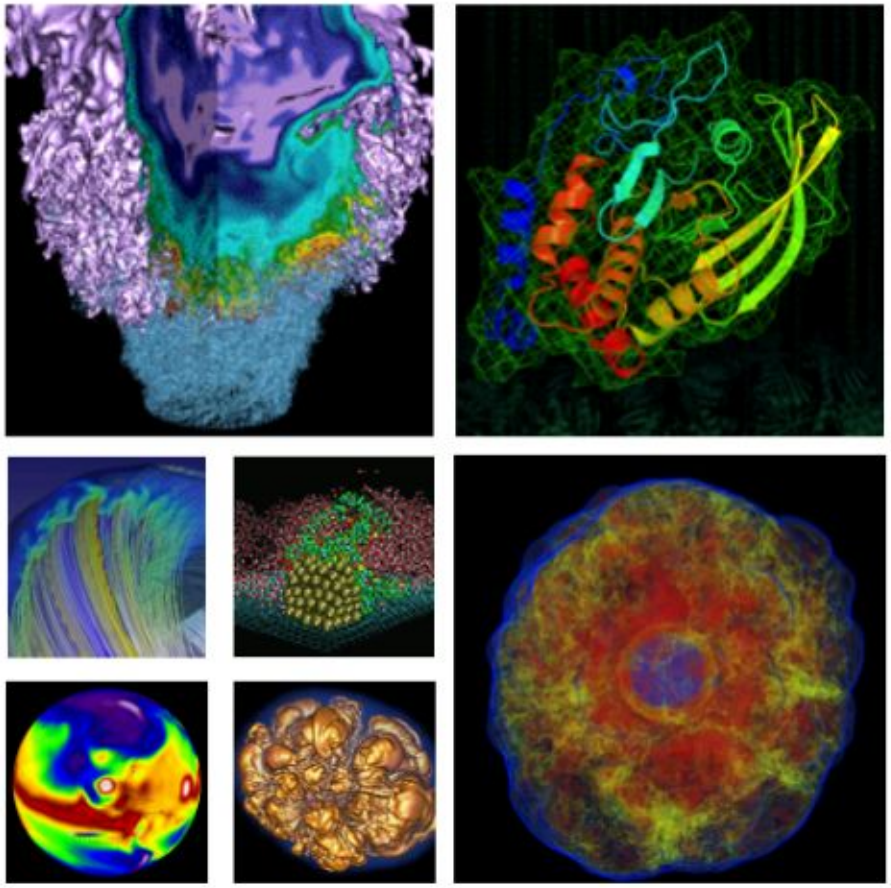
NERSC Users Group Monthly Meeting



NERSC

August 25, 2016

U.S. DEPARTMENT OF ENERGY

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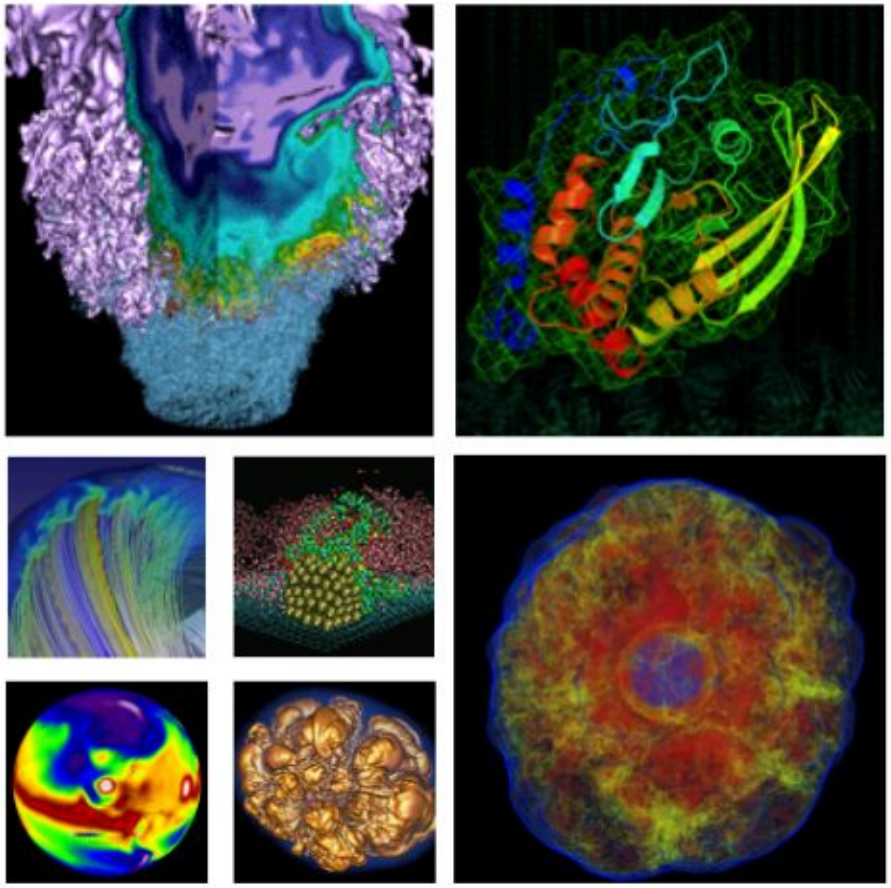
Agenda

