



International Workshop on Readiness of HPC Extreme-scale Applications

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HORIZON-EUROHPC-JU-2023-COE



EuroHPC
Joint Undertaking

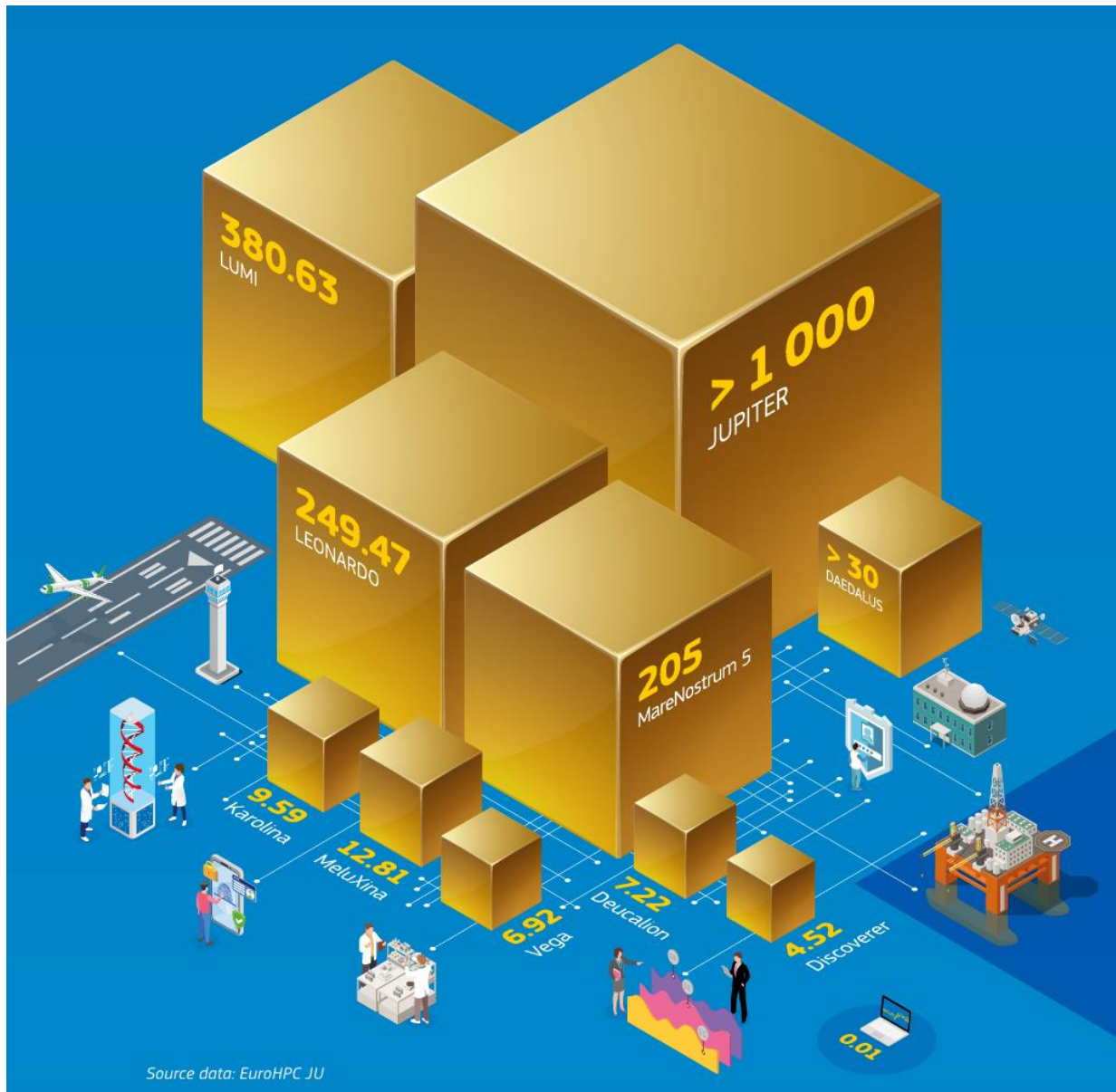
1 January 2024 – 31 December 2026

Grant Agreement No 101143931



- PASC minisymposia
 - [virtual], July 2021
 - Performance Optimisation and Productivity for EU HPC Centres of Excellence (and all other European parallel application developers preparing for exascale)
 - Davos/CH, June 2023
 - Are HPC Codes Ready for Exascale? A EU HPC Centre of Excellence Point of View

