EUROHPC SUMMIT 2024

ANTWERP

UNLEASHING THE POWER OF EUROPEAN HPC AND QUANTUM COMPUTING

PLENARY: Challenges in HPC after Exascale

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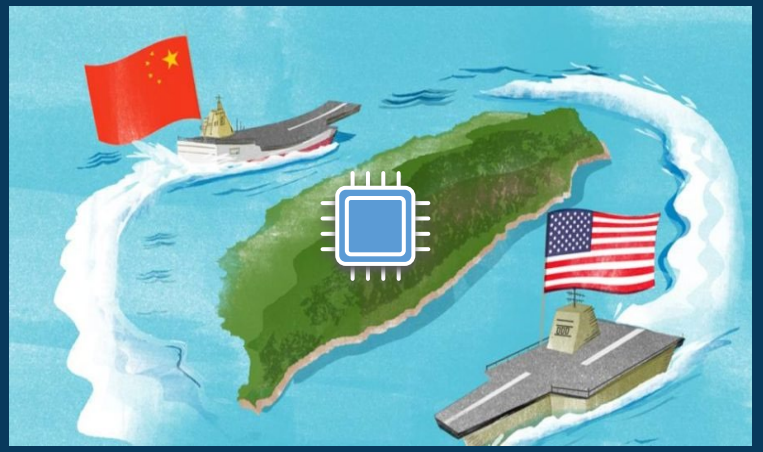
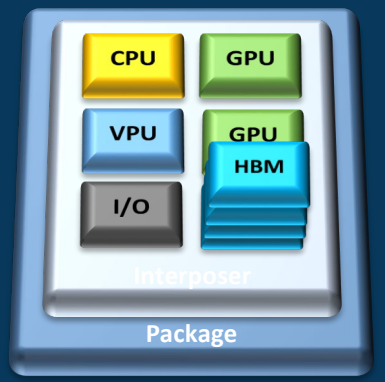
Challenges in HPC after Exascale

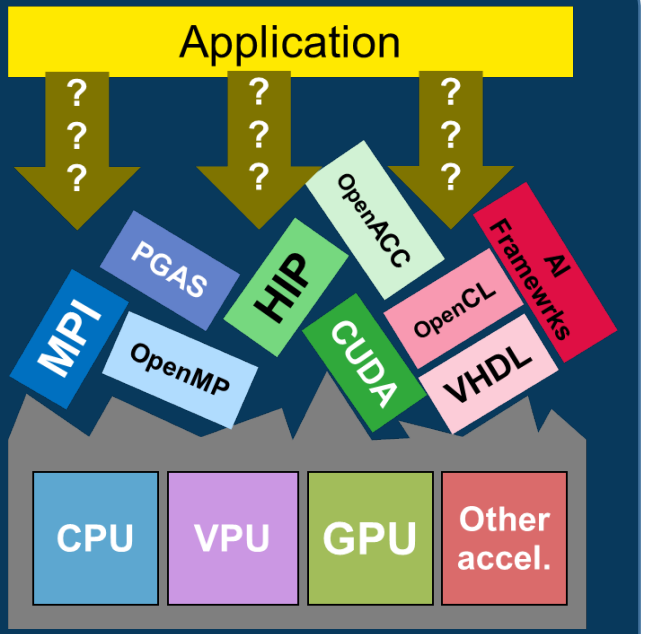
https://woodsidepawprint.com/feature/2022/01/12/taiwan-vs-china-whats-at-stake/



