Overview of the ALCF Early Science Program

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Argonne Leadership Computing Facility

2013 MiraCon Workshop

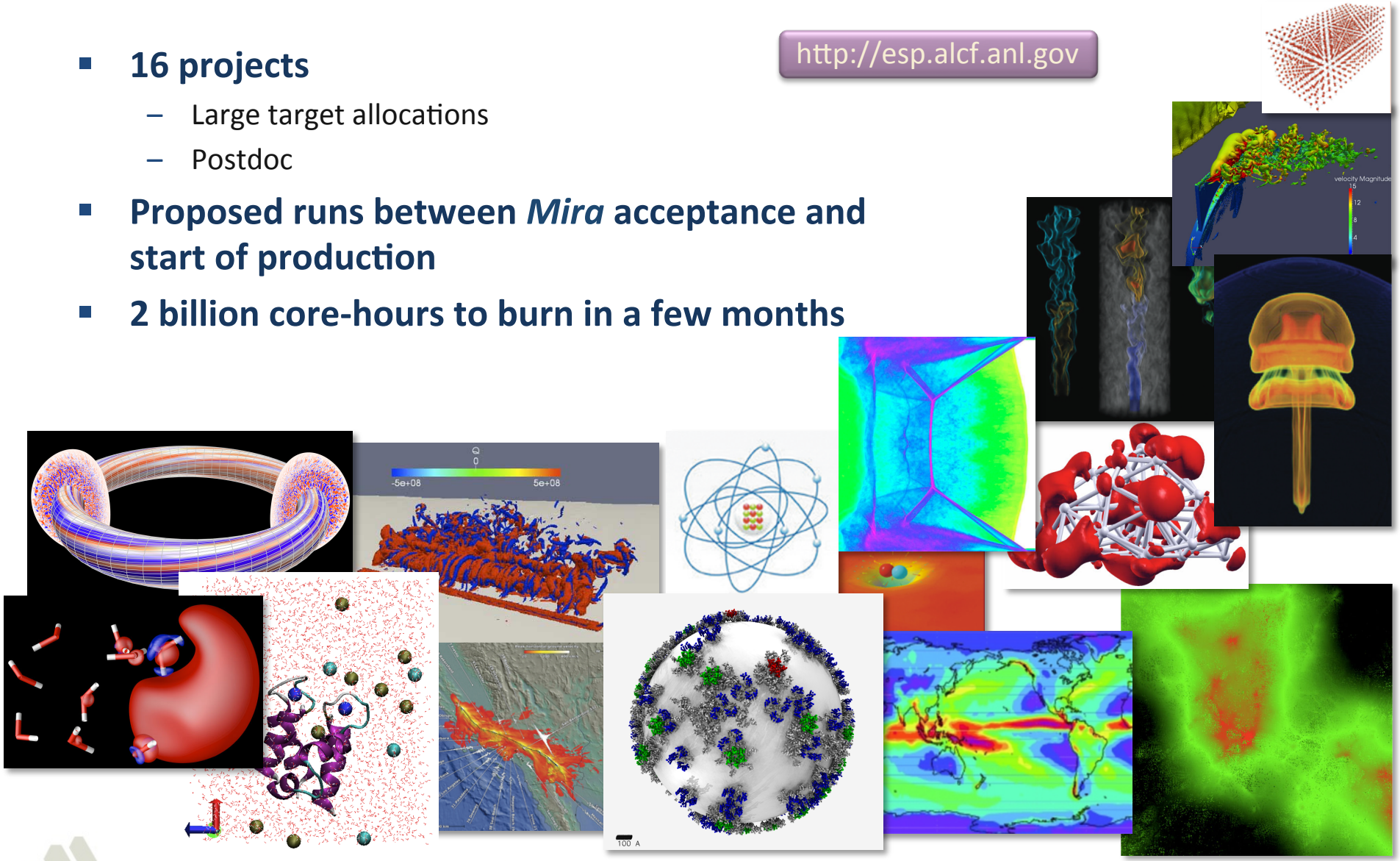
Wednesday 3/4/2013

Session: 3:45-4:30pm

First in *Mira* Queue: Early Science Program

- **16 projects**
  - Large target allocations
  - Postdoc
- **Proposed runs between *Mira* acceptance and start of production**
- **2 billion core-hours to burn in a few months**

http://esp.alcf.anl.gov



The ALCF Early Science Program

- **Motivations for ESP:**
  - Prepare key applications for the architecture and scale of Mira
  - Solidify libraries and infrastructure
  - Identify system problems
- **16 Early Science projects were chosen based on computational and scientific reviews.**
- **The projects have a running start for delivery of exciting new science**
  - Postdocs were assigned to the projects
  - ALCF staff has held four workshops for the ESP projects (including this one)
  - Before Mira was available, development was done through
    - Time on Intrepid (BG/P)
    - Some access to BG/Q systems at IBM
    - Time on VEAS, a 1-rack BG/Q Test & Development system at ALCF
    - Some access to Sequoia BG/Q system at LLNL

16 ESP Projects

Science Areas
Astrophysics
Biology
CFD/Aerodynamics
Chemistry
Climate
Combustion
Cosmology
Energy
Fusion Plasma
Geophysics
Materials
Nuclear Structure

Algorithms/Methods
Structured Grids
Unstructured Grids
FFT
Dense Linear Algebra
Sparse Linear Algebra
Particles/N-Body
Monte Carlo