EuroHPC supercomputers & CoEs



esiwace
CENTRE OF EXCELLENCE IN SIMULATION OF WEATHER
AND CLIMATE IN EUROPE



JUPITER

The Arrival of
Exascale in Europe

fz-juelich.de/jupiter | [#exa_jupiter](https://twitter.com/#!/exa_jupiter)



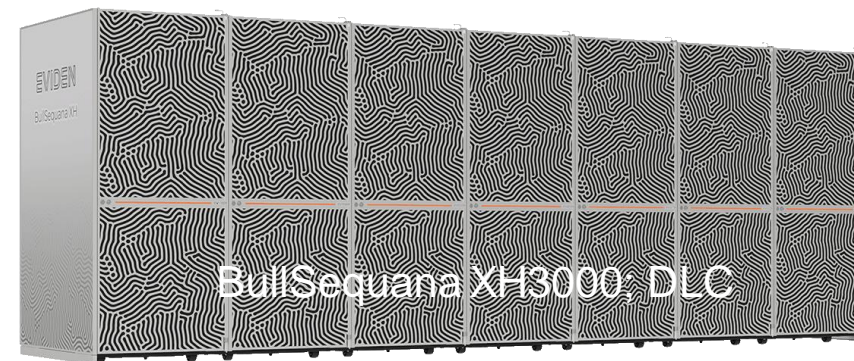
Ministry of Culture and Science
of the State of
North Rhine-Westphalia



GCS
Gauss Centre for Supercomputing

DISCOVERING JUPITER

- First Exascale system in Europe (HPL); modular system
- Procured/funded by: EuroHPC JU, BMBF/NRW-MKW
 - Contract signed end of 2023
 - Installation starting soon
- JUPITER **Booster**: High scalability; 1 EFLOP/s HPL, >70 EFLOP/s FP8
- JUPITER **Cluster**: High versatility; 0.5 B/FLOP balance
- Network: InfiniBand NDR; Storage: 20 PB NVMe, 200 PB HDD
- Deployed in Modular Datacenter
- Building on: MSA (JUWELS); DEEP, EPI; ThunderX2, Ampere; ...
- About **1.936.000 Arm cores**



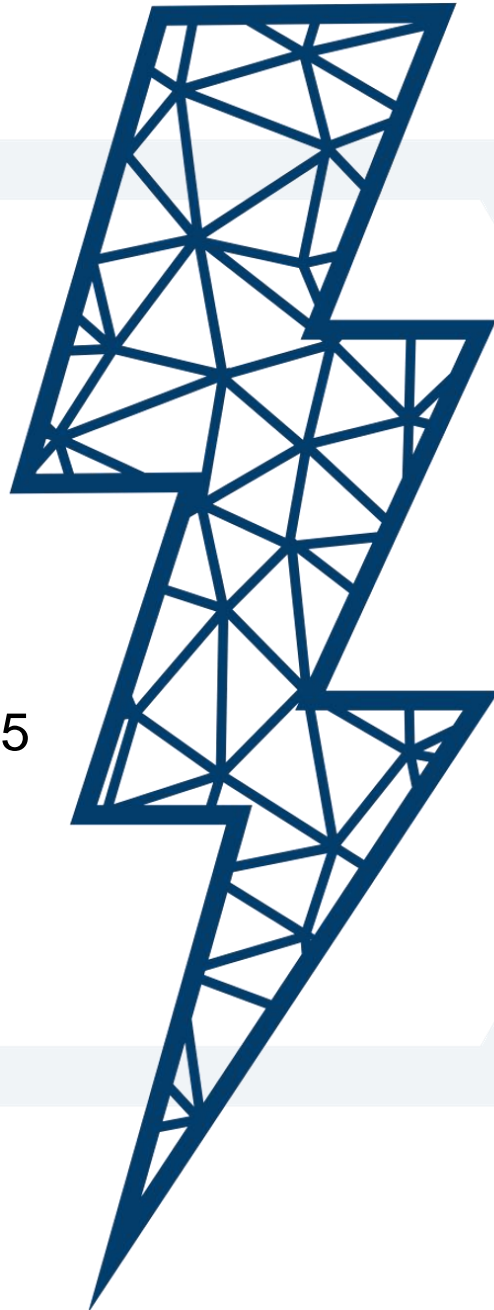
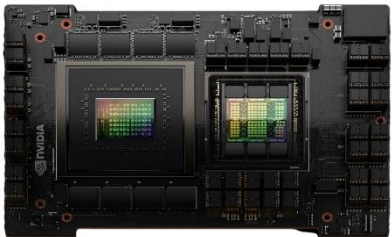
EVIDEN



