NEW HPC STRATEGIES AND ARCHITECTURES

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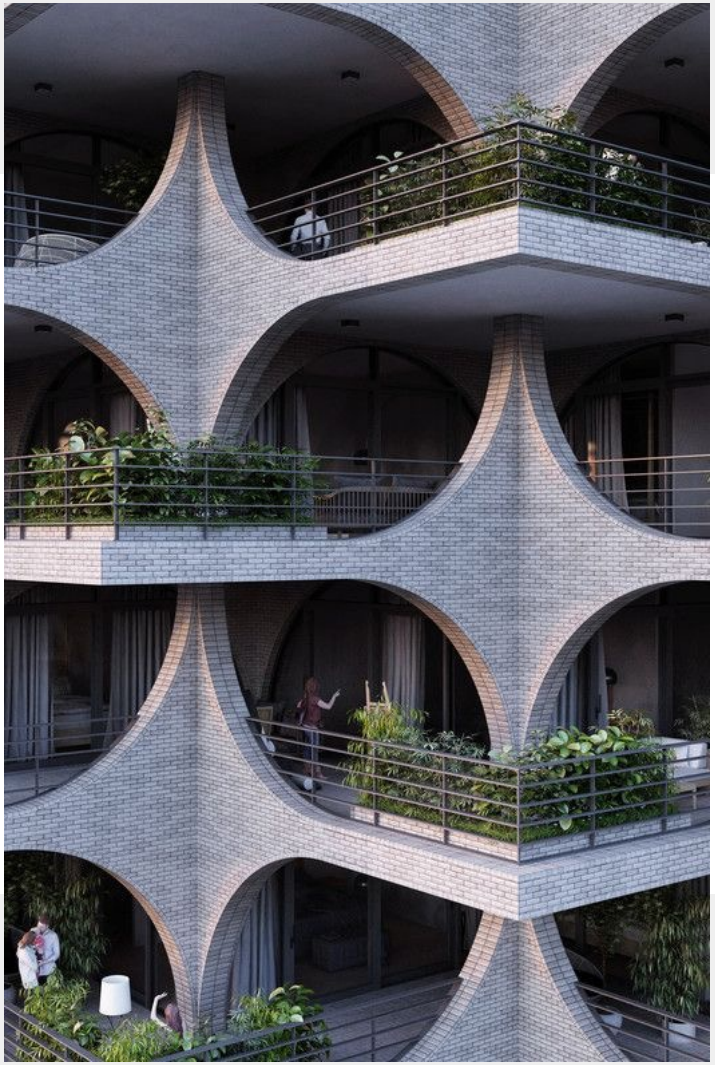
ICES SUMMIT 2022, GENEVA



Top of the pyramid

	1 	2 	3 
Systems	FRONTIER –US 1.6 Eflops, 8M cores, HPE-AMD (CPU-GPU)	FUGAKU -JP 0.54 Eflops, 7M cores Fujitsu ARM	LUMI -FI-EU 0.25 PElops, 1.1 M cores HPE-AMD (CPU-GPU)
Gordon Bell Finalists 2022	*2.5 million-atom ab initio electronic-structure simulation of complex metallic heterostructures with DGDFT* University of Science and Technology China Supercomputer: OceanLight	*Exaflops biomedical knowledge graph analytics* Oak Ridge National Laboratory Supercomputer: Frontier	*Extreme-scale earthquake simulation with uncertainty Quantification* University of Tokyo Supercomputer: Fugaku

What is happening in EUROPE?

