

# Supercomputing at a Non-PhD Granting Institution



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# Outline

- The Will
- The Way
- The Vision
- HiPACE in Action
- HiPACE Inaction

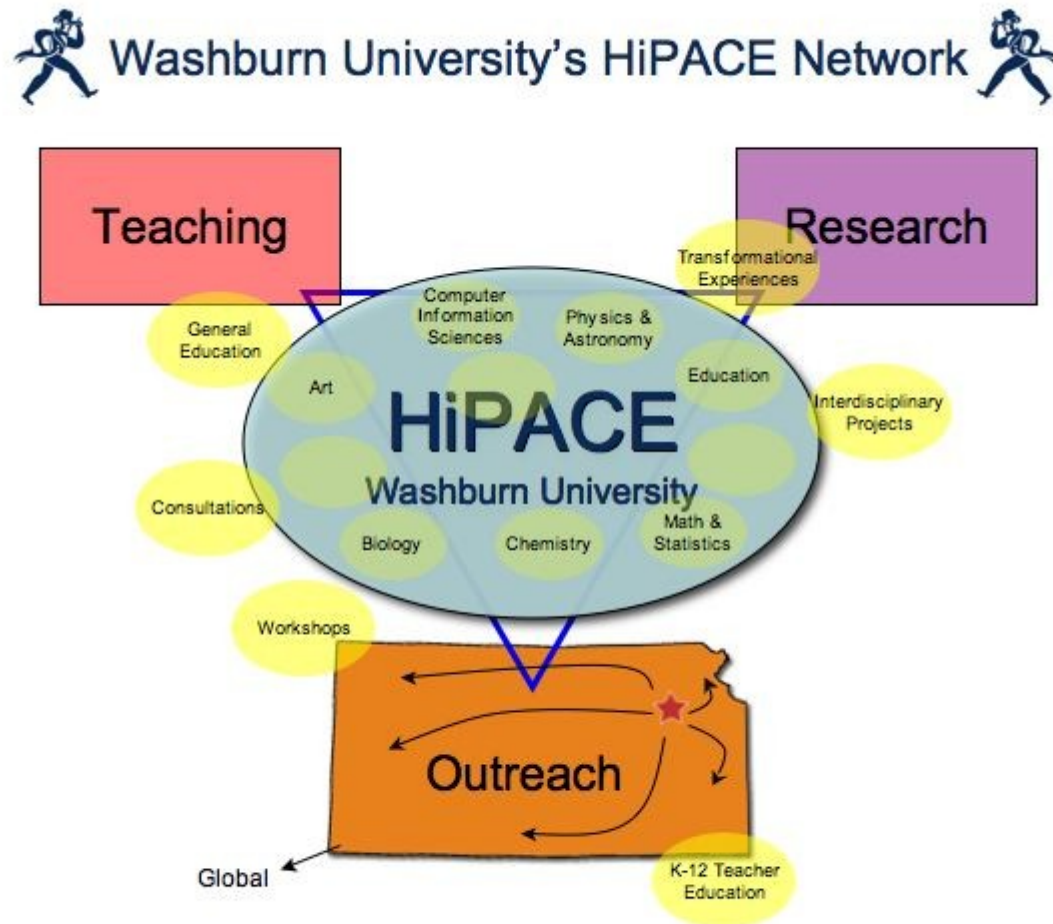
# The Will: Background and Motivation

- Academic computing merged with administrative computing in 2000
- Increased interest in incorporating computational science in the classroom
- Increased interest in computational science research
- Washburn Transformational Experience

# The Way: The Washburn Innovation Grant

- Created by Washburn University Board of Regents
- Funded by the Washburn Endowment Association
- Supports projects that will make a significant impact on the future of Washburn University
- Provides \$300,000 over three years

# The Vision: A High Performance Academic Computing Environment (HiPACE)



# The HiPACE Proposal

*We proposed to...*

- Create an independent academic computing environment
- Enhance technology in the classroom
- Provide a platform for student and faculty research
- Provide a platform for interdisciplinary and collaborative projects
- Offer outreach programs for K-12 educators