JUPITER MODULES

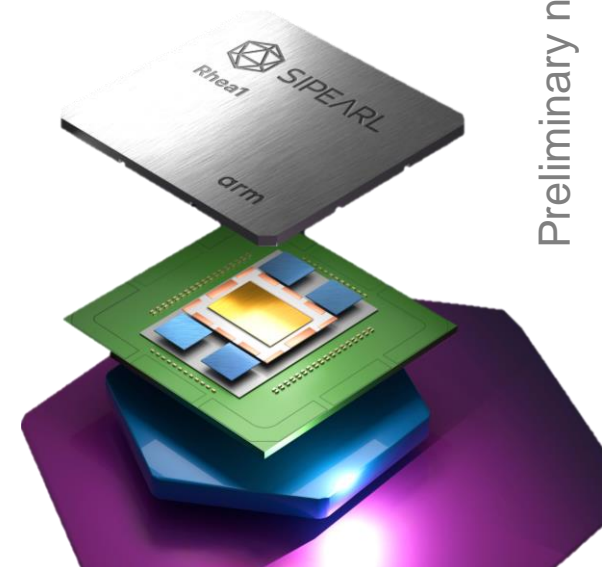
JUPITER Booster

- Node design
 - ~6000 nodes
 - 4x NVIDIA CG1 per node
- CG1: Grace-Hopper
 - 72 Arm Neoverse V2 cores (4x128b SVE2); 120 GB LPDDR5
 - H100 (132 SMs); 96 GB HBM3
 - NVLink C2C (900 GB/s)




JUPITER Cluster

- Node design
 - ~1300 nodes
 - 2x SiPearl Rhea1 per node
- Rhea1
 - 80 Arm Neoverse V1 cores (2x256b SVE)
 - 256 GB DDR5, 64 GB HBM2e



ENABLEMENT: JEDI, JUREAP

-  JEDI: JUPITER Exascale Development Instrument
 - 48 nodes, *currently 24*; JUPITER design
 - Top 1 Green500!
- Usage
 - System management preparations
 - Application porting
 - JUPITER Research and Early Access Program
 - Currently: Call for Participation
 - Soon: Invitation for Proposals

JUREAP

Seeding Exascale
in Europe!