- Cori Phase II Update
- Data Day debrief
- NESAP & resources for porting to KNL
- Edison Scratch Filesystem Updates
- AY 2017 ERCAP Allocation Requests

Cori Phase II Update



Tina Declerck

Computational Systems Group

August 25, 2016

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Agenda

- Prep for Cori Phase 2
- Cori Phase 2 Installation
  - System Arrival & Installation
  - Current Status
- Projected Timeline
- NERSC pre-merge testing
- Merge plan
- Post Merge
- Acceptance Testing

Preparation for Cori Phase 2

- **Additional Pipe work**
  - Project change early in the process
  - Completed in time for ph2 arrival
- **SMW 8.0 / CLE 6.0 upgrade**
- **SLURM**
  - Prepping software for KNL
- **Gerty**
  - Test platform with KNL
  - Allows early testing of KNL functionality

Delivery

- **System Arrival**
  - 1 day per week over 3 weeks
    - 12, 12, and 28 cabinets
    - 11 trucks

Physical Installation

- Cabinets Placed
- Plumbing & Electrical
  - Cray Site Engineering connected the system plumbing
  - Hard wire connections completed on August 4th

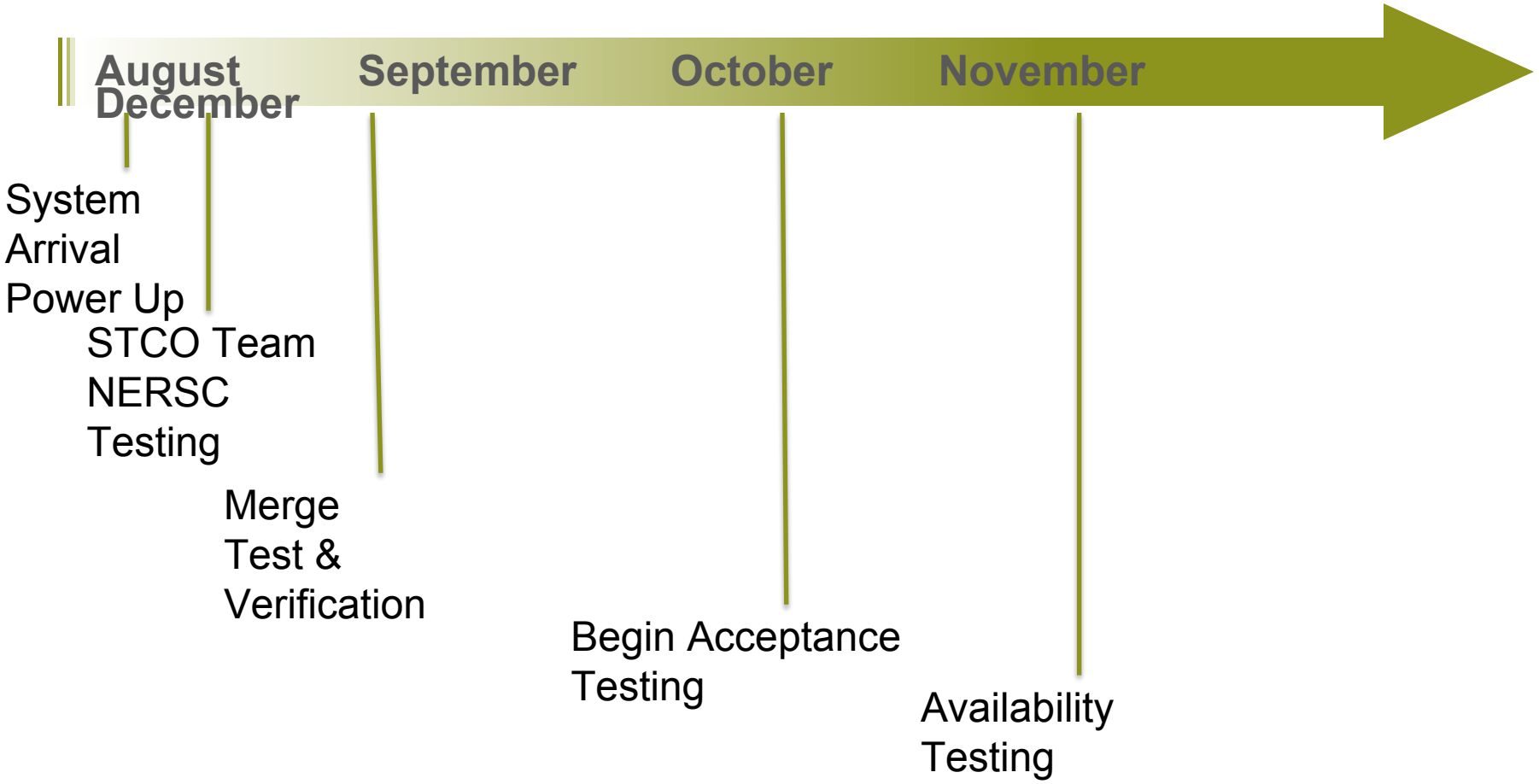
Physical Installation

- **HSN Cabling**
  - 7 days of HSN cabling; completed on August 1st.
  - Optical HSN cables are in ready to be connected to Cori Phase 1 when we merge

