Introduction to Mira

Susan Coghlan

Argonne Leadership Computing Facility

Argonne National Laboratory

BG/Q Summit

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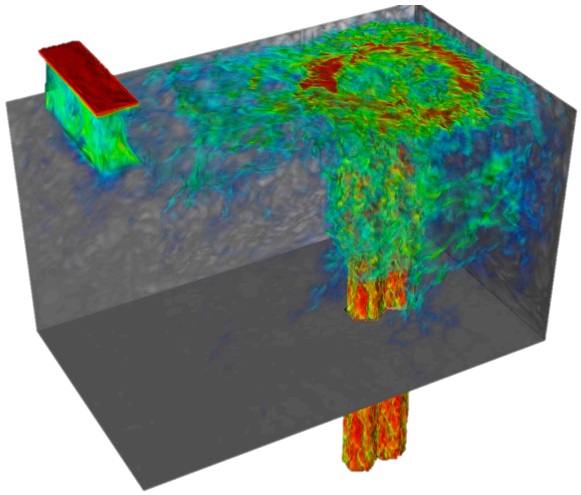
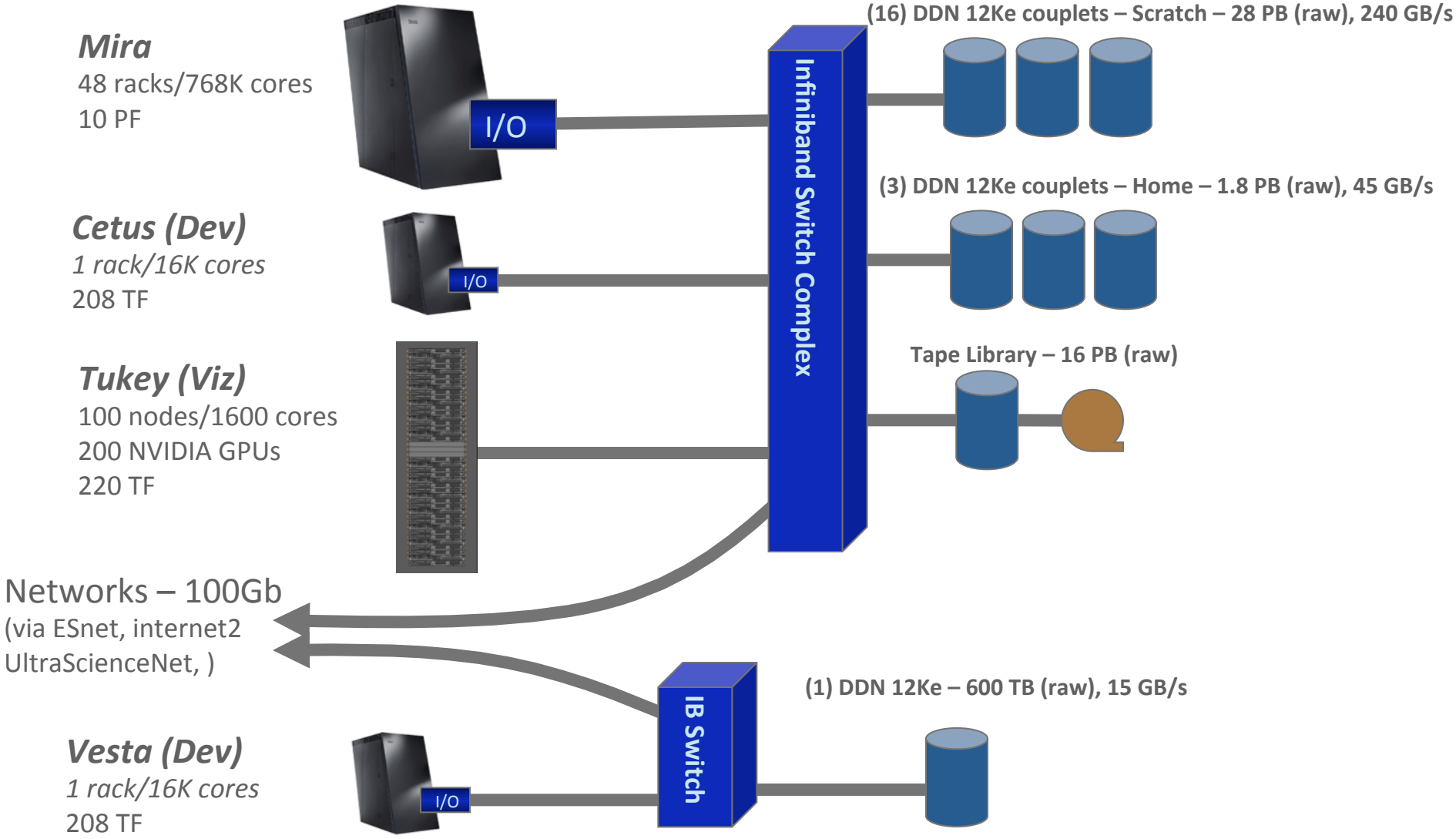
Mira: Latin: to wonder at, wonderful; causing one to smile