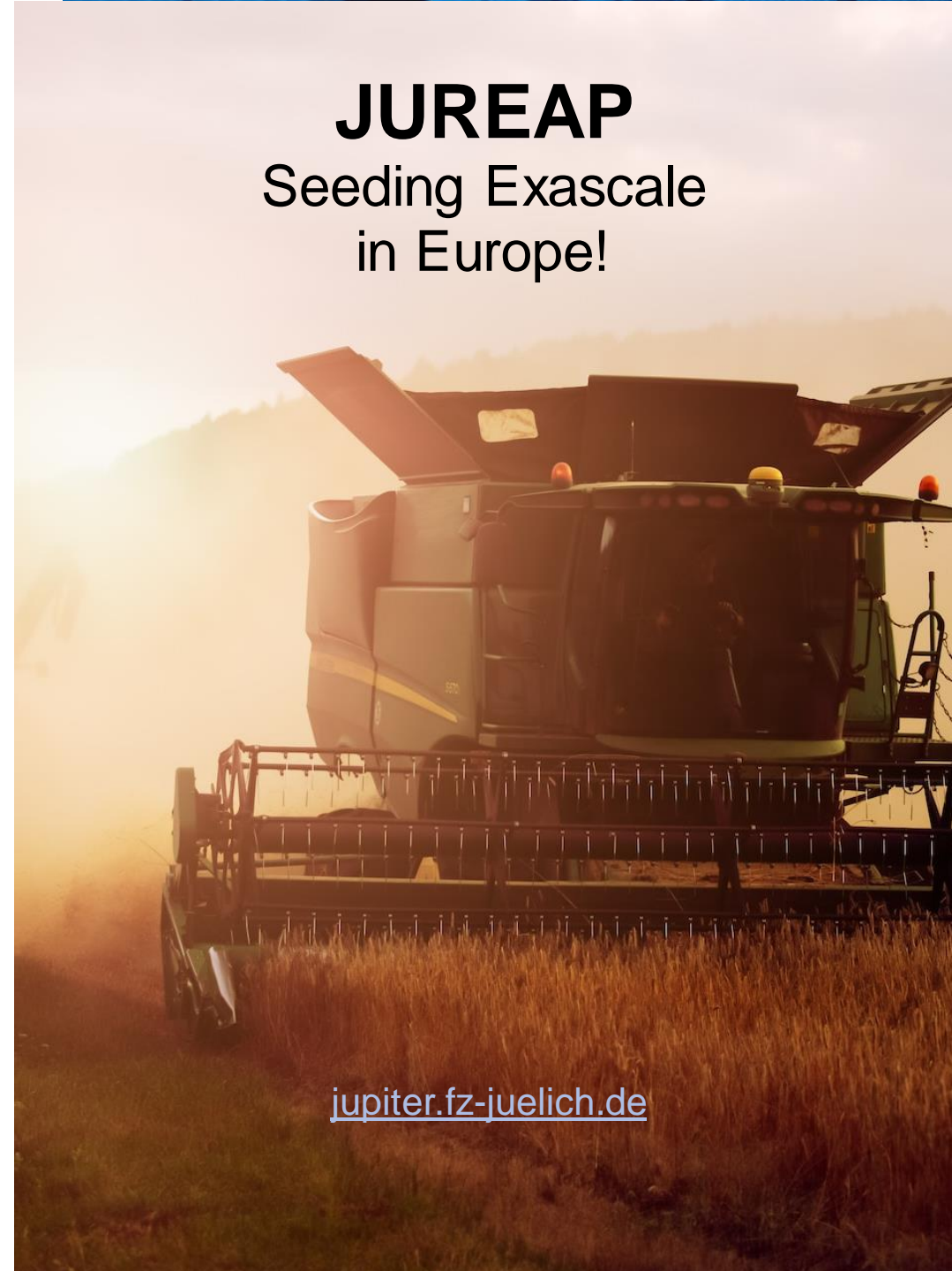
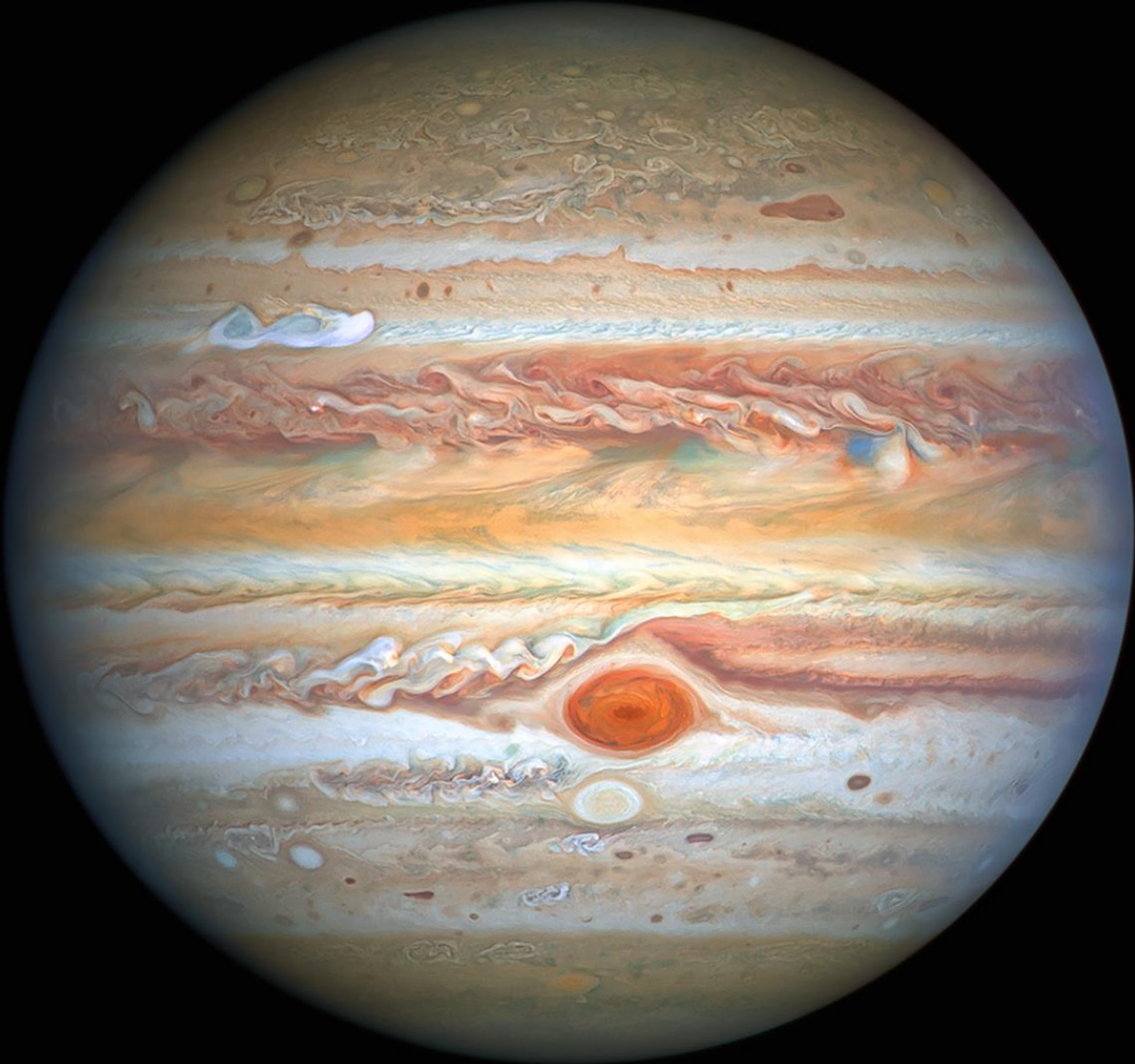


