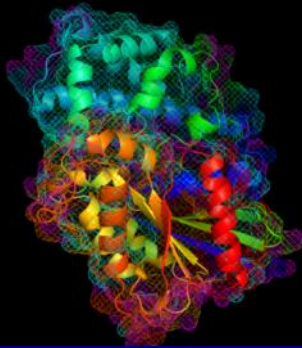




**NEXT UP**



# What is so special about *TACC*?

Melyssa Fratkin  
External Relations Manager  
June 4, 2010

# Mission

*TACC's mission is to **enable discoveries that advance science and society** through the application of advanced computing technologies.*

*UT Austin: What starts here, changes the world*

*TACC: Powering discoveries that change the world*

# Ranger



# Ranger

- “Ranger” is one of the most powerful supercomputers in academia, with over 579 teraflops peak performance.
- To build and deploy Ranger, the National Science Foundation awarded TACC \$59 million, the largest award ever from that agency to UT Austin.
- TACC, ICES, Cornell are providing operations/support system for 4 years
- Two year statistics:
  - 97% uptime
  - 1,089,075 jobs run
  - 755 million hours compute time used

# What's a Teraflop?

One FLOP (floating point operation per second) is “ $1+1=$  \_\_\_\_\_”

A teraflop is a TRILLION  
(1,000,000,000,000) operations per second.

Ranger runs at 579.4 Teraflops



bright-eyed and bushy-tailed  
**The Statesman Dog Show**

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## UT researchers use advanced computer to map Haiti earthquake damage



Christina Murray/UNIVERSITY OF TEXAS

Gordon Wells led University of Texas-based data-collection project to assess and map damage to Haiti after the Jan. 12 earthquake.

By **Kirk Ladendorf**  
AMERICAN-STATESMAN STAFF

Updated: 10:13 a.m. Tuesday, Feb. 2, 2010  
Published: 10:50 p.m. Monday, Feb. 1, 2010

Post a Comment | E-mail | Print | Share | Larger Type

Within hours of Haiti's disastrous Jan. 12 earthquake, a group of researchers at the University of Texas employed cutting-edge computer technology, an informal network of geology experts and satellite imagery to start the work of creating accurate damage assessment maps of the Caribbean nation.

Scientists at the Center for Space Research at UT compiled and corrected some of the first damage assessment maps within two days after the quake and made them available to those in charge of planning the response to the disaster.

For Gordon Wells, the program manager in charge of the impromptu Haiti project, the work was similar to other computerized damage forecasts and assessments the center had done following earlier disasters, including Hurricane Katrina in 2005 and Hurricane Ike in 2008.

### RELATED

► Interactive: Inside Ranger,

Site  Web  Archive Web Search by **YAHOO!**



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### LATEST BUSINESS GALLERIES »



What's selling in Hutto, 01.31.10



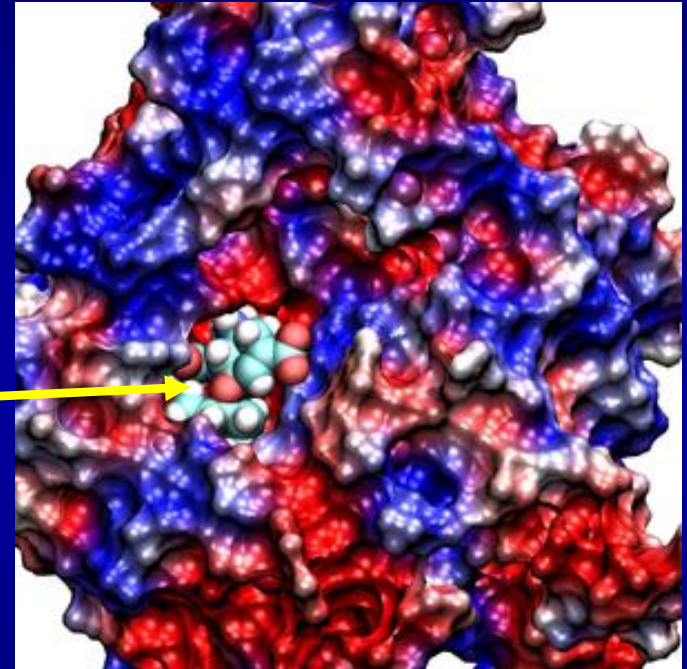
What you get for \$275,000 to \$350,000 in Ceda