System Test & Check Out

- **Cray Diagnostics**
  - ~2 weeks of testing to shake out the new racks
    - Check cable connections
    - Check for bad links and replace cables
    - Check for memory and processor fallout
- **Allowed NERSC to check cooling system**
  - Ensure pumps could handle the additional load
  - Cooling sufficient for new cabinets
- **Verify Power**
  - Ensure power requirements of the KNL racks
  - HPL and mem tests put high load on the system

Projected Timeline



NERSC Pre-Merge Testing

Goal: Ensure KNL is operating well

- Run full scale KNL job
- Ensure fallout rate is within expectations
- Ability to boot nodes into different modes
- Benchmark SSP runs
- Verify UME rates
- Testing the variable blower speeds

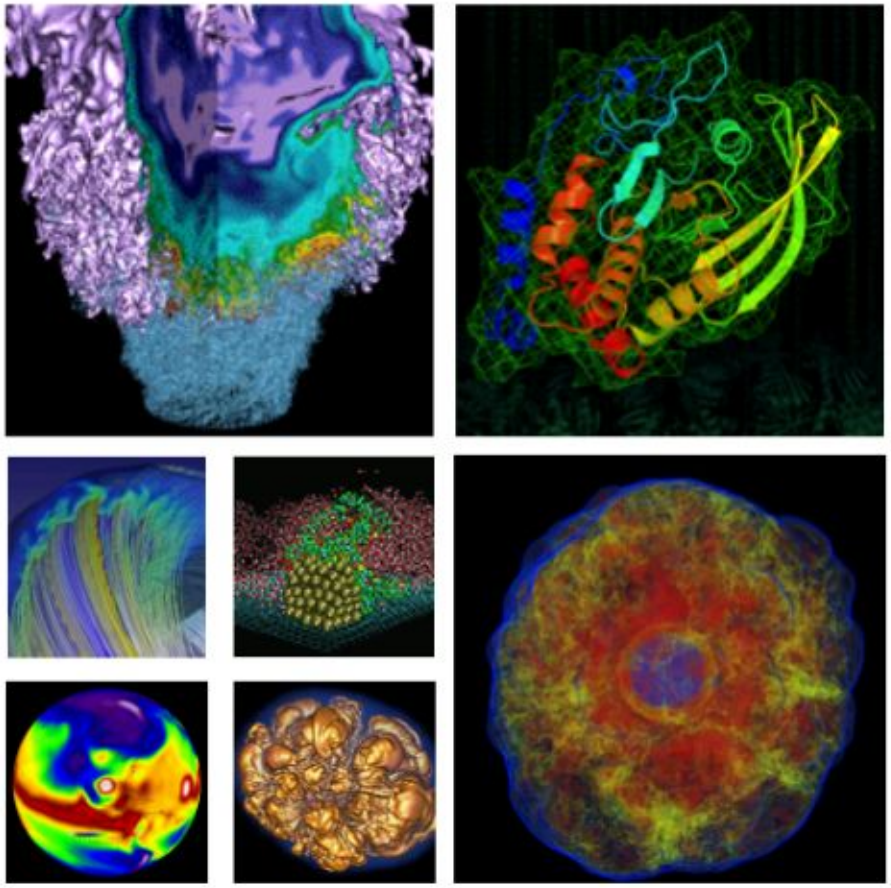
Goal: Keep the Haswell partition operating

- Verify ability to upgrade KNL
- Verify ability to update KNL bios
- Test affect on system with hardware actions

Merge Plan

- **Prepare for the merge**
  - Pre-lay cables
  - Prepare system software
- **Unconfigure current DataWarp**
- **Shutdown Cori Ph1 & Ph2**
- **Complete hardware actions (1.5 weeks)**
  - Move blades
  - Cable work
  - Connect Aries
- **Software Configuration/Updates**
  - System configuration
  - DataWarp configuration
  - SLURM configuration
  - Monitoring updates
  - Ensure latest KNL updates are installed
- **Boot and Test**