EuroHPC

Comprehensive program from infrastructure, processor dvt and application dvt

UK

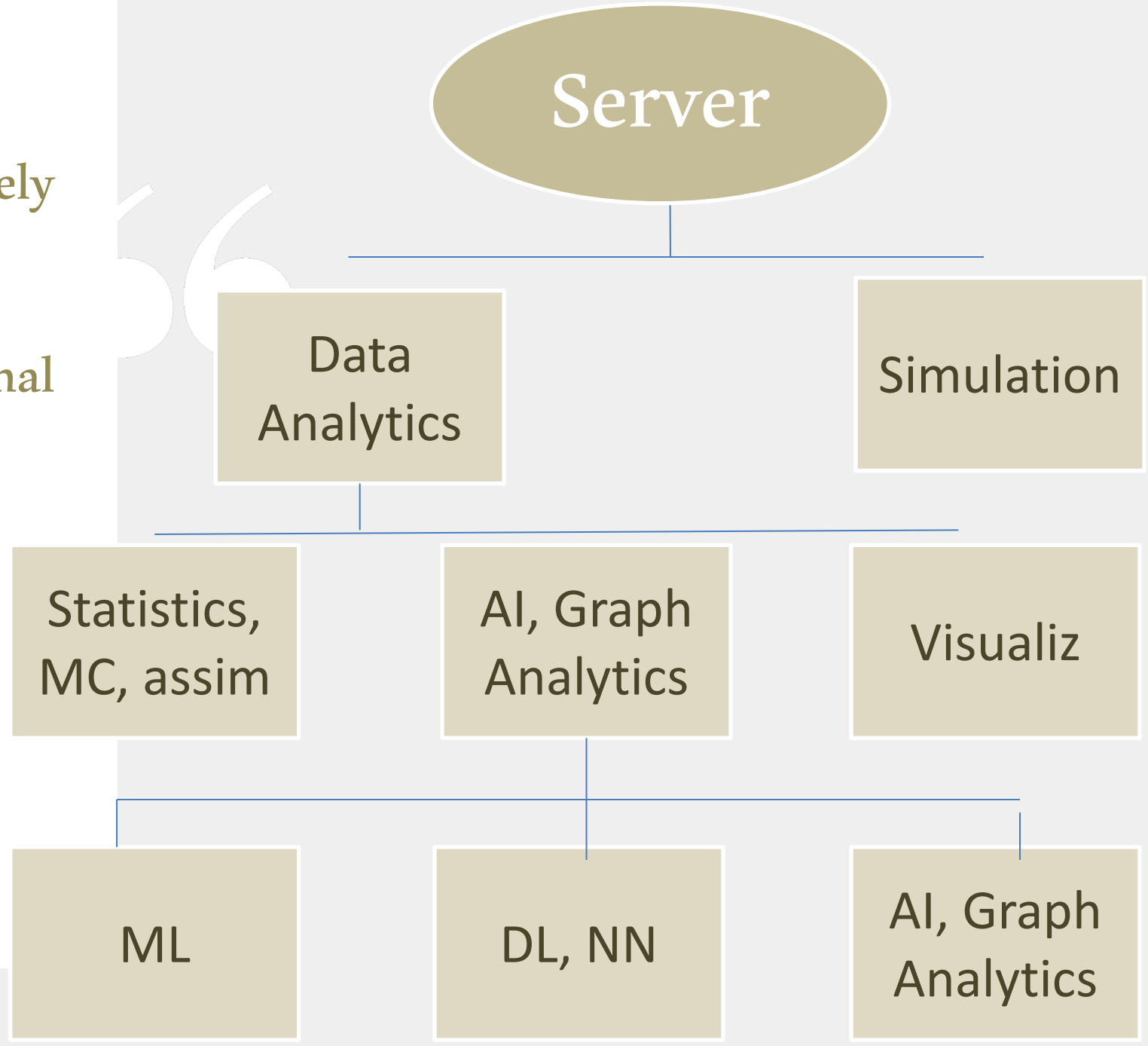
ARCHER 2, EPCC, 500 k cores, 25 Pflops

Cambridge-1, Health Science Nvidia with partners AstraZeneca, GSK,

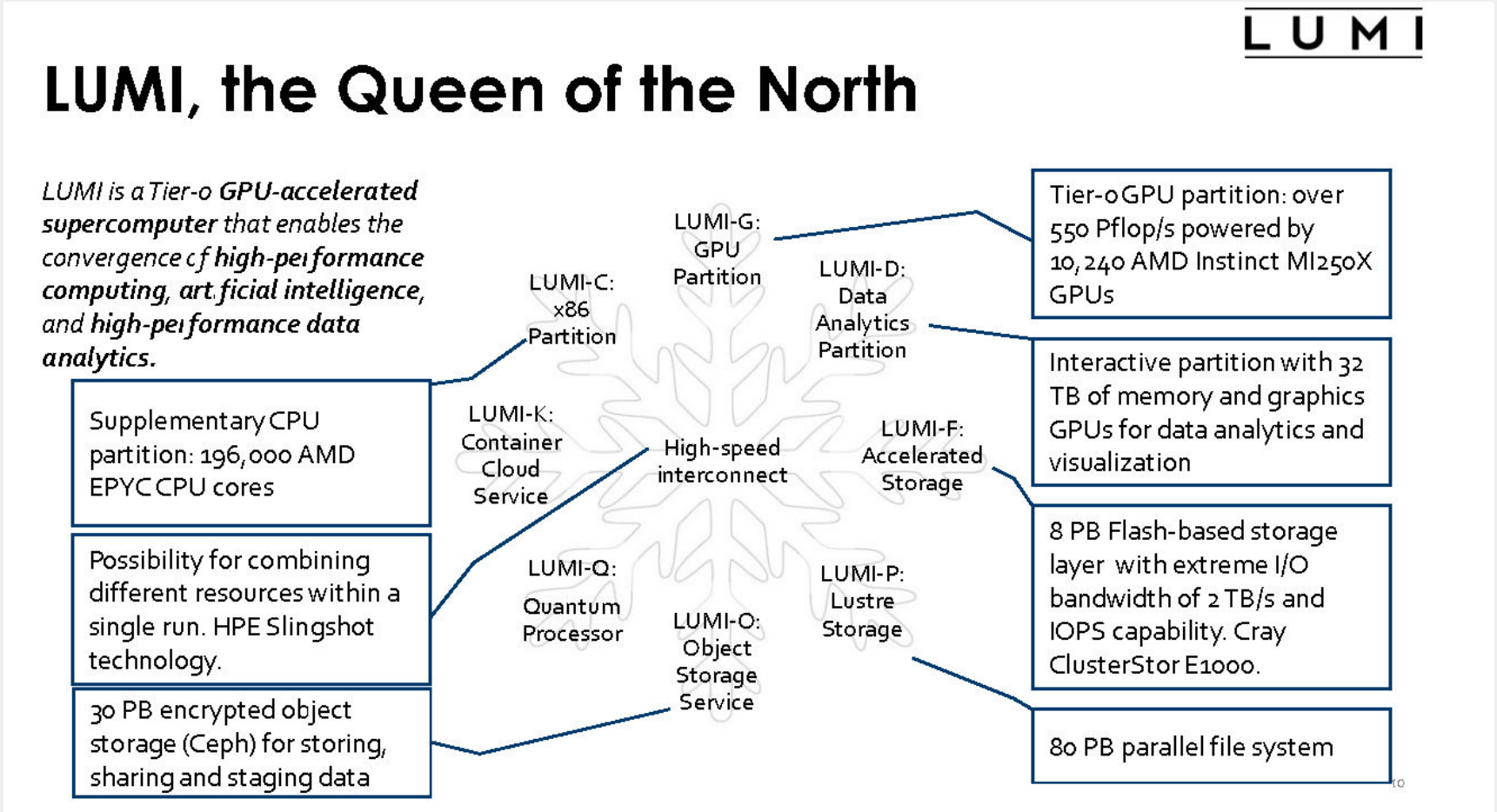
Intel new fabs and research labs in Europe