Hot properties, 01.31.10

# Studying H1N1 (“Swine Flu”)

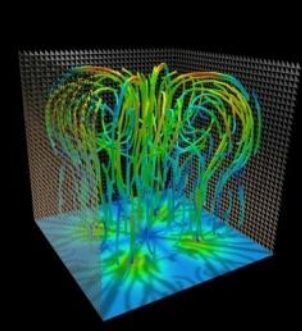
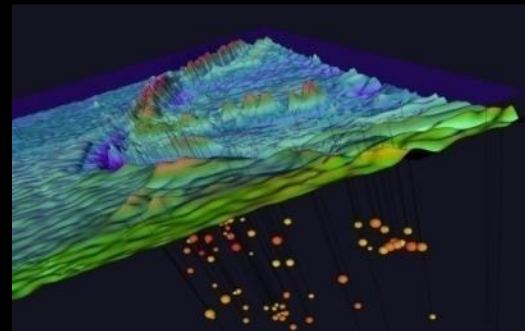
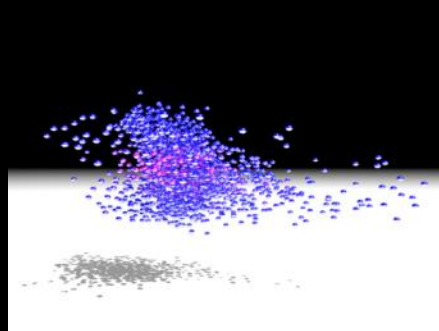
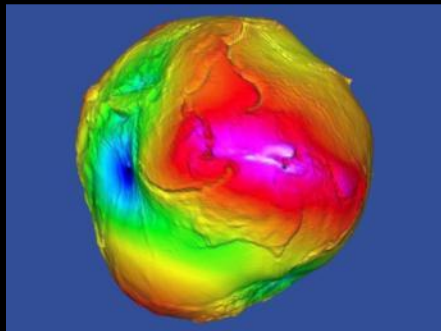
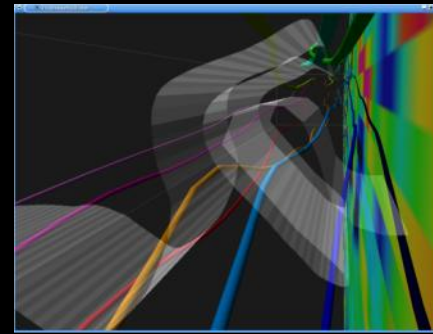
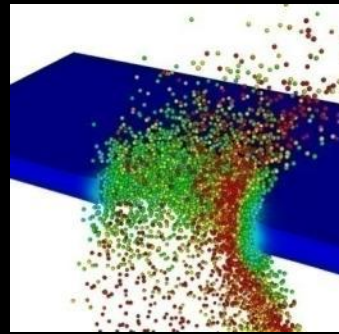
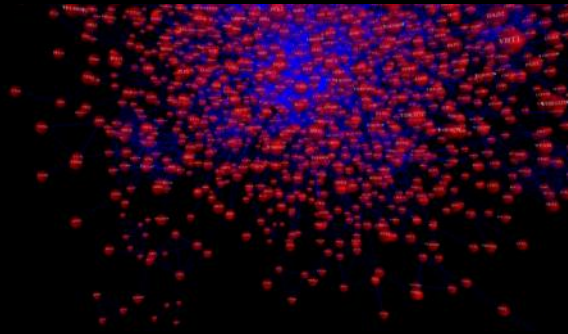
- Researchers at the University of Illinois and the University of Utah used *Ranger* to simulate the molecular dynamics of antiviral drugs interacting with different kinds of flu.
- They discovered how commercial medications reach the “binding pocket” – and why Tamiflu wasn’t working on the new swine flu strain.
- UT researcher Lauren Meyers used *Lonestar* to predict the best course of action in the event of an outbreak.