Image: ESA/Hubble



BIG

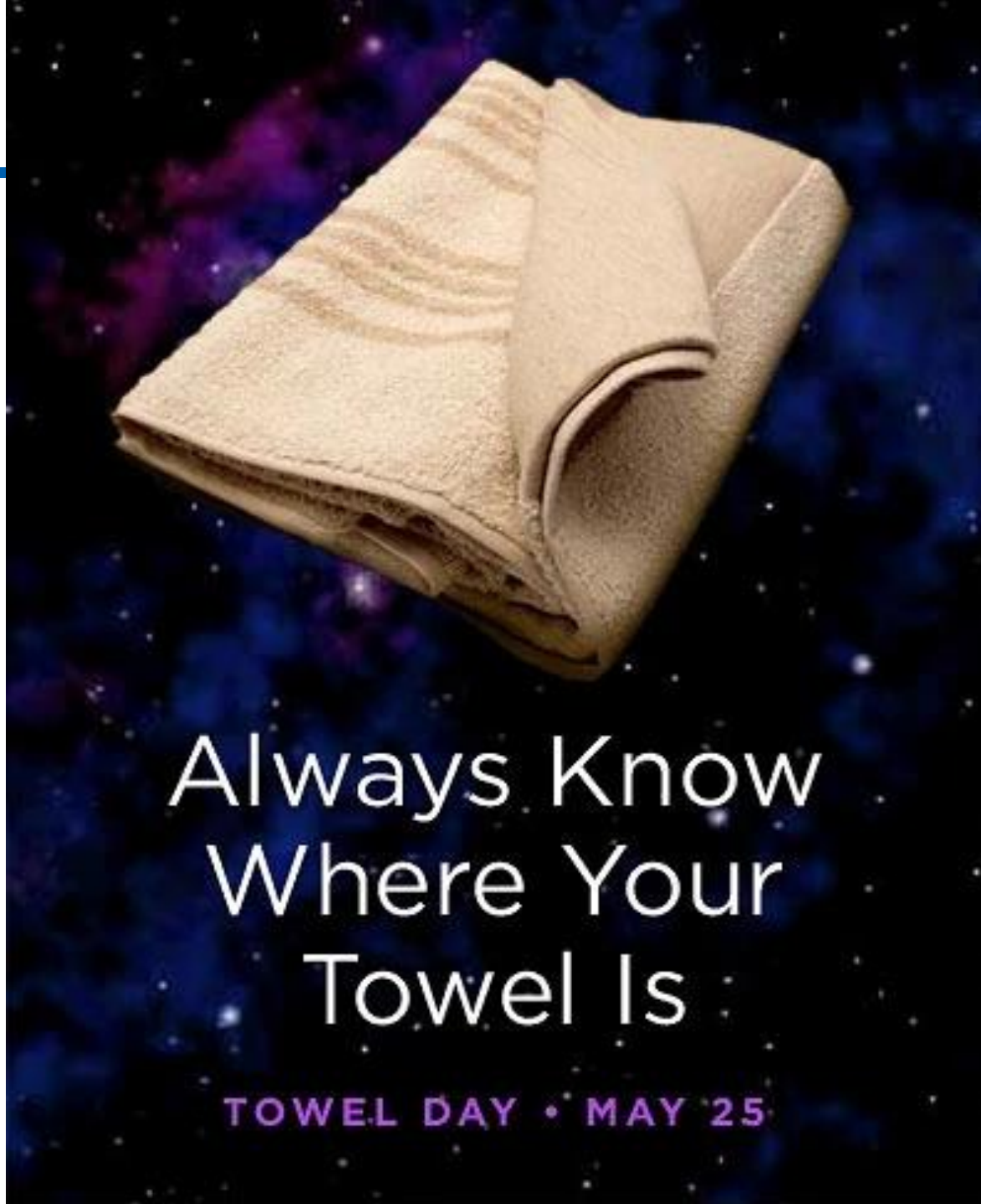
Really Big.

