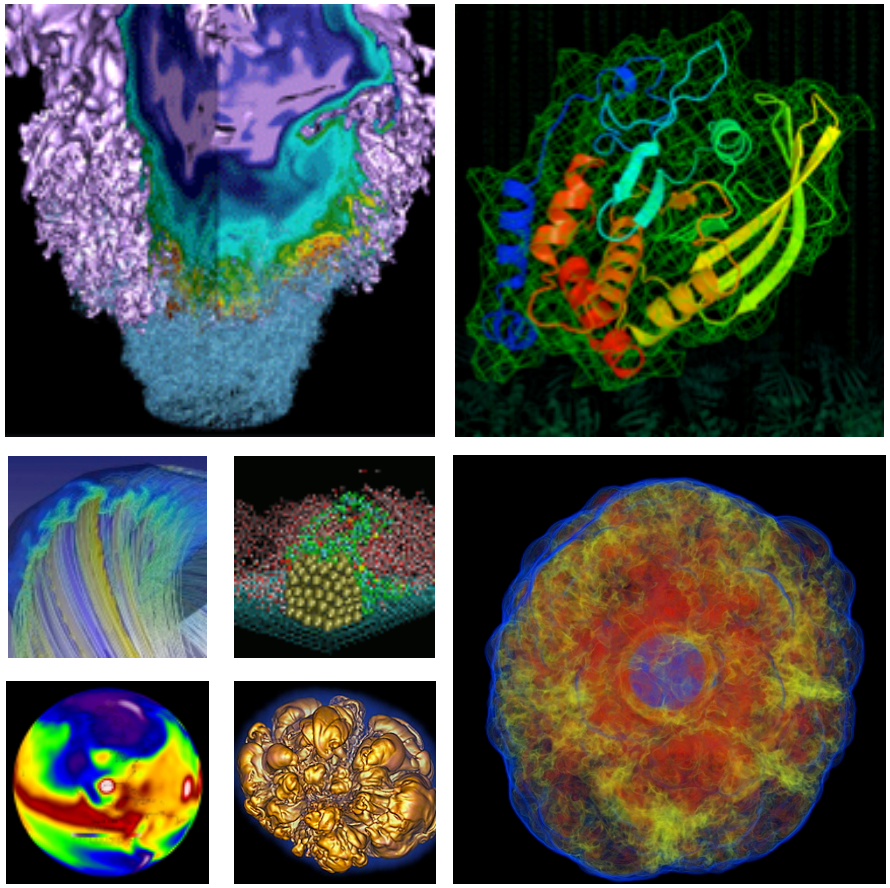
NERSC Overview



Richard Gerber

NERSC Senior Science Advisor
NERSC Training Lead

NERSC New User Training
September 10, 2013

The mission of the National Energy Research Scientific Computing Center (NERSC) is to accelerate scientific discovery at the DOE Office of Science through high performance computing and data analysis.

National Energy Research Scientific Computing Center (NERSC)

- **NERSC is a national supercomputer center funded by the U.S. Department of Energy Office of Science (SC)**
  - Supports SC research mission
  - Located at Berkeley Lab
- **SC supports a broad spectrum of energy-related research**
- **If you have SC funding, you can apply to use NERSC**
  - Other researchers can apply if research is in SC mission
- **4,500 users, 700 projects**
- **From 48 states; 65% from universities**
- **Hundreds of users each day**

NERSC's focus is on scientific productivity

13 Journal Covers in 2012

- 1,500 refereed publications per year
- ~10 major journal covers per year
- Key contributor to 2 Nobel Prizes (2007 & 2011)
  - Accelerating Universe
  - Climate Change
- Data services contributed to 2 of Science Magazine's Top 10 breakthroughs of 2012
  - Higgs Boson
  - Weak Mixing Angle

