green aircraft,
 - virtual power plant



PRACE Timeline



EU-Grant: INFSo-RI-211528, 10 Mio. €

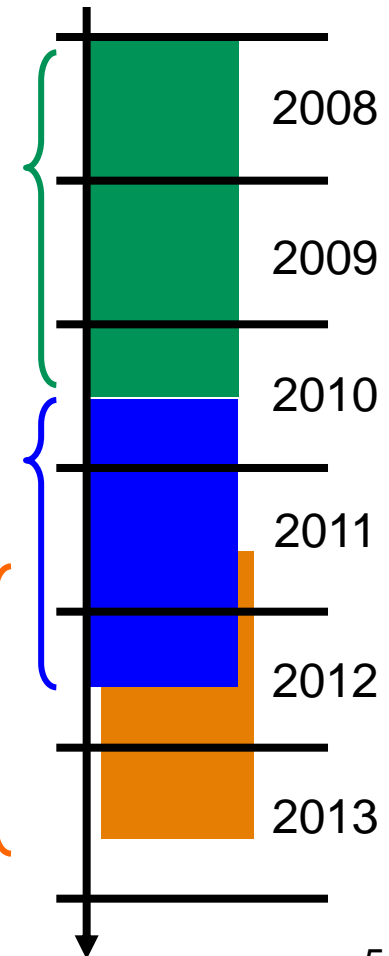


**PRACE (AISBL), a legal entity
with (current) seat location in Brussels**



PRACE Roadmap

- **Preparatory Phase Project (2008 – 2010)**
 - Perform all legal, administrative, financial, and technical preparations for the creation of the PRACE Research Infrastructure (RI)
- **Creation of the PRACE legal entity: April 2010**
 - First Tier-0 cycles provided: August 2010
- **1st Implementation Phase Project (2010 – 2012)**
 - Accelerate the Implementation of the RI
 - Focus: User support, operation, technical and legal/administrative evolution, ecosystem / Tier-1 relations
- **Planned 2nd Implementation Phase Project (2011 – 2013)**
 - Integration of Tier-1 services
 - Extended scientific and industrial community relations and support
- Envisaged: 3rd Implementation Phase project (2012 – 2014)



PRACE Research Infrastructure Created

- Establishment of the legal framework
 - PRACE AISBL created with seat in Brussels in April (Association Internationale Sans But Lucratif)
 - 20 members representing 20 European countries
 - Inauguration in Barcelona on June 9

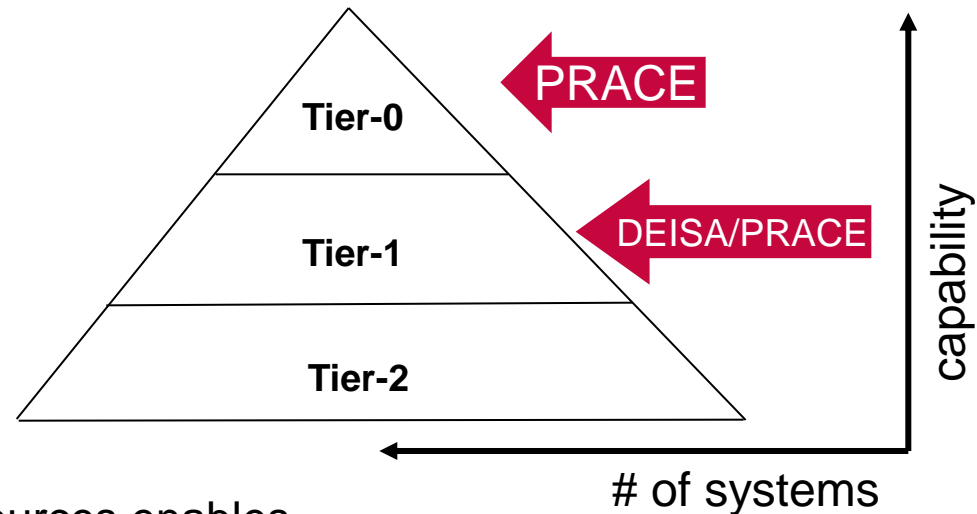


- Funding secured for 2010 - 2015
 - 400 Million € from France, Germany, Italy, Spain
Provided as Tier-0 services on TCO basis
 - Funding decision for 100 Million € in The Netherlands
expected soon
 - 70+ Million € from EC FP7 for preparatory and implementation
Grants INFSO-RI-211528 and 261557
Complemented by ~ 60 Million € from PRACE members



Ecosystem Integration

- Ensure the right level of integration in/with the tiers
- Tier-0 – full integration
 - Creation of new high-end resources
 - Single access route
 - Single operational model
- Tier-1
 - Integration of existing national resources enables non hosting countries to contribute
 - Different funding / governance requires adapted approach
 - Leverage DEISA successes, like network, DECI
- Tier-2 / Grids
 - Different funding and usage models, overlapping user groups
 - Cooperate and inter-operate for the benefit of users



PRACE Tier-0 Systems

- 1st Tier-0 System provides cycles since August 1
 - Jugene: BlueGene/P in GCS@Juelich
 - 72 Racks, 1 PFlop/s Peak
 - 35% of capacity provided to PRACE
- 2nd Tier-0 System announced by GENCI on October 5
 - Curie: Bull Cluster with Intel CPUs operated by CEA
 - 1.6 PFlop/s peak in Oct. 2011 (1st step in 10/2010)
 - Largest fraction of capacity provided to PRACE
- Next Procurements (in alphabetical order)
 - BSC, CINECA, GCS@HLRS, GCS@LRZ
 - Procurement plan based on analysis of user requirements and market



Tier-0 Access: First Calls

- Early Access Call in May 2010
 - 68 proposals asked for 1870 Million Core hours
 - 10 projects granted with 328 Million Core hours
 - Principal Investigators from D (5), UK (2) NL (1), I (1), PT (1)
 - Involves researchers from 31 institutions in 12 countries
- 1st Regular Call closed on August 15
 - 58 proposals received asked for 2900 Million Core hours
 - 33 proposals have fulfilled the Technical assessment
 - 9 projects with 362 Million Core hours granted
 - PIs from 5 countries
- Further calls being scheduled (every 6 months)
 - 2nd regular call published on November 1st, 2010

High-End HPC Resources granted

Year	TFlop/s years granted	Provider
2005	6	DEISA
2006	6	DEISA
2007	15	DEISA
2008	24	DEISA
2009	30	DEISA
2010	201	PRACE

PRACE ...

- has prepared the creation of an operational European Tier-0 HPC service
- has secured national (400 Million €) and European (70 Million €) funding commitments
- has extended its geographical coverage in Europe from 14 to 20 countries
- has established itself as the key European HPC player
- is addressing a huge demand, as the high over-subscription of the current Tier-0 resources demonstrates



PRACE is rapidly ramping up its services and proceeds to integrate the HPC ecosystem

Thank you on behalf of the European Heavy Computing Community!