# HiPACE Hardware

## *Computing Cluster:*

34 compute nodes

2 dual-core Opteron processors/node

4 GB RAM/node

## *File Server:*

12 TB

## *SMP System:*

8 dual-core Opteron processors

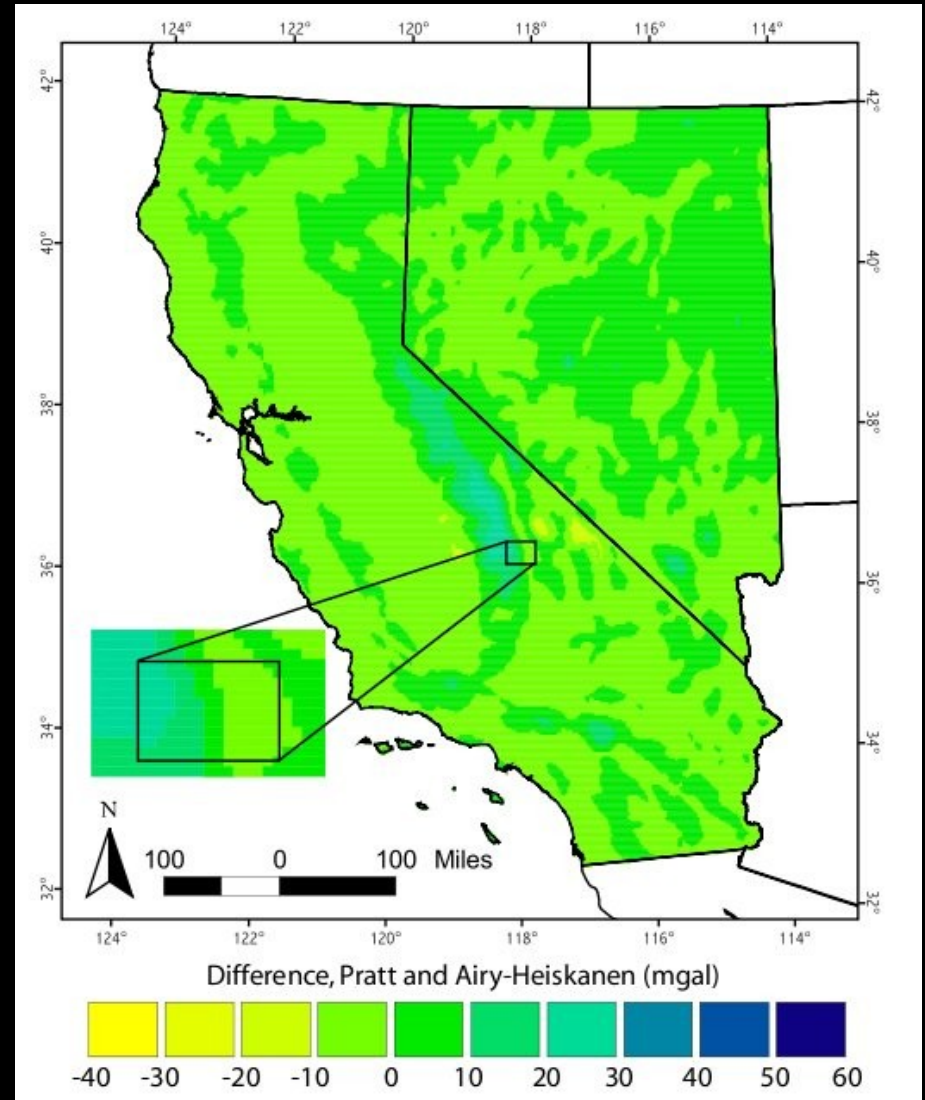
64 GB RAM

*All from Aspen Systems, Inc.*

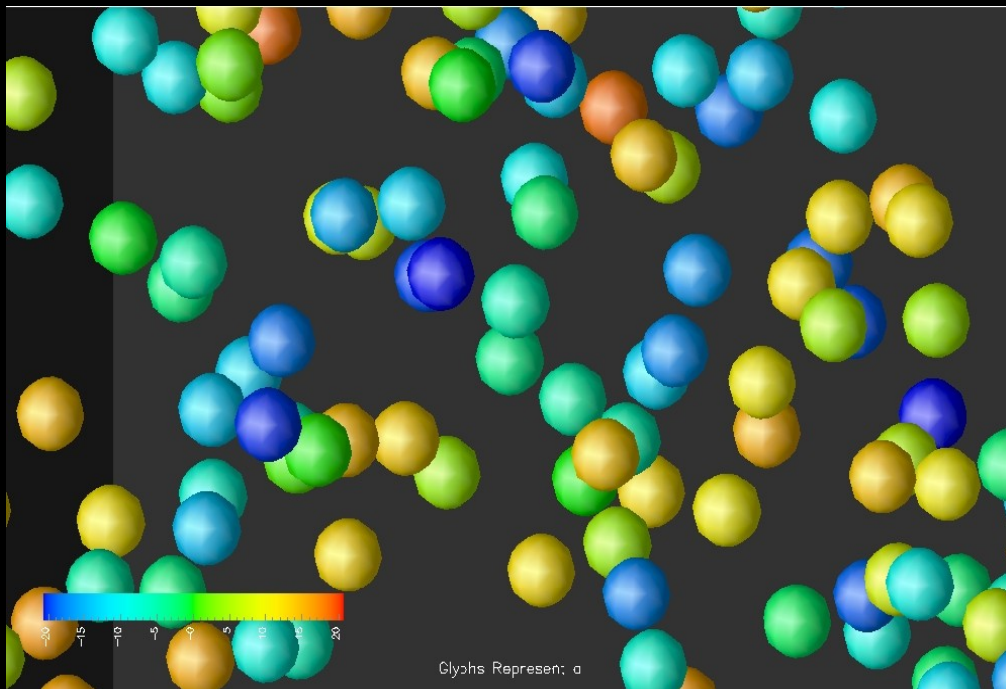


# HiPACE in Action: Geophysics

The SMP system is being used to compare isostatic gravity correction models (Linda Garinger)