ALCF new resources

- ***Mira* – BG/Q system**
  - 49,152 nodes / 786,432 cores
  - 786 TB of memory
  - Peak flop rate: 10 PF
  - Linpack flop rate: 8.1 PF
- ***Cetus & Vesta (T&D)* - BG/Q systems**
  - 2,048 nodes / 32,768 cores
  - 32 TB of memory
  - Peak flop rate: 416 TF
- ***Tukey* – Nvidia system**
  - 100 nodes / 1600 x86 cores/ 200 M2070 GPUs
  - 6.4 TB x86 memory / 1.2 TB GPU memory
  - Peak flop rate: 220 TF
- **Storage**
  - Scratch: 28.8 PB raw capacity, 240 GB/s bw (GPFS)
  - Home: 1.8 PB raw capacity, 45 GB/s bw (GPFS)
  - Storage upgrade planned in 2015



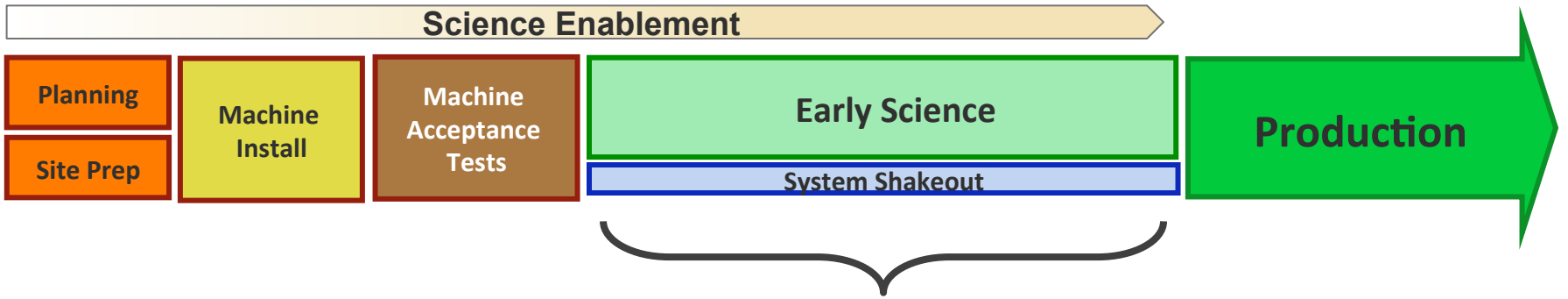
ALCF new resources



Standard HPC software

- **Compilers**
  - IBM XL
  - GNU
- **Libraries**
  - Math
  - I/O
- **Resource manager**
  - Cobalt
  - qsub, qstat, etc.
- **Tools**
  - Debuggers
  - Profilers
- **Not many commercial packages**

Standard high-level timeline



Preproduction use by
"Early Science" Users

Timeline for Mira availability

2012 Timeline

- T&D racks available for early users Feb 2012
- Mira installation completed July 2012
- Mira Phase 1 acceptance (24 racks) completed Sept 2012
- Mira Early Science Period (24 racks) begins 10/9/2012
- Mira currently in preparation for Phase 2 acceptance (Full system)
- Vesta GA Nov 2012

