

Introduction to the Oak Ridge Leadership Computing Facility (OLCF)

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SIAM CSE21: Hands-on with the Summit Supercomputer

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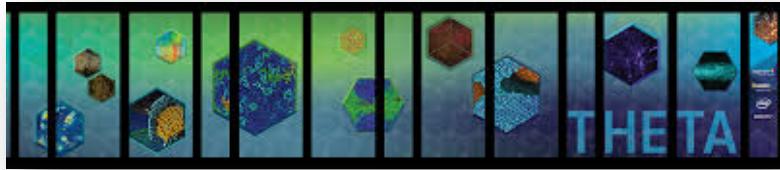
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Agenda

When (CST)	What
2:15 PM – 2:20 PM	Welcome
2:20 PM – 2:30 PM	Intro to the Oak Ridge Leadership Computing Facility (OLCF)
2:30 PM – 2:45 PM	Intro to the Summit supercomputer
2:45 PM – 3:15 PM	Using the Summit supercomputer
3:15 PM – 3:55 PM	Hands-on challenges
3:55 PM – 4:15 PM	Break
4:15 PM – 5:50 PM	Hands-on challenges (continued)
5:50 PM – 5:55 PM	Closing remarks

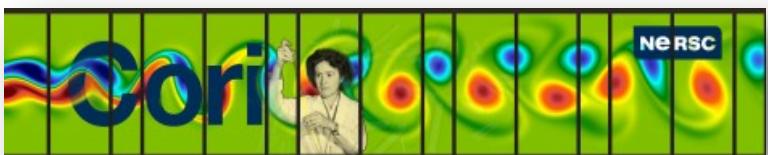
We are one of the DOE's Office of Science computation user facilities



Argonne Leadership Computing Center



Oak Ridge Leadership Computing Center



- DOE is leader in open high-performance computing
- Provide the world's most powerful computational tools for open science
- Access is free to researchers who publish
- Boost US competitiveness
- Attract the best and brightest researchers

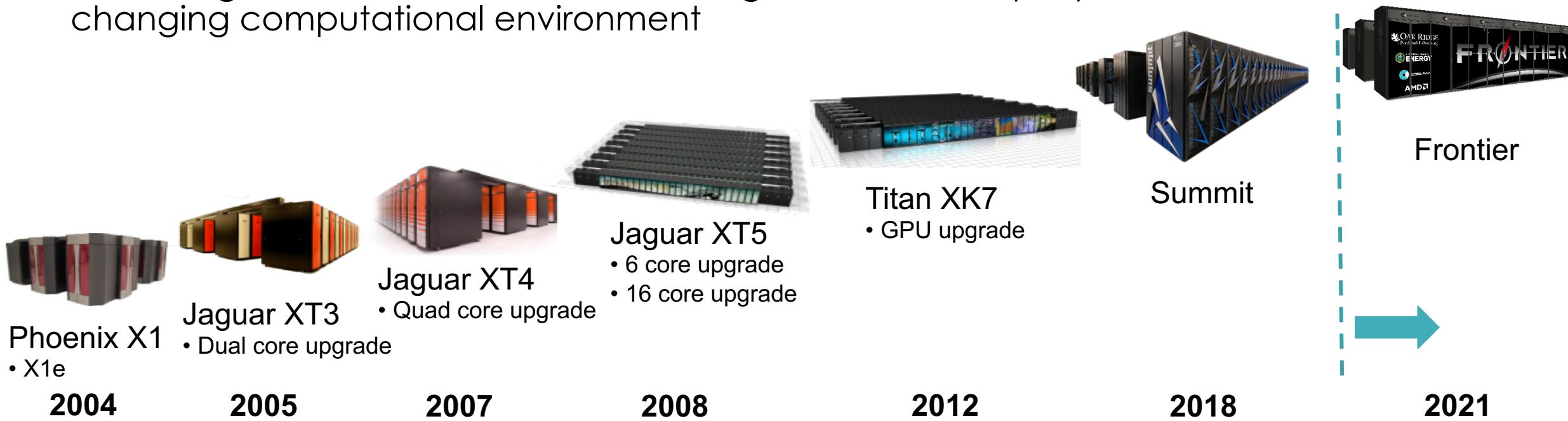
What is a Leadership Computing Facility (LCF)?

- Collaborative, multi-lab DOE initiative (2 centers / 2 architectures)
- Mission: Provide an ecosystem that enables capability computing opportunities to solve the most challenging problems.
- Administer and support two highly competitive user allocation programs
 - Innovative and Novel Computational Impact on Theory and Experiment (INCITE)
 - ASCR Leadership Computing Challenge (ALCC)
 - Computational allocations typically 100x larger than generally available in university, laboratory, and industrial (scientific and engineering) environments.



The OLCF has Successfully Delivered Six Systems Since 2004

- Frontier will be system number seven and will provide an increased capability of over 80,000x
- Large part of success has been strong user partnerships to scale & refactor codes/methods
- Partnering has been essential to delivering science in a rapidly changing computational environment



Summit IBM AC922

Specifications and Features

- Processor: IBM Power9™ (2/node)
- GPUs: 27,648 NVIDIA Volta V100s (6/node)
- Nodes: 4,608
- Node Performance: 42TF
- Memory/node: 512GB DDR4 + 96GB HBM2
- NV Memory/node: 1600GB
- Total System Memory: >10PB DDR4 + HBM + Non-volatile
- Interconnect Topology: Mellanox EDR 100G InfiniBand, Non-blocking Fat Tree
- 250 PB GPFS – aggregate read/write of 2.5 TB/s
- Peak Power Consumption: 13MW





Questions?