Data Day Debrief



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Annette Greiner

Data & Analytics Services Group

August 25, 2016

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Data Day 2016

72 in-person attendees

30 remote attendees

102 Total Participants

Tutorials and talks on

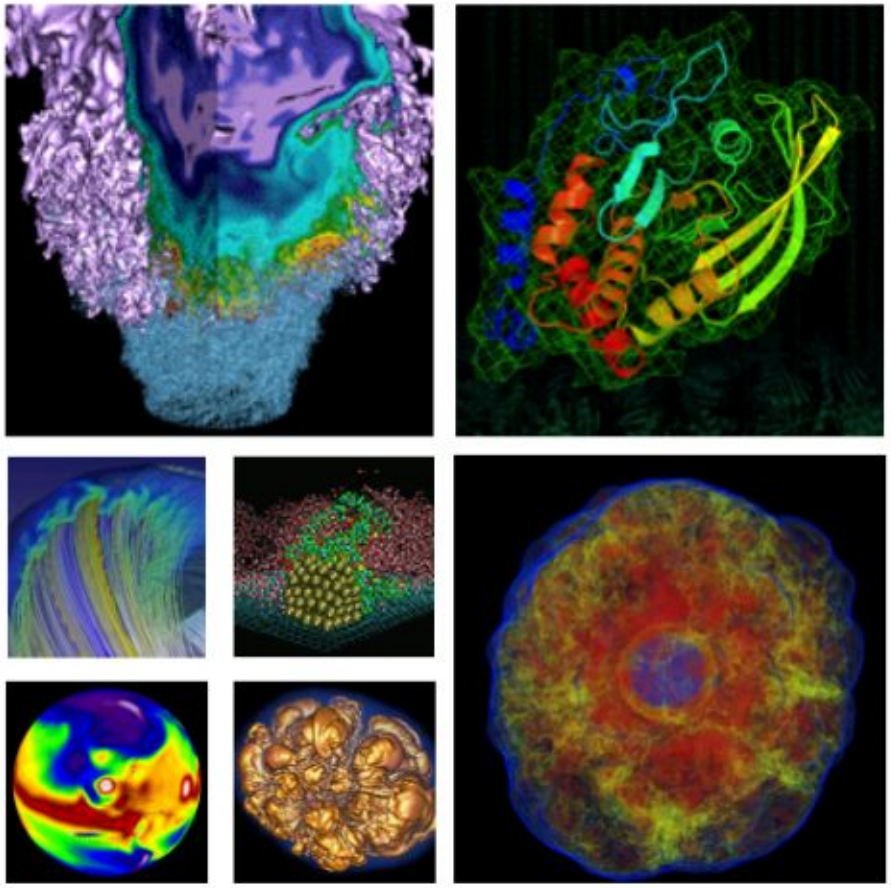
- Machine learning
- Python
- Spark
- Visualization
- Burst buffer
- Data management

Hack day on workflows with

- Spark
- Burst buffer

A big thank-you to CRAY for sponsoring Data Day!

NESAP & KNL Resources



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Brian Friesen

Application Performance Group

August 25, 2016

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Cori Phase 2 is here!

- **All 52 cabinets of Cori Phase 2 ("Knights Landing") are installed and powered on in Wang Hall!**
- **Cray is testing the machine right now**
  - They will turn it over to NERSC staff when they're done testing
- **After NERSC does our own tests, we will open it to a subset of users (NESAP) for a period of "early science" for about 12 weeks**

Cori Phase 2 is here!

- **Additional users with codes that have demonstrated readiness for KNL will get access after the NESAP teams.**
- **We anticipate that all users will have access to the system for code development and testing in early 2017.**
- **See the Cori timeline here: http://www.nersc.gov/users/computational-systems/cori/cori-phase-ii-schedule/**

Application readiness at NERSC

- **NESAP: NERSC Exascale Science Application (Readiness) Program**
- **Multi-pronged effort to prepare existing NERSC codes for energy-efficient, manycore architectures that we will likely see on exascale computers**
- **Consists of collaborations among NERSC staff, NERSC postdocs, Cray/Intel staff, and application developers (you!)**
- **Next step on the road to exascale: Cori Phase 2**

Application Readiness at NERSC

- **Components of application readiness:**
  - 8 postdocs dedicated 100% to different Tier-1 applications
  - consultants spending 20% on > 2-3 Tier-1/2 applications
  - Technical deep-dives with Intel/Cray every ~2 months
  - Training sessions with Intel/Cray
  - Early access to Knights Landing hardware
  - Knowledge transfer among Tier-1/2/3 codes and the rest of NERSC users