2013 Timeline

- Mira committed to go production on October 1, 2013 with 1.3B core-hours for allocation
- Start date of production time likely to happen earlier in CY 2013
- Full year of Mira is 5.9B core-hours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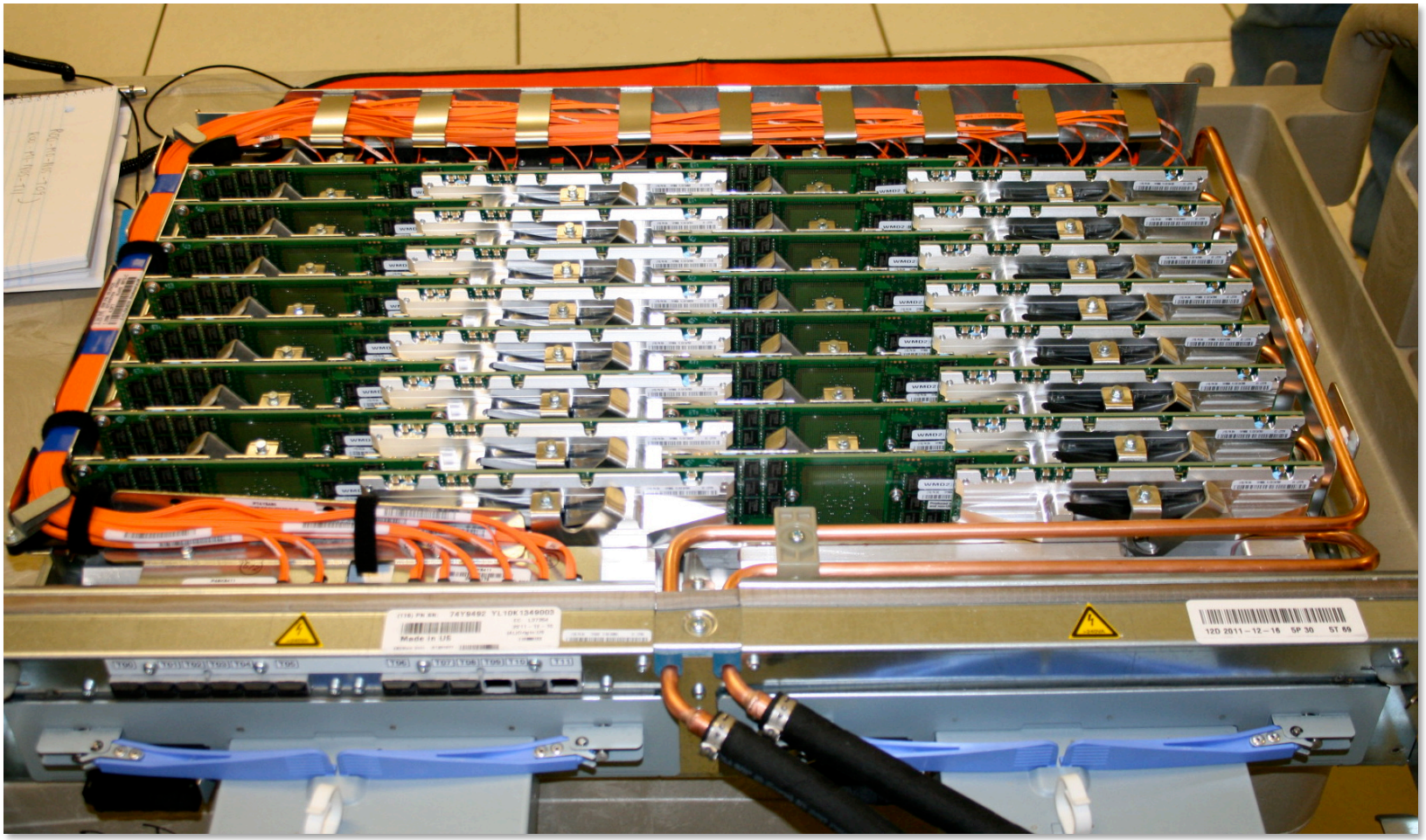
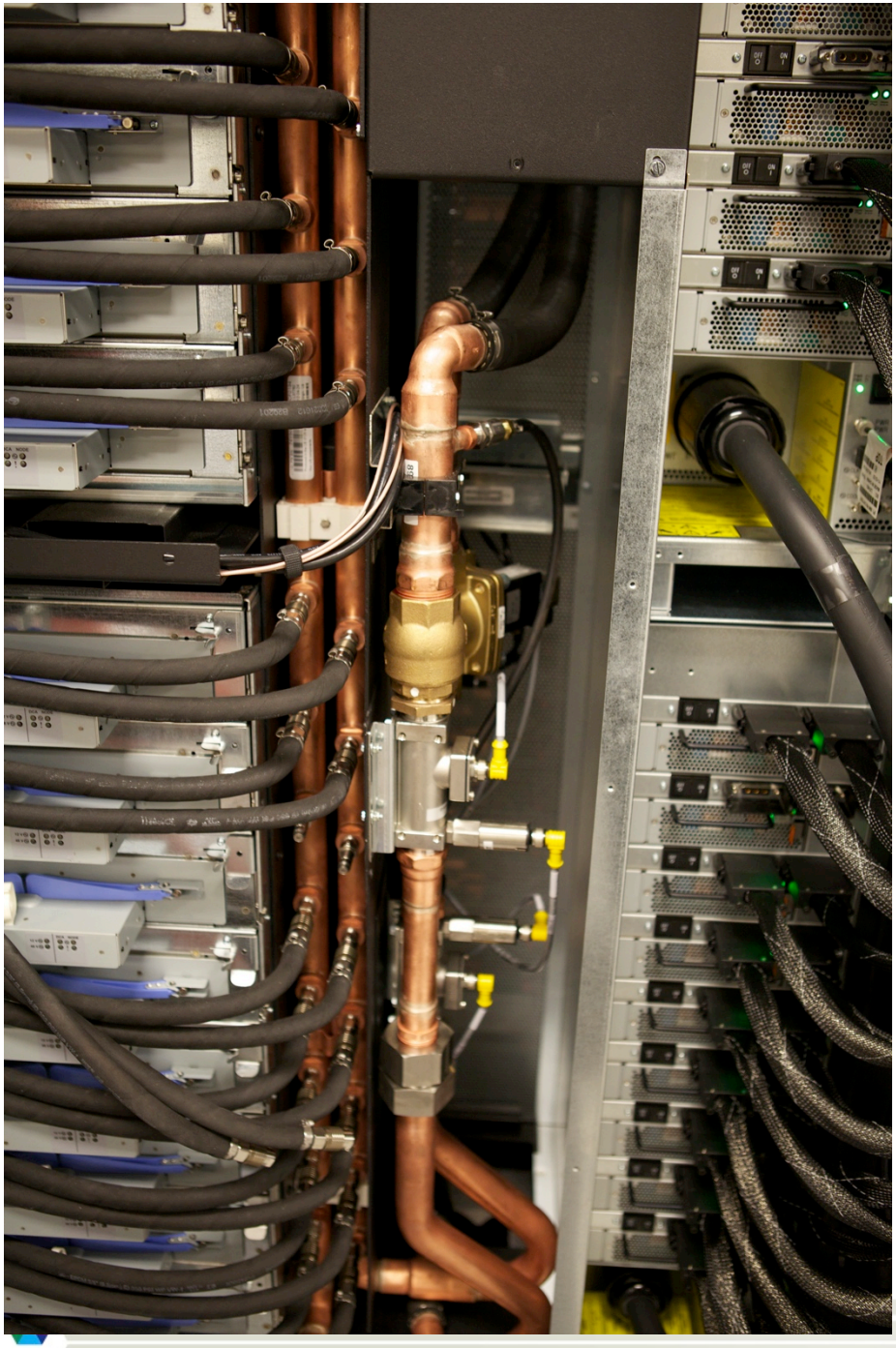
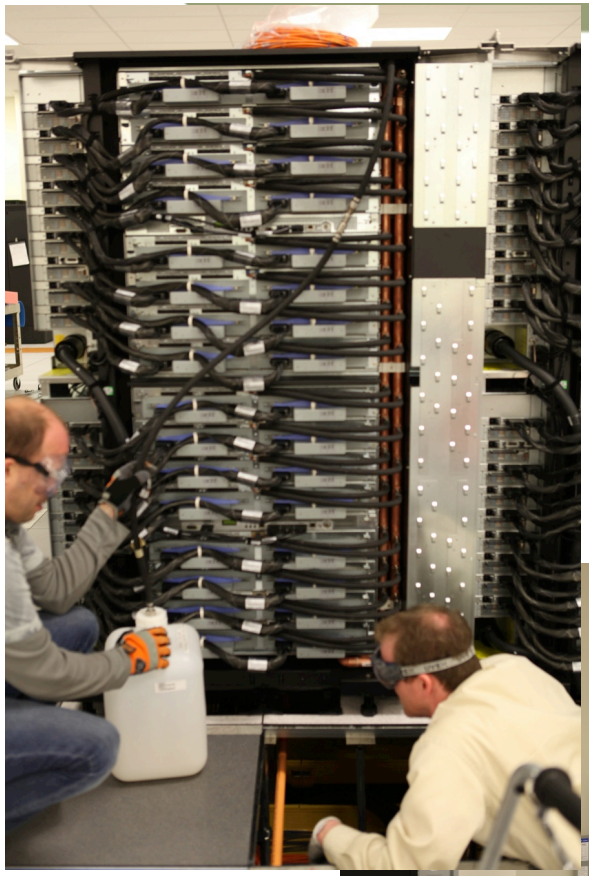