Technology dependency

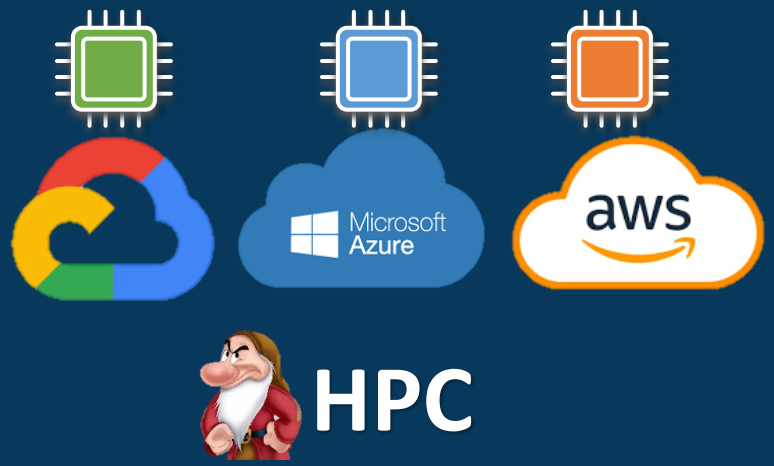


Even more HW heterogeneity



Lack of performance portability

Logos owned by respective companies
Graphic owned by Disney/Imgbin



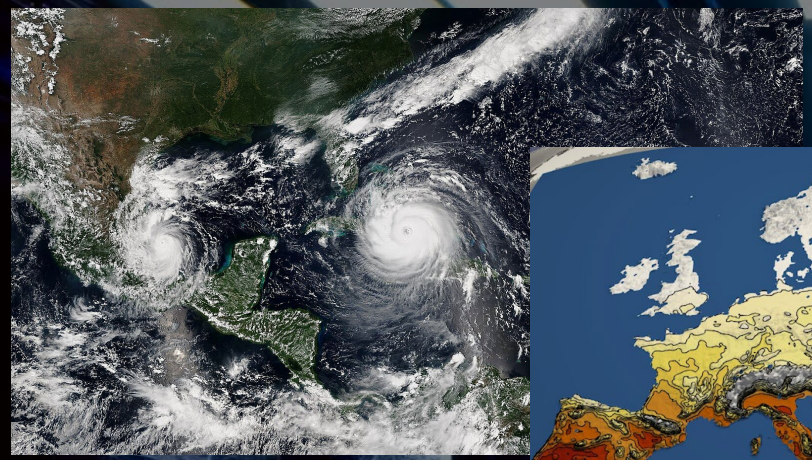
HPC vs. Hyperscalars

https://globalenergymonitor.org/projects/global-coal-plant-tracker/

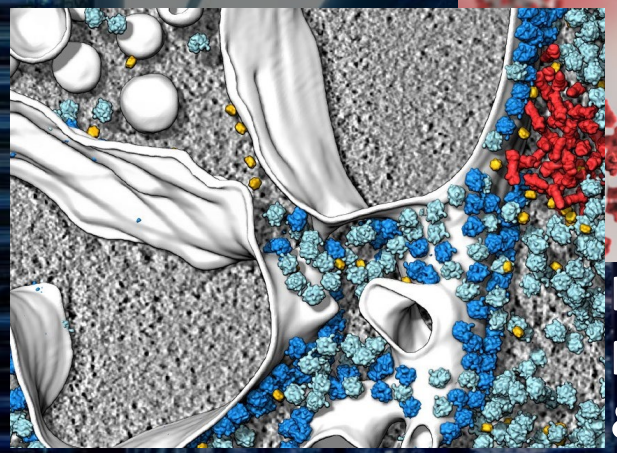
Justify use of energy and natural resources