Germany, Ireland, France, Italy

HPC has largely become multifunctional

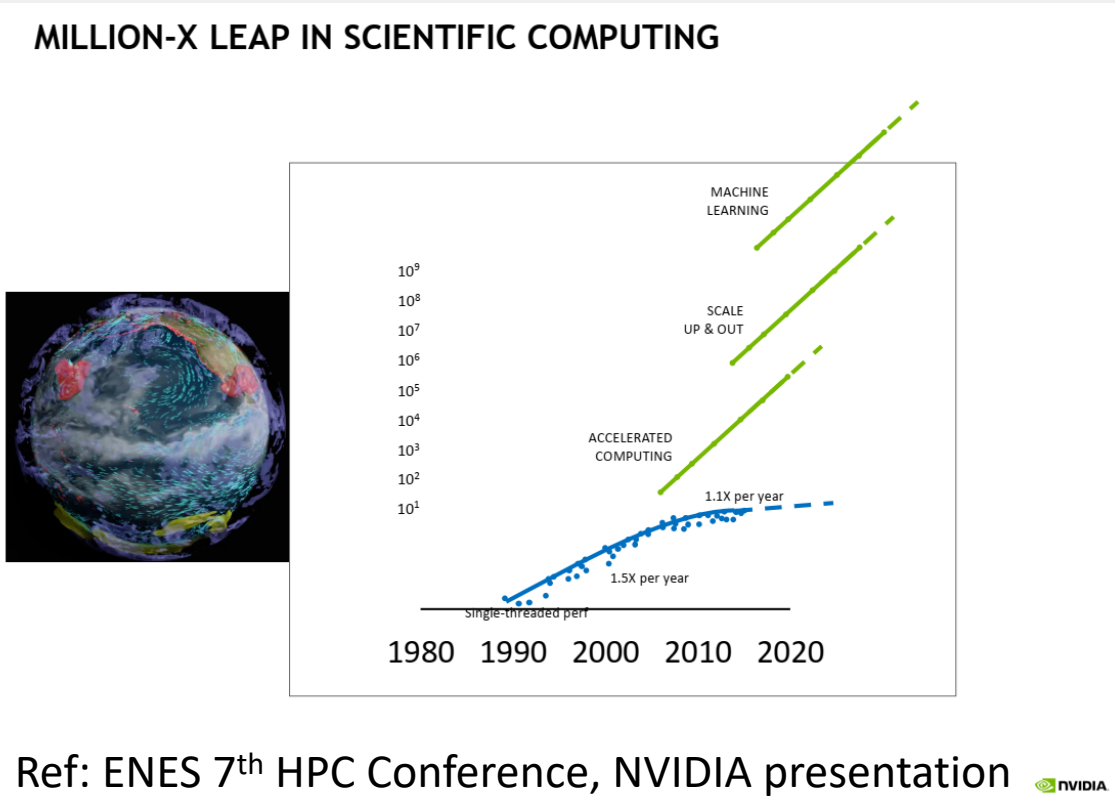


Complexity and modularity



Earth Sciences requires a leap of O(10**6)

How are we going to achieve this?



Ref: ENES 7th HPC Conference, NVIDIA presentation

How to go beyond the present limit?

- Neuromorphic Computing
- Graphene-based transistors
- Optical computing
- Quantum Computing
- DNA data storage
- …..