Current NERSC Systems

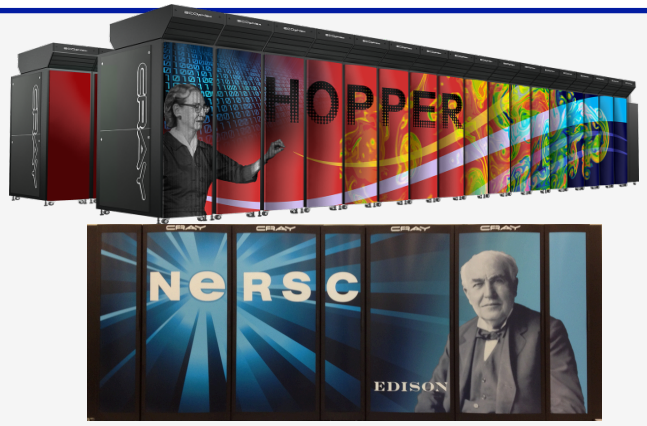
World-Class Supercomputers

Hopper: Cray XE6

- 6,384 compute nodes, 153,216 cores
- 144 Tflop/s on applications; 1.3 Pflop/s peak

Edison: Cray XC30 (Cascade)

- 5,200 node, 124,000 processors
- Over 250 Tflop/s on applications, >2 Pflop/s peak



Midrange

140 Tflops total

Carver

- IBM iDataplex cluster
- 9884 cores; 106TF

PDSF (HEP/NP)

- ~2K core cluster

GenePool (JGI Genomics)

- ~5K core cluster
- 2.1 PB Isilon File System

NERSC Global Filesystem (NGF)

Uses IBM's GPFS

- 8.5 PB capacity
- 15 GB/s of bandwidth

HPSS Archival Storage

- 240 PB capacity
- 5 Tape libraries
- 200 TB disk cache

Analytics & Testbeds

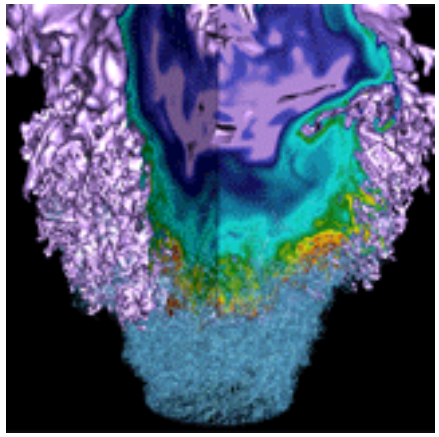
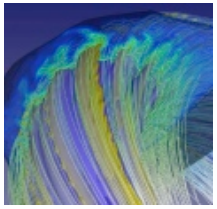
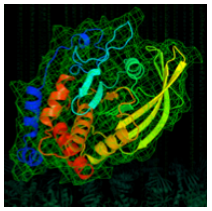
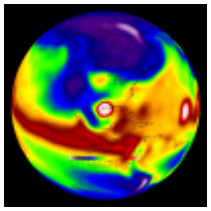
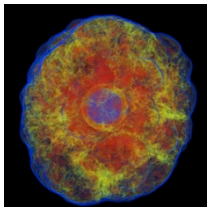
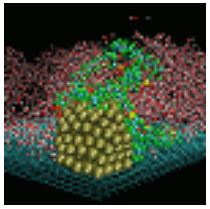
Dirac 48 Fermi GPU nodes

Consulting Services

- **NERSC's services are designed to help you maximize your productivity**
- **"Help Desk"**
  - Staffed by 10 HPC experts (6 with Ph.Ds)
  - 8-5 PT M-F
  - Direct phone and e-mail consulting
- **Account Support**
  - Allocations and account questions
  - Passwords
- **1-800-66-3772, consult@nersc.gov, accounts@nersc.gov**
- **https://help.nersc.gov/ online trouble ticket system**

Plan for Today

- **This is an introductory class for new NERSC users**
- **We plan to stay on time!**
- **Please hold lengthy questions for Q&A periods**
- **Schedule**
  - Accounts and Allocations
  - Connecting to NERSC
  - User Computing Environment
  - Submitting and Running Jobs
  - Data Management
  - NERSC Web and Next Steps

National Energy Research Scientific Computing Center

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