# BP Oil Spill Research

- Dr. Clint Dawson et al are researching the impact of the oil spill on wetlands and marshes in Gulf Coast states
- Satellite data from UT Center for Space Research every six hours
- 72-hour forecast at 50 meter resolution, 10 to 20 times more detailed than previous models
- 1M hours compute time allocated on Ranger (already used half!)

# TACC provides general visualization resources and services to a national user community

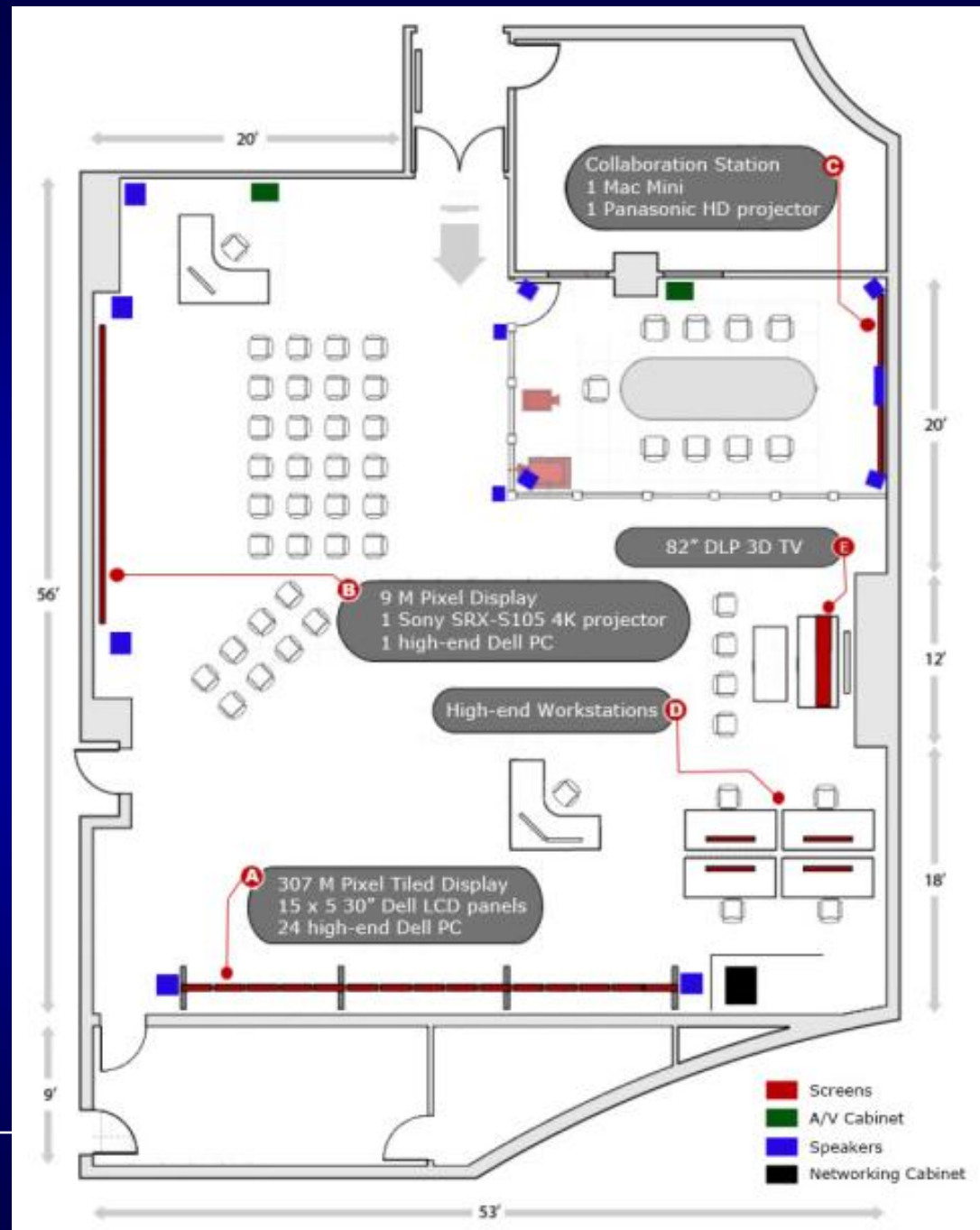


**"The most exciting phrase to hear  
in science, the one that heralds  
new discoveries, is not  
'Eureka!' (I found it!)  
but '*That's funny...*' "**