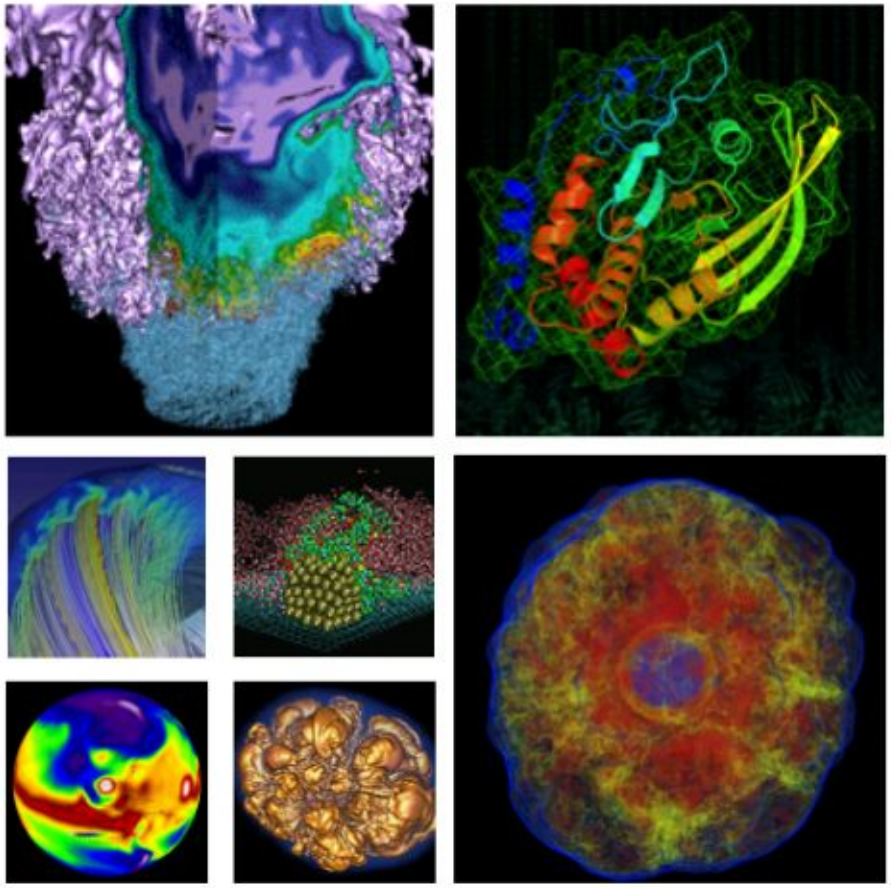
Application Readiness at NERSC

- **Resources to help you prepare your codes for Cori Phase 2:**
  - General info about Intel Xeon Phi ("Knights Landing") and Cori Phase 2: http://www.nersc.gov/users/computational-systems/cori/cori-phase-ii/
  - Application porting and performance (lots of info here!): http://www.nersc.gov/users/computational-systems/cori/application-porting-and-performance/

Application Readiness at NERSC

- **Resources to help you prepare your codes for Cori Phase 2:**
  - Application case studies:
  - http://www.nersc.gov/users/computational-systems/cori/application-porting-and-performance/application-case-studies/
  - Using the Burst Buffer: http://www.nersc.gov/users/computational-systems/cori/burst-buffer/

Edison Scratch Filesystem Updates



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Douglas Jacobsen
Computational Systems

August 25, 2016

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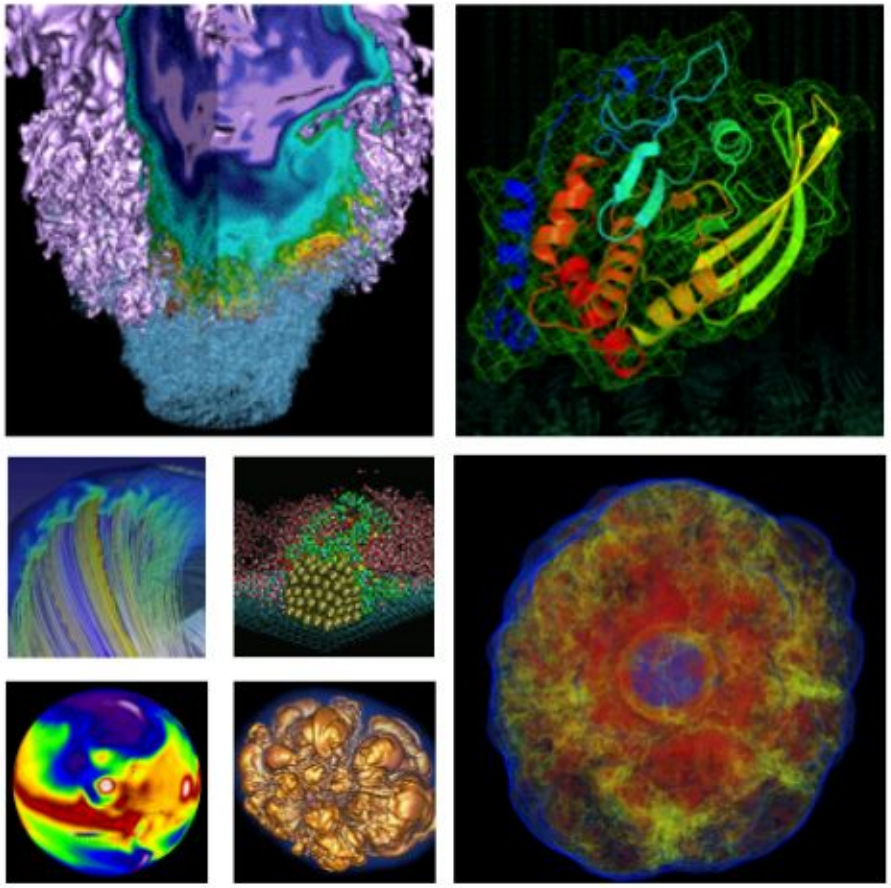
Edison $SCRATCH Update

- **Update filesystem software to latest stable version from Cray (Neo2.0update19)**
  - Performance benefits from GRIDRAID
  - Large numbers of bug fixes for performance, scalability and reliability
  - Improved manageability (owing to bug fixes)
  - Expectation of reduced load in certain areas, reducing likelihood of contention
- **Will destroy all data on /scratch1 and /scratch2**
  - Reformat to gridraid requires this