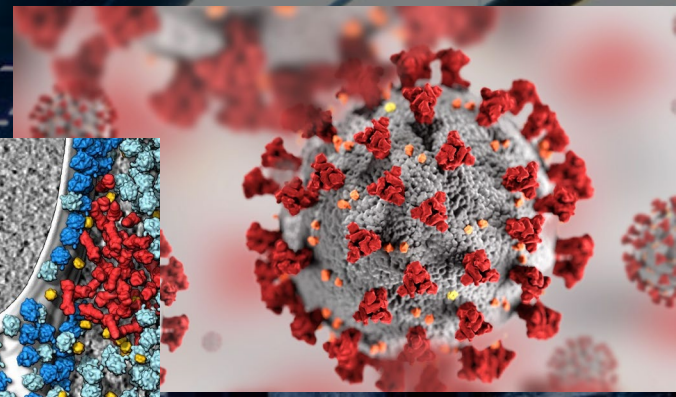
Estela Suarez
18.03.2024, Antwerpen

JÜLICH Forschungszentrum | JÜLICH SUPERCOMPUTING CENTRE



Climate modeling & weather prediction

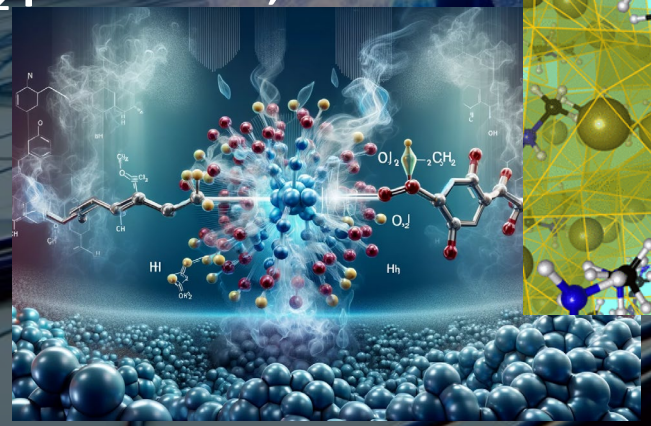


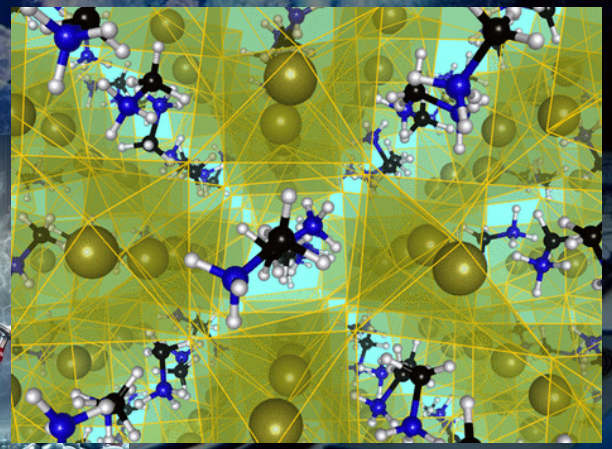


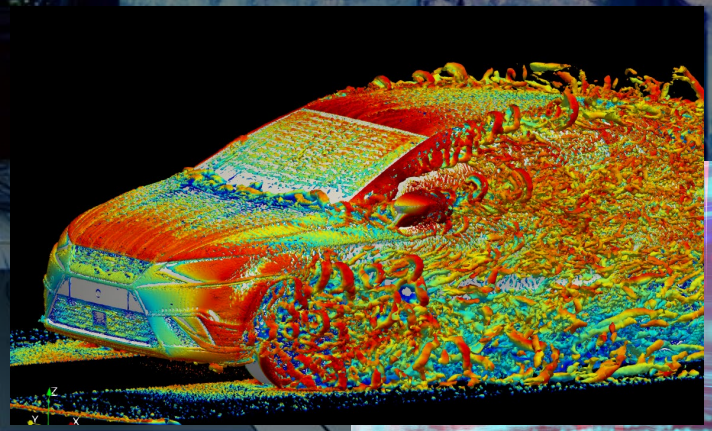
Life science: Pharmaceutical design & whole-cell modeling

Impact: Data & Software is the key frontier

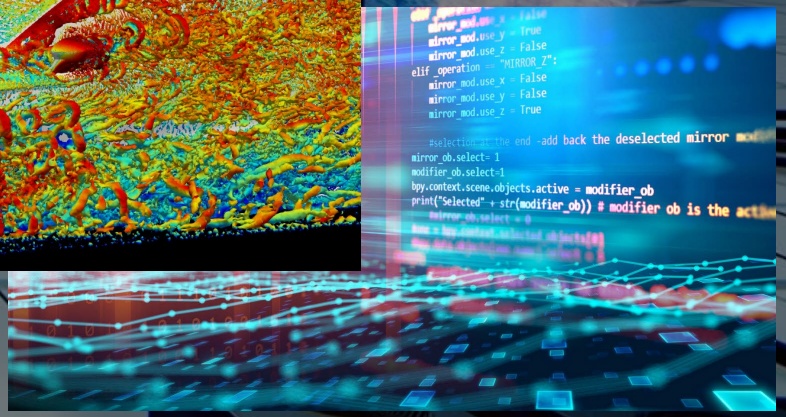
Material science: H_2 production, solar cells