**-- Isaac Asimov**

# ACES Visualization Lab

- 2900 sq. ft.
- “Stallion”: 15x5 30-inch Dell monitors – 307M pixels
- “Saddle” Collaboration Room
- “Bronco” - 4xHD projector and screen
- “Mustang” 3D system
- High-end workstations





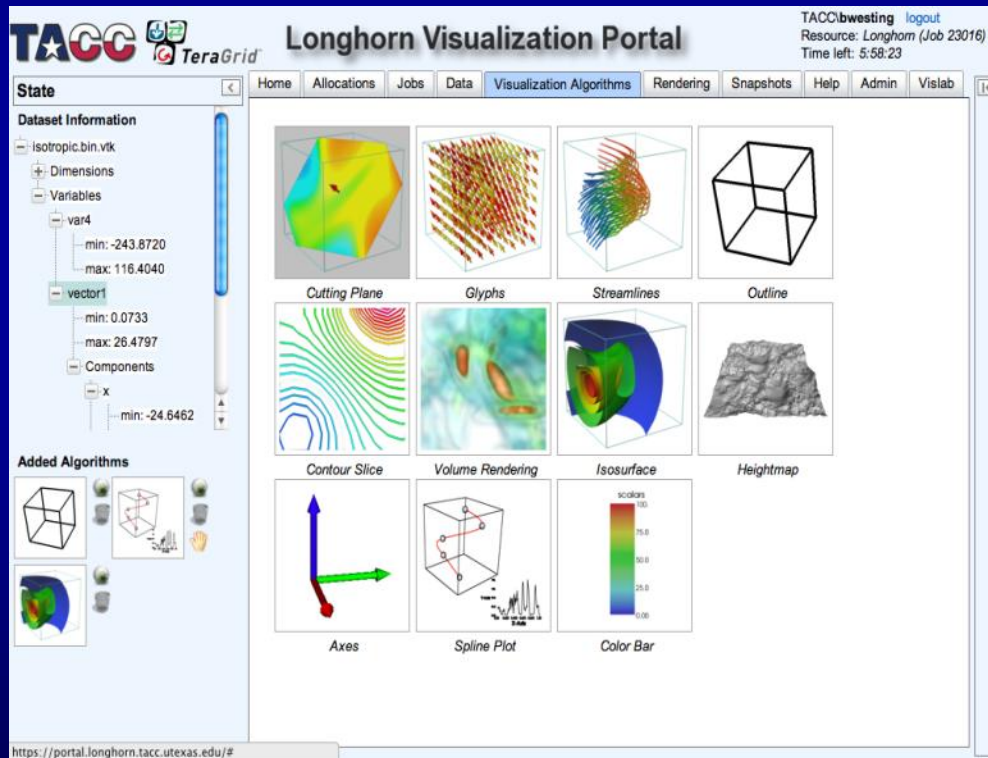
*Unprecedented scale and resolution!*



# Visualization Portal

Remote interactive visualization tool, developed at TACC

- Dramatically simplifies the visualization process
- Semi-automated data importation



- Powerful, easy-to-use entry point for researchers
- Quick and easy interactive visualization
- Web-based – works from anywhere!

# Data Mining & Analysis on Corral

- University of Alaska Museum of the North: Herbarium Digitization
- University of Alaska Fairbanks - Killer Whale Acoustics Data
- UC Berkeley Museum of Vertebrate Zoology Ornithology Collection
- The University of Texas at Austin
  - Center for Space Research
  - The Gravity Recovery and Climate Experiment (GRACE)
  - Institute for Classical Archaeology
  - PECOS Engineering Simulation Project
  - Cyberinfrastructure for Emergency Situation Assessment and Response (CESAR)



# Sample Data on Corral

## Blue Heron eggs

Dept. No. 102

Accession No. 77

UNIVERSITY OF CALIFORNIA  
MUSEUM OF VERTEBRATE ZOOLOGY  
DEPARTMENT CATALOGUE, BIRDS' EGGS AND NESTS

Eggs are Marked 194 <sup>1021</sup>/<sub>3</sub>

Nest is ~~marked~~ <sup>not saved</sup>

Name { Scientific Ardea herodias treganzai  
Common Pallid Blue Heron

Locality Salton Sea, Calif.