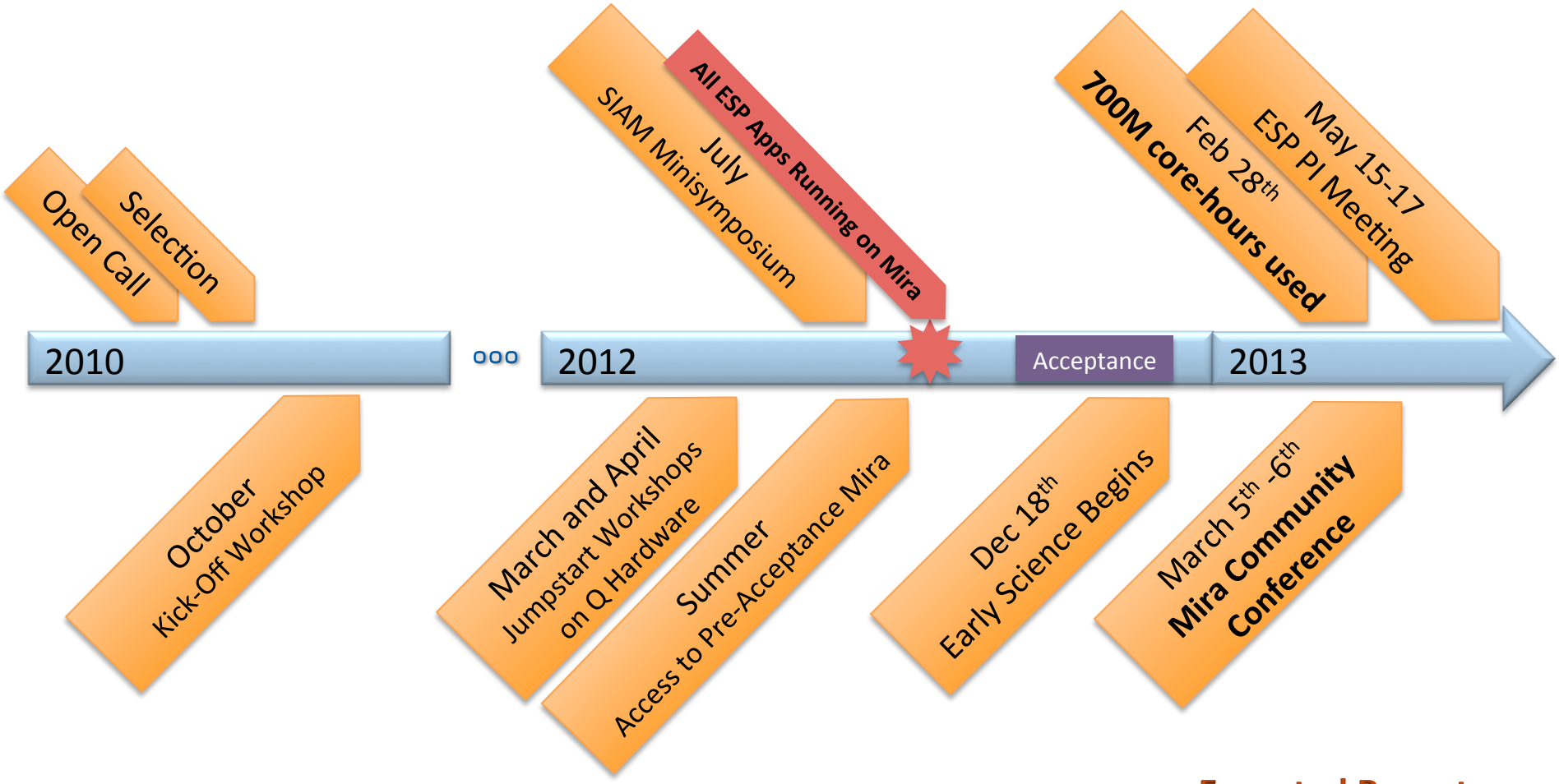
7 National Lab PIs
9 University PIs

Early Access to One-Rack Test & Dev Machine

- **Since March 2012**
- **Beta compilers & system drivers**
  - Both now production
- **Self-help via users email list and wiki**
- **Simultaneous active work on tools and libraries**

"There will be hardware and system problems."

ESP Timeline



Expected Reports

Technical Reports	Spring 2013
Science Report	Winter 2013

Agenda for ESP Presentations

Wednesday, March 6 - Day Three of MiraCon		
9:00 – 9:40	Overview of Early Science Program	*Tim Williams*
9:45 – 10:45	Session I - Threads	*Chair: TBA*
11:00 – 12:00	Session II - whole-project presentations	
12:00 – 1:00	Vendor Presentations (Lunch)	
1:00 – 2:45	Session III - Algorithms	*Chair: Graham Fletcher*
1:00 – 1:30	Allinea DDT Breakout room 1406-1407	*Ian Lumb*
3:00 – 4:30	Session IV – whole-project presentations	

Thursday, March 7 - Day Four of MiraCon		
9:30 – 12:00	Session V – Communication	*Chair: Jeff Hammond*
12:00 – 1:00	Vendor Presentations (Lunch)	
1:00 – 2:30	Session VI - whole-project presentations	
2:45 – 4:45	Session VII – Kernel Optimization	*Chair: Nichols Romero*

https://www.alcf.anl.gov/workshops/mira-community-conference