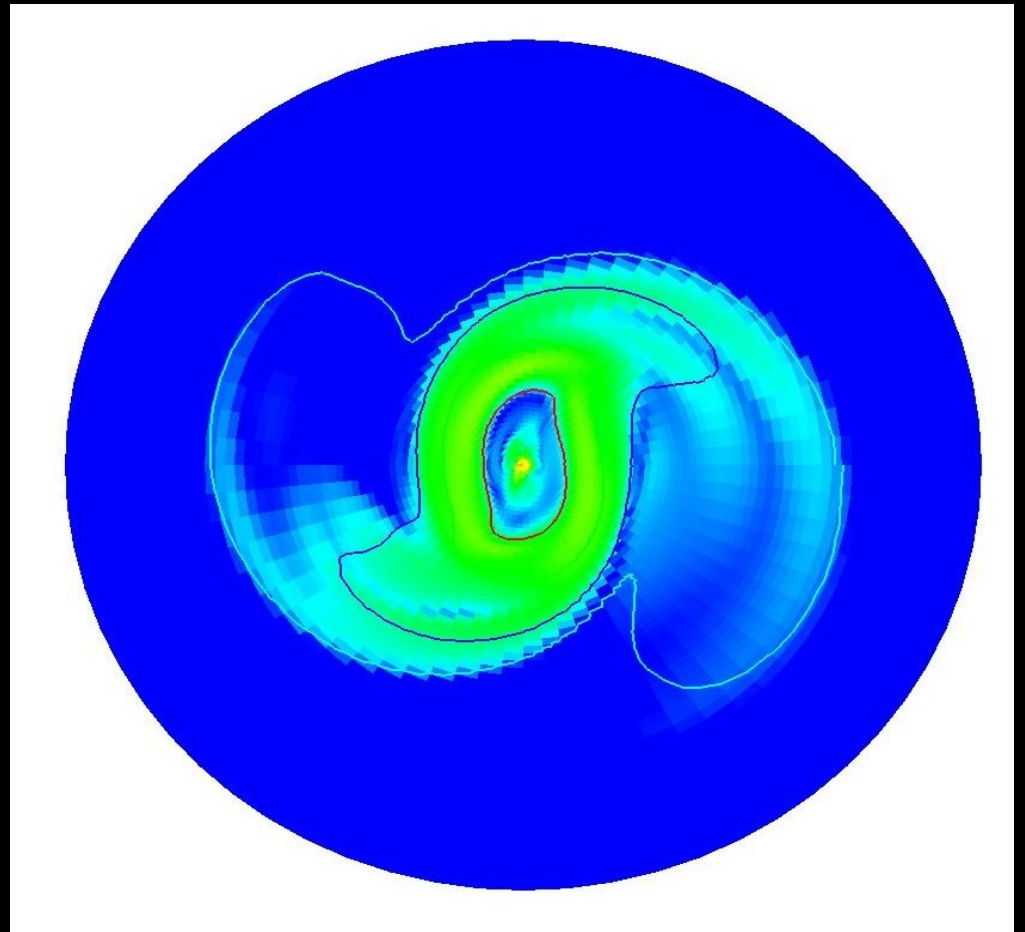
# HiPACE in Action: Molecular Dynamics



The SMP system is being used to model atoms in a 4D Lennard-Jones potential (Steve Black)

# HiPACE in Action: Astrophysics

The compute cluster is being used to model unstable rotating neutron stars (Karen Camarda)



# HiPACE in the Classroom

“Cluster Computing” course offered Spring 2007

Students wrote programs that were used to test cluster system

# HiPACE-inspired activities

HiPACE-funded attendance at computational workshops

Natural Science Division meeting talks

Computational science honors seminar

Computational Physics Program

# HiPACE Inaction: CALEA

The Communications Assistance for Law Enforcement Act (CALEA) was signed into law in 1994.

CALEA requires that “telecommunications carriers” ensure that their networks are technologically capable of being accessed by authorized law enforcement officials.

Networks whose sole purpose is to provide telecommunications are covered by CALEA.

Networks internal to an institution that only provide information to the outside world are not covered by CALEA.

If outside users allowed to access internal networks, network is considered hybrid and subject to CALEA.

# HiPACE Inaction: CALEA

Educational institutions may be hybrid networks.

Must “know” who is on your network to comply with CALEA.

One possible interpretation: institution's CIO must have administrative control of any machine accessible to the outside world.

# Acknowledgments

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HiPACE Steering Committee:

Stephen Angel

Steven Black

Donna LaLonde

Bruce Mechtly

John Mullican

Gary Schmidt