Edison $SCRATCH Update

- **Begins Monday, 08/29/2016 08:00 Pacific**
- **Will redefine $SCRATCH**
  - Will point to "/invalid/path/scratch/maintenance"
  - Jobs requesting scratch1, scratch2, or SCRATCH licenses will be held and then cancelled
  - Will attempt to identify jobs referring to $SCRATCH or ${SCRATCH} and provide an error upon submission
- **Maintenance scheduled through 9/12/2016 Noon**
- **At conclusion will resume normal definition of $SCRATCH**
- Your directory has a 50% likelihood of changing filesystems when we return to service
- **You can use cori scratch ($CSCRATCH) in the meantime**

AY 2017 ERCAP Renewals



Clayton Bagwell

User Engagement Group - Account & Allocation support

August 25, 2016

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ERCAP

"Energy Research Computing Allocations Process"

ERCAP AY 2017

All projects that wish to continue to use NERSC resources in AY 2017, must submit an ERCAP renewal request. Including:

- **DOE Production (including SciDac & CSGF)**
- **Startup**
- **Education**
- **Director's Reserve**

Submission Deadline: September 19, 2016 23:59 PDT

Note: ALCC is exempt since they run on a different allocation schedule.

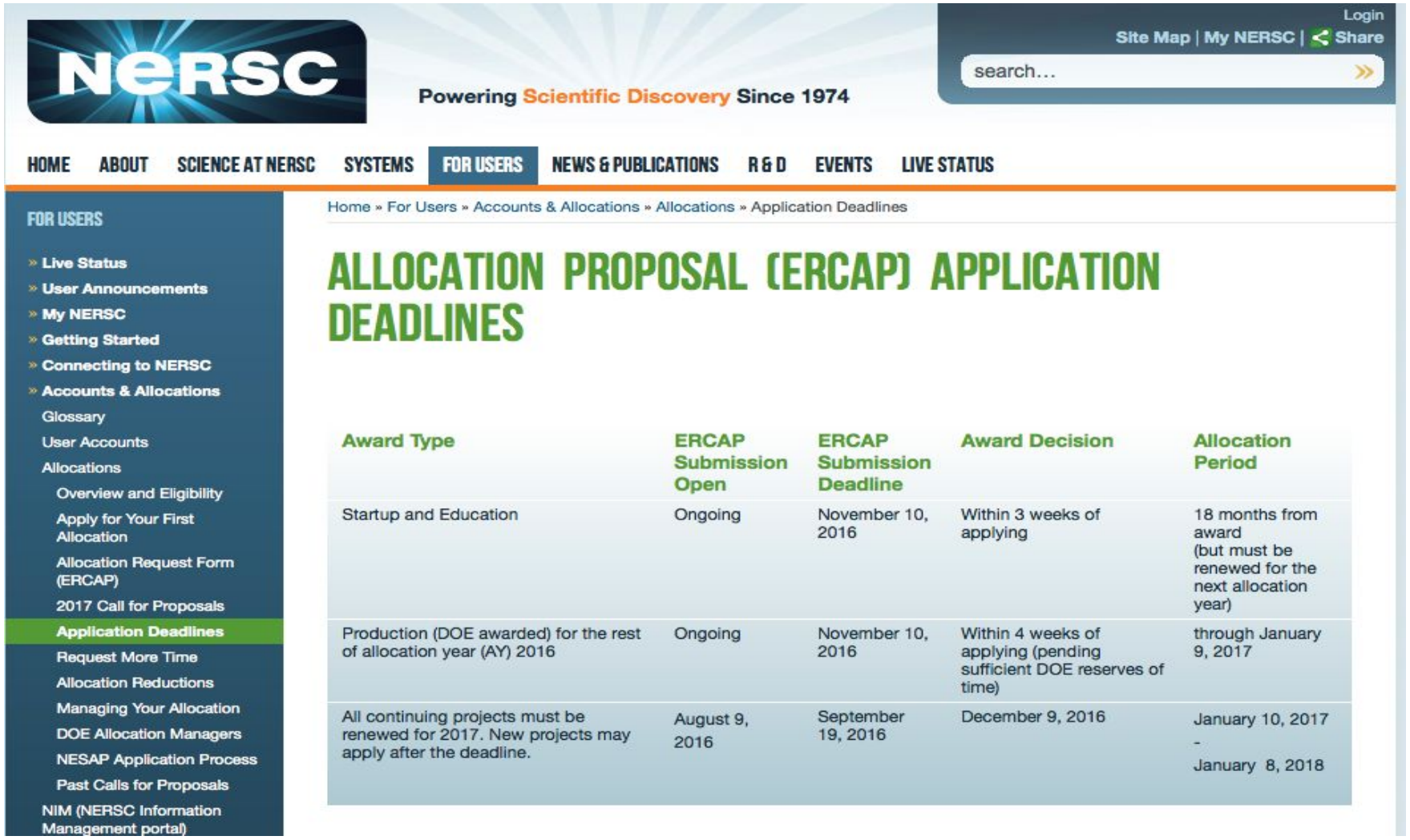
ERCAP AY 2017

Award decisions will be emailed to PIs/PI Proxies on December 9th.