You just wont believe how vastly, hugely,
mind-boggingly big it is.



**DON'T
PANIC
AND
CARRY
A TOWEL**

Tools



Get EXTRAE

Get PARAVÉR

Get DIMEMAS

tools.bsc.es

Workshop outline



- 14:00 [45] Welcome & Introduction
- 14:45 [75] CoE & applications presentations (5x15)
- 16:00 [30] *Break*
- 16:30 [30] "Lessons Learned by the DOE Exascale Computing Project"
(Lois Curfman McInnes, ANL/USA)
- 17:00 [55] Panel discussion
 - HPC application CoEs' preparations for exa-scale
- 17:55 [5] Conclusion
- 18:00 *Adjourn*

Workshop agenda (Part 1)



- 14:00 [45] Welcome & Introduction to workshop (García & Wylie)
 - "EuroHPC JU: Supporting the European HPC application ecosystem" (Mladen Skelin, EuroHPC JU)
- 14:45 [75] CoE & applications presentations (5x15)
 - "NEKO: A modern, portable, and scalable framework for high-fidelity computational fluid dynamics" (Niclas Jansson, KTH/S)
 - "GROMACS: meeting exascale portability and performance challenges" (Szilárd Páll, KTH/S)
 - "Deploying your software just once for all EuroHPC supercomputers is EESSI" (Lara Peeters, UGhent/B)
 - "Exascale for mid-scale applications" (Simon Burbidge, DiRAC/UK)
 - "Performance portable and scalable particulate flow simulations using the waLBerla framework" (Harald Köstler, FAU/D)
- 16:00 [30] *Break*

Workshop agenda (Part 2)



- 16:30 [30] Keynote
 - "Lessons Learned by the DOE Exascale Computing Project" (Lois Curfman McInnes, ANL/USA)
- 17:00 [55] Panel discussion (moderator: Guy Lonsdale, scapos/D)
 - HPC application CoEs' preparations for exa-scale
 - Lois Curfman McInnes, ANL/USA)
 - Linda Gesenhuis (EuroHPC JU)
 - Niclas Jansson (KTH/S)
 - Erwan Raffin (Eviden/F)
 - Nicola Spallazani (CNR/I)
 - Harald Köstler (FAU/D)
- 17:55 [5] Conclusion (García & Wylie)
- 18:00 *Adjourn*

