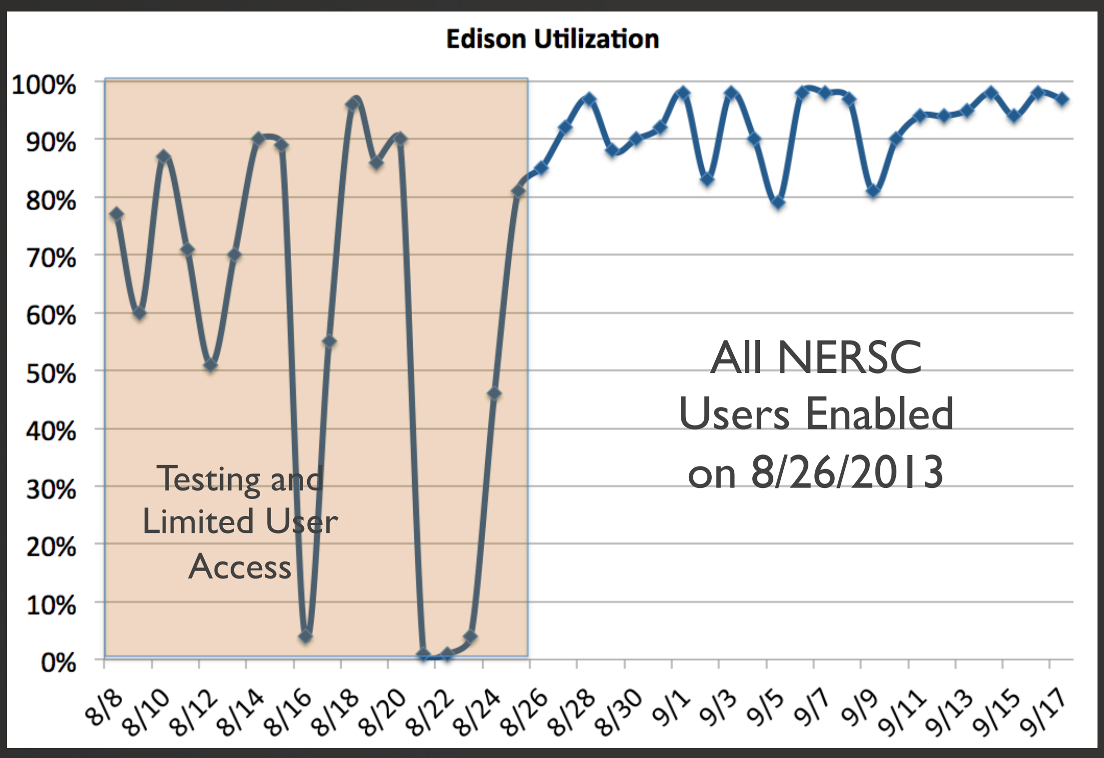

# NERSC's Edison Delivers High-Impact Science Results From Day One

NERSC's newest supercomputer, a Cray XC30 named "Edison," is providing a new level of computing power to DOE Office of Science researchers. From Day One scientists were able to take full advantage of Edison to start making big scientific advances.

NERSC's user were productive immediately due to Edison's stability and easy-to-use computing environment. In Edison's first 20 days, scientists used 61 million hours of computing time to conduct research in climate, environmental science, material science, chemistry, fusion energy, high energy physics, astrophysics, nuclear physics, and biosciences.