ERCAP Application Deadlines

http://www.nersc.gov/users/accounts/allocations/deadlines/

ERCAP AY 2017



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- Accounts & Allocations
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- Allocations
  - Overview and Eligibility
  - Apply for Your First Allocation
  - Allocation Request Form (ERCAP)
  - 2017 Call for Proposals
  - Application Deadlines
  - Request More Time
  - Allocation Reductions
  - Managing Your Allocation
  - DOE Allocation Managers
  - NESAP Application Process
  - Past Calls for Proposals
- NIM (NERSC Information Management portal)

Home » For Users » Accounts & Allocations » Allocations » Application Deadlines

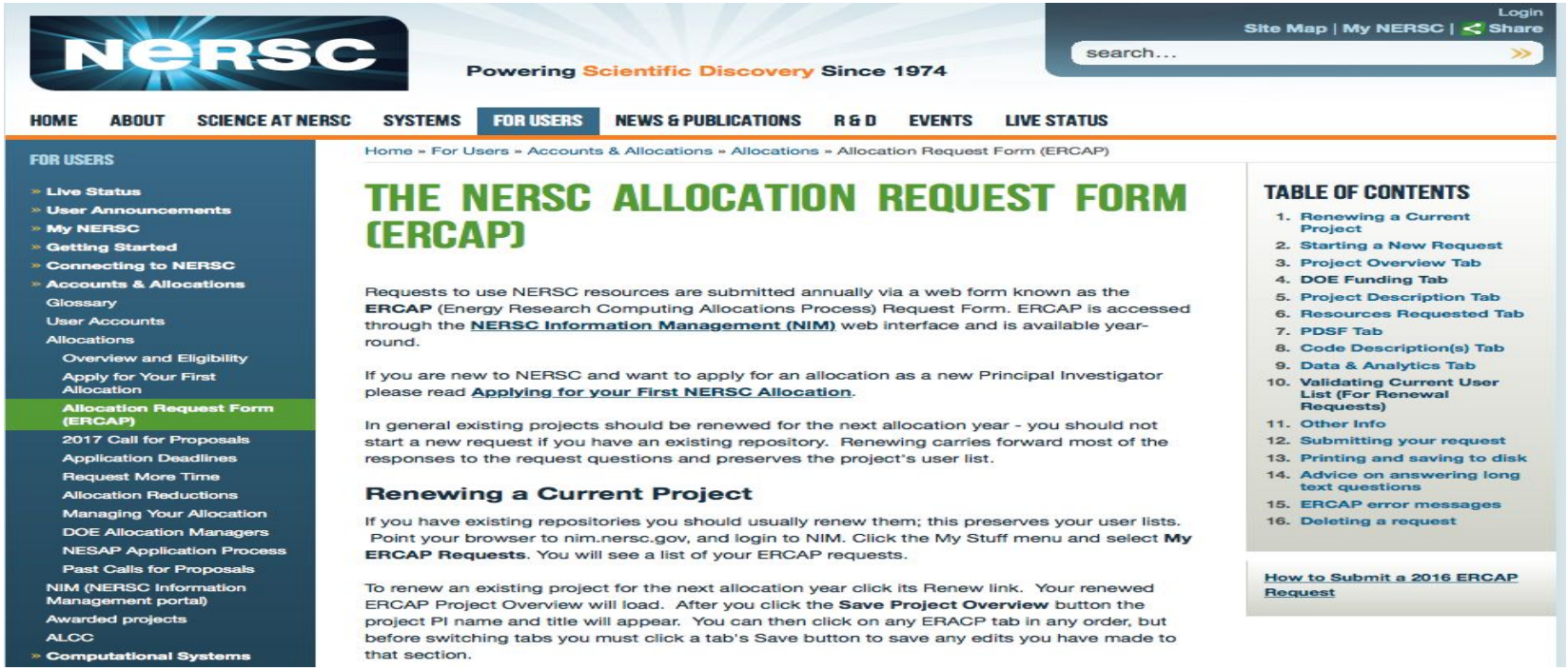
ALLOCATION PROPOSAL (ERCAP) APPLICATION DEADLINES

Award Type	ERCAP Submission Open	ERCAP Submission Deadline	Award Decision	Allocation Period
Startup and Education	Ongoing	November 10, 2016	Within 3 weeks of applying	18 months from award (but must be renewed for the next allocation year)
Production (DOE awarded) for the rest of allocation year (AY) 2016	Ongoing	November 10, 2016	Within 4 weeks of applying (pending sufficient DOE reserves of time)	through January 9, 2017
All continuing projects must be renewed for 2017. New projects may apply after the deadline.	August 9, 2016	September 19, 2016	December 9, 2016	January 10, 2017 - January 8, 2018

ERCAP AY 2017

Submitting the ERCAP renewal request:

http://www.nersc.gov/users/accounts/allocations/request-form/



What's New for AY 2017?