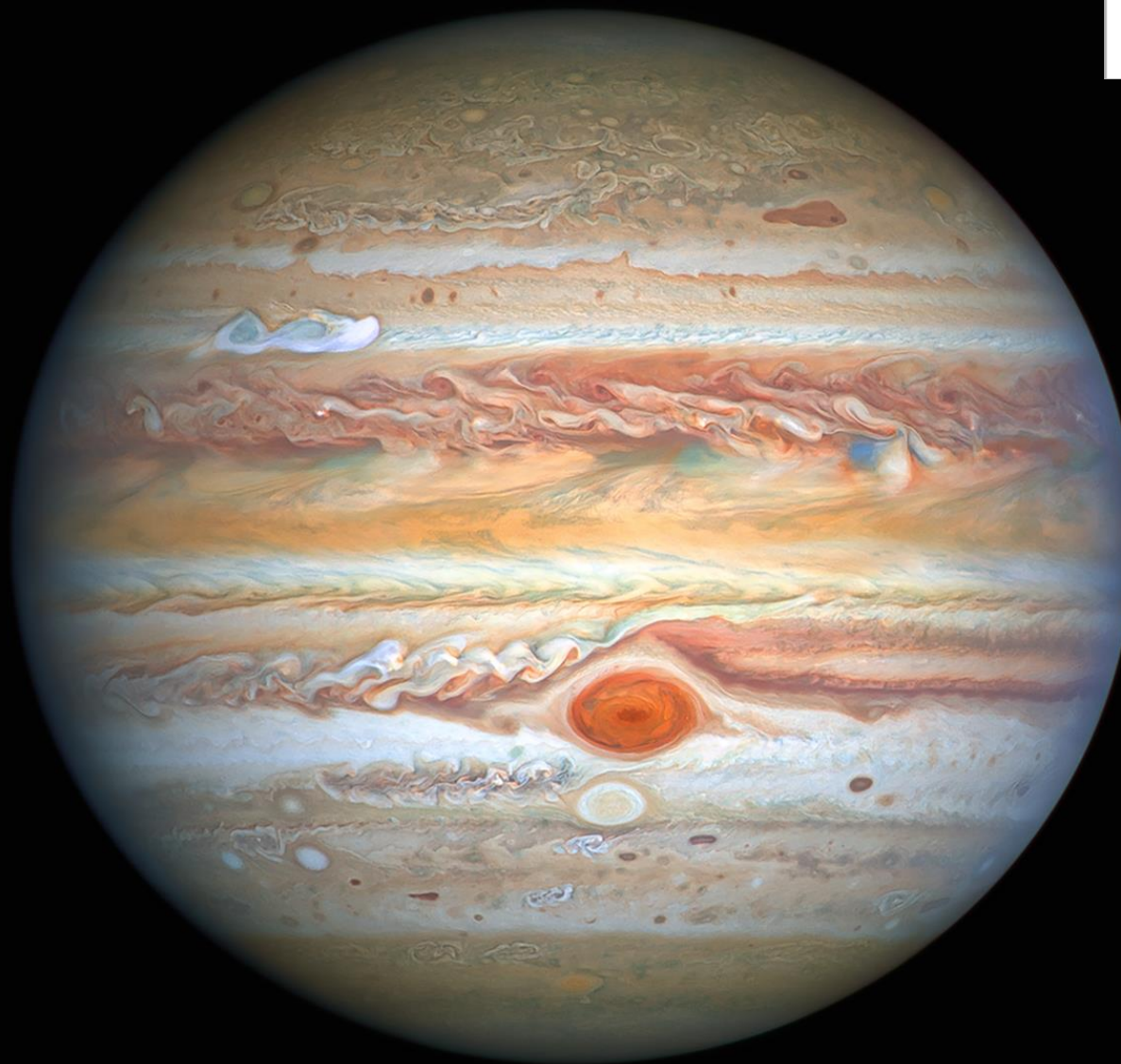


ISC

High Performance

REINVENTING

HPC



International Workshop on
Readiness of HPC Extreme-scaling Applications



EuroHPC
Joint Undertaking



Performance Optimisation and Productivity

A Centre of Excellence in HPC

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 [@POP_HPC](#)

 [youtube.com/POPHPC](https://www.youtube.com/POPHPC)