Engineering, CFD, Data analytics



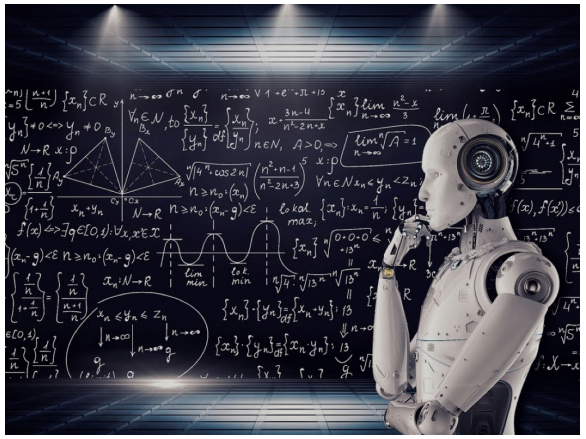
We need Manhattan-scale projects focused on solving societal problems

Some post-exascale challenges

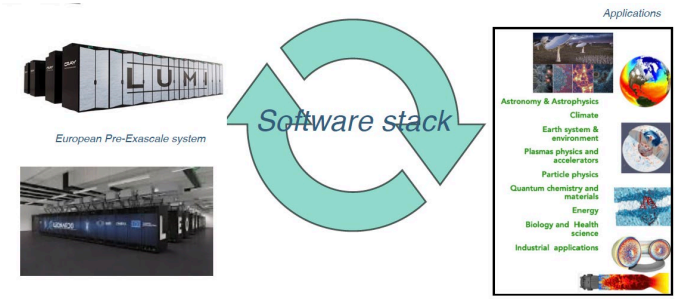
From edge to HPC systems
The digital continuum

International collaboration is key - The International Post-Exascale project (InPEx)

AI4Science – Science4AI



Software/application co-design



Need for a proper European agenda **– InPEx-EU**

Software, the new frontier

CHALLENGES TO BE ADDRESSED FOR THE NEXT GENERATION/POST-EXASCALE OF HPC

Fabrizio Del Maffeo, CEO & Co-Founder Axelera AI

1) SCALING COMPUTING POWER

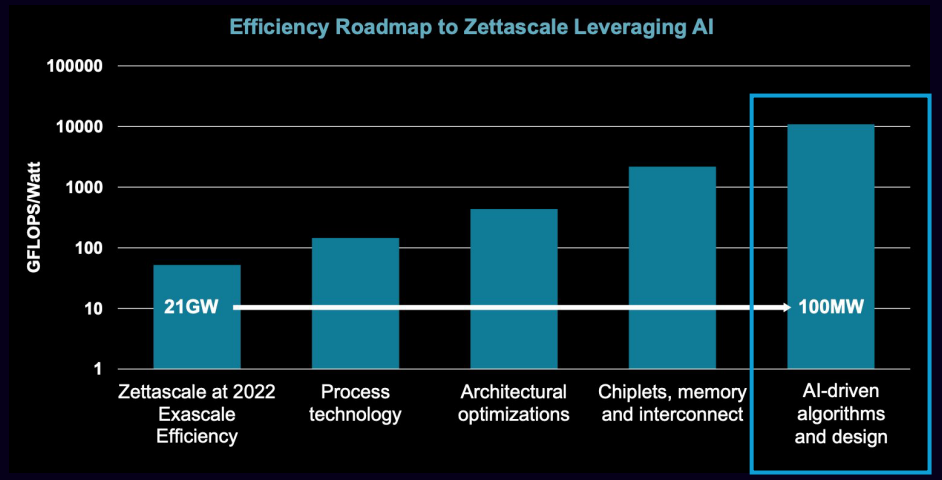
Classical computing doesn't allow to scale easily to Zettascale, we need an hybrid approach with classical computing and AI