The currency at NERSC is the "NERSC Hour"

- **Equivalent to "MPP Hour" in previous years**
- **Change in nomenclature in preparation for Cori Phase II and follow-on systems**

- **Edison: 48 NERSC Hours per hour per node used**
- **Cori Phase 1: 80 NERSC Hours per hour per node used**
- **Cori Phase 2: TBD based on measure application performance**

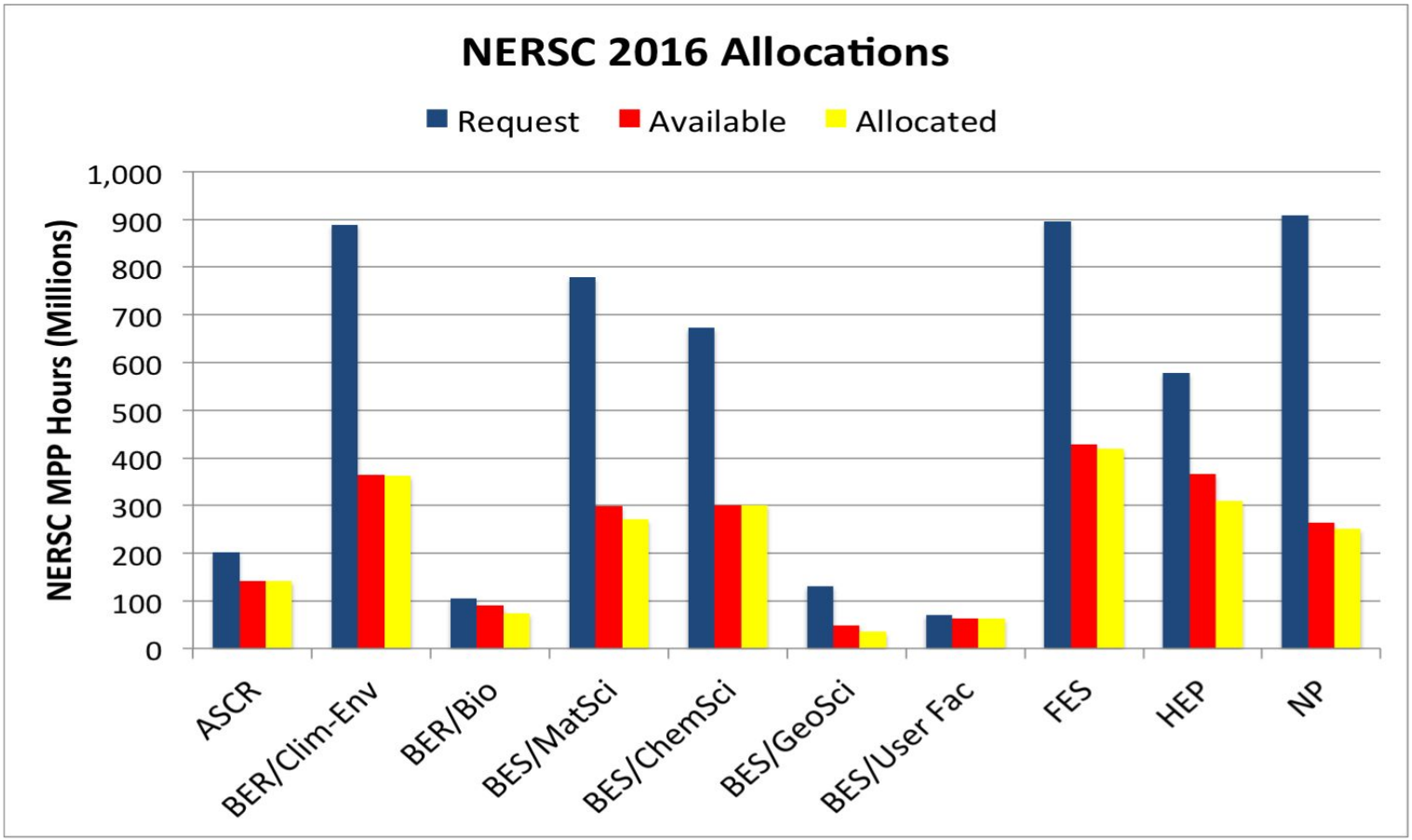
ERCAP AY 2017

Initial computing hours provided to DOE will initially be flat.

- **3 Billion NERSC hours to be distributed by DOE to the various offices.**
- **All Cori Phase 2 time will be allocated in the spring of 2017 for use in the second half of allocation year 2017.**

ERCAP AY 2017

AY 2016 Requested vs Allocated



ERCAP AY 2017

DOE Funding tab, Question # 10

If you have funding from sources other than the DOE Office of Science, we ask you to include information on all of your funding sources.

ERCAP AY 2017

Resources Requested, added question 18.1

- Use of Experimental or Observational data
- We are asking you to identify if the primary role of this project is to:
  - Analyze data from experiments or observational facilities?
  - Create tools or algorithms for analyzing experimental/observational data?
  - Combine models and simulations with experimental/observational data?

ERCAP AY 2017

Code Descriptions tab, question # 20

- **We reduced the amount of information requested**

Data & Analytics tab, questions 21 & 22

- **We removed this tab and the associated questions**

ERCAP AY 2017

Helpful URLs:

http://www.nersc.gov/users/accounts/allocations/deadlines

http://www.nersc.gov/users/accounts/allocations/overview/

http://www.nersc.gov/users/accounts/allocations/first-allocation

https://nim.nersc.gov

Contact Information:

Accounts & Allocations:

accounts@nersc.gov

allocations@nersc.gov

Phone:

510-486-8612 or

1-800-66-NERSC opt 2

Questions?

NERSC