Made in UK
12D 2011-12-16 5P 30 5T 69



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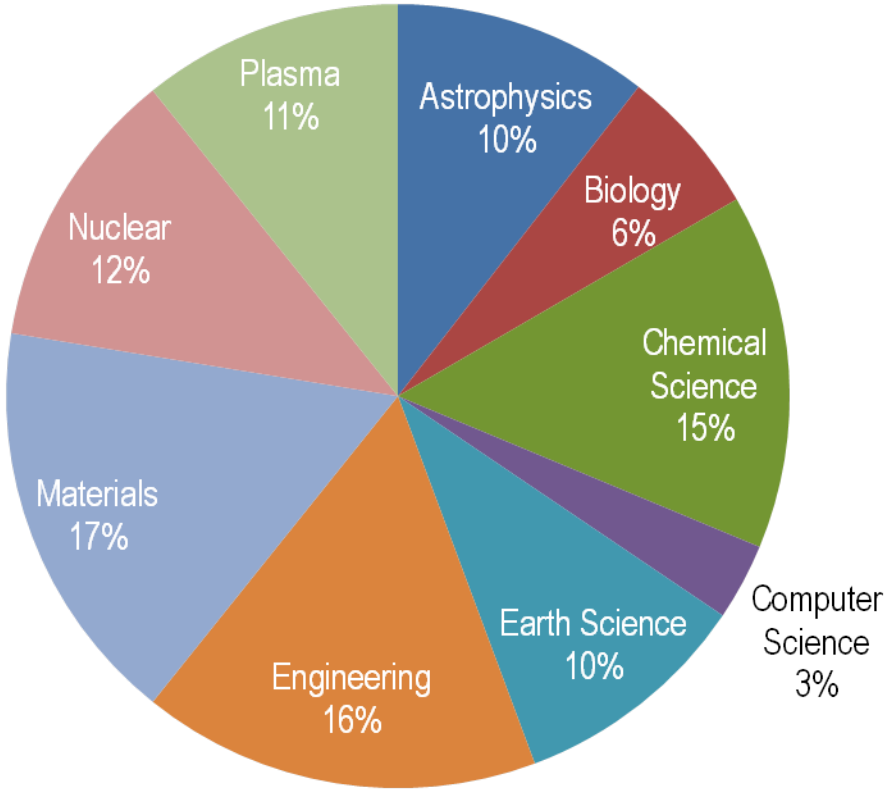
Allocation of ALCF resources

	60% INCITE		30% ALCC		10% Discretionary	
Mission	High risk, high payoff science that requires LCF-scale resources		High risk, high payoff science aligned with DOE mission		Strategic Laboratory and ASCR use	
Call	1x/year – (closes June)		1x/year – (closes February)		Rolling	
Duration	1-3 years, yearly renewal		1 year		3m, 6m, 1 year	
Sizes	20 - 40 projects	10M - 100M core hours	5 - 10 projects	1M – 75M core hours	~100s projects	0.1M - 1M core hours
		40M - 400M core hours		*4M – 300M core hours*		*0.1M - 4M core hours*
Review Process	Scientific peer review	Computational readiness	Scientific peer review	Computational readiness	Strategic impact and feasibility	
Managed By	ALCF and OLCF		ASCR program office		ALCF management	
Availability	Open to all scientific researchers and organizations		U.S. only with focus on topics of interest to the Department's energy mission		Open to all scientific researchers and organizations	

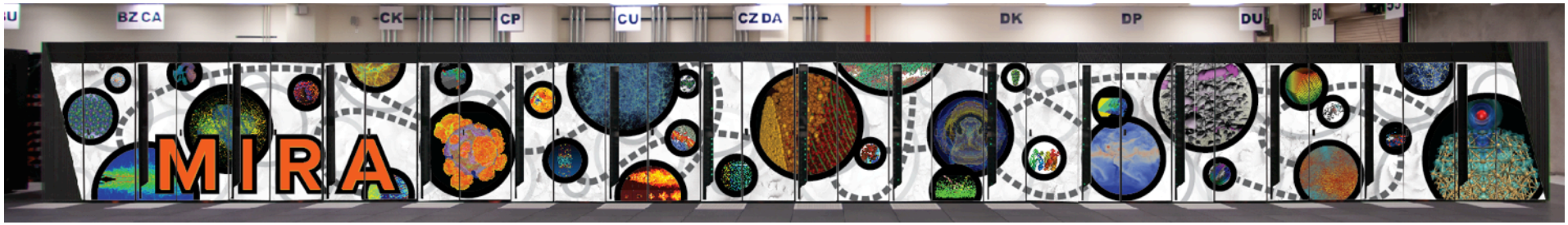
2012 INCITE allocations

28 new projects, 32 renewals

Distribution of INCITE time by science domain



Awarded 1.67 billion hours
for CY 2012


BZ CA
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MIRA