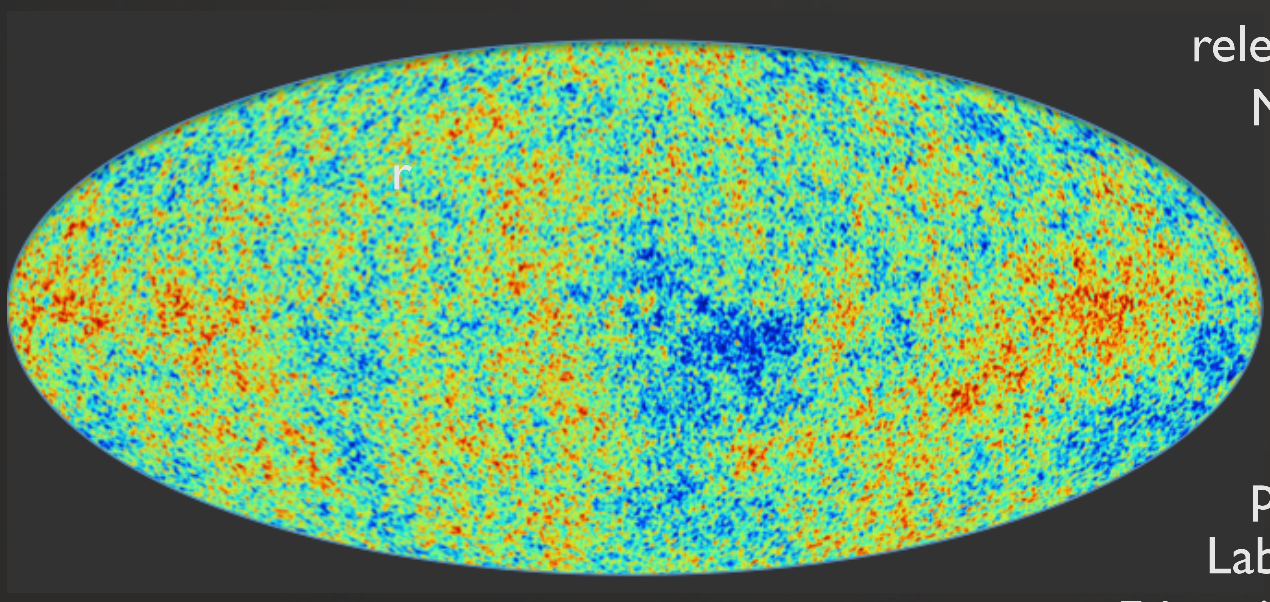

## Edison Facts

| First Petaflop system with Intel "Ivy Bridge" processors & Cray Aires High Speed Network | |
|---|---|
| Nodes | 5,200 dual-socket with 64 GB memory |
| Processors | Intel "Ivy Bridge" 12-core, 2.4 GHz |
| Network | Cray "Aires" Dragonfly Topology |
| Scratch Disk | 6.4 PB with >140 GB/sec bandwidth |
| Peak Performance | 2.4 PF/sec |
| Global Network Bandwidth (BW) | > 11 TB/sec |
| Node Memory BW | > 100 GB/s |

# Research Highlights

*Each year NERSC's 4,500 users publish about 1,500 refereed journal articles based on research performed using NERSC resources. Below are two early scientific results obtained by running on Edison during its first month.*

## Cosmic Fingerprints



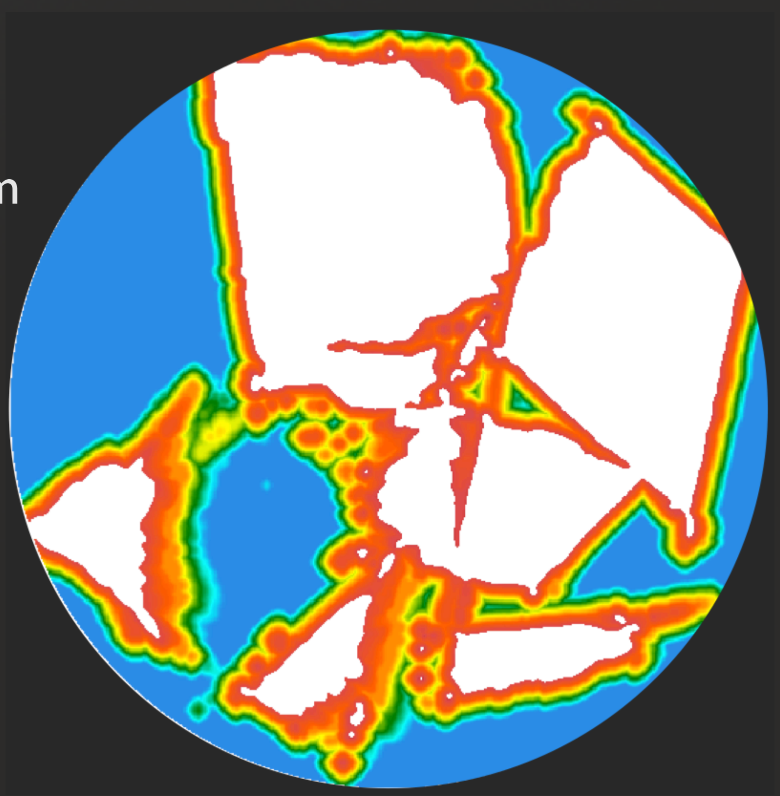
The Planck satellite made news in 2013 when its science team released the most detailed map ever made of of the Cosmic Microwave Background – the remnant radiation from the Big Bang – and refined some of the fundamental parameters of cosmology and physics.

More discoveries lie buried in the Planck data set, but massive computations are needed to separate the enigmatic polarization signal from background noise. A team lead by Berkeley Lab's Julian Borrill is harnessing Edison's computational power to produce the tens of thousands synthetic Planck observations that this requires.

## Carbon Sequestration

What if you could capture and store ($CO_2$) in subsurface rock? A research team headed by Berkeley Lab's David Trebotich used Edison to perform the world's most detailed pore-level simulation of how $CO_2$ migrates through rock formations, undergoing complex chemical reactions along the way.

The image to the right reveals the intricate interplay between bulk fluid (colored) and mineral grains (white) and, in a crucial advance, validates the computational results against laboratory experiments.



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BERKELEY LAB Lawrence Berkeley National Laboratory

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