Date Apr. 18-09 Incubation just begun No. Eggs in Set 3

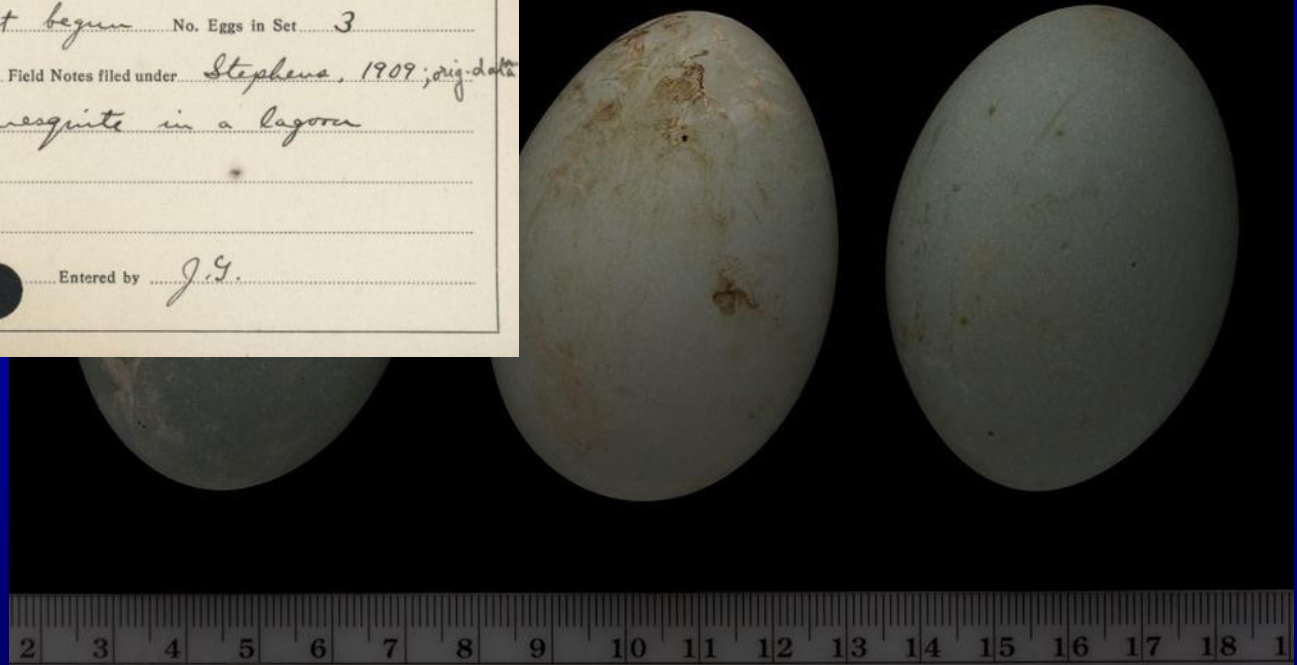
Collector F. Stephens Field Notes filed under Stephens, 1909; orig. data

Nest 9 feet up in dead mesquite in a lagoon

Condition good. Entered by J.G.

NAME Ardea herodias treganzai DEPT. NO. 102

LOCALITY Salton Sea, Calif. COLLECTOR F. Stephens



# Education & Outreach

- Scientific Computing Curriculum @ UT
  - Intro to Programming in Fortran/C
  - Intro to Scientific/Technical Computing
  - Parallel Computing for Science & Engineering
  - Visualization & Data Analysis for Science & Engineering
  - Cloud Computing for Science & Engineering
- Community Outreach
  - The Austin