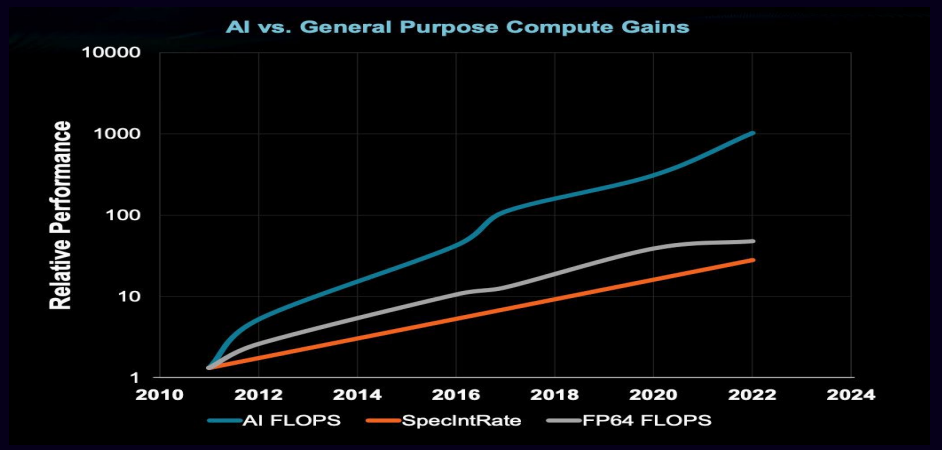
2) WORKING AT LOWER COMPUTING PRECISION

Lower precision computing (FP32/16/8) and machine learning to solve classical AI workload

3) EU SOVEREIGNTY IN COMPUTING (HPC / AI)

It requires a very ambitious plan and a strong sense of urgency

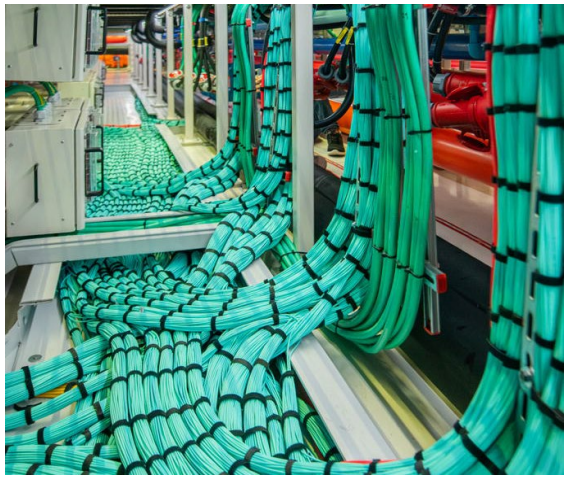


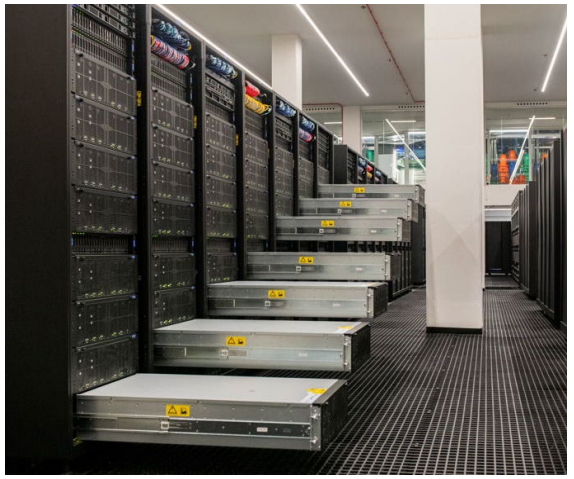


Lisa Su, Plenary Session, ISSCC 2023, Feb

EuroHPC Joint Undertaking

AXELERA ARTIFICIAL INTELLIGENCE




Challenges in HPC after exascale (some of them)

Sergi Girona
Barcelona Supercomputing Center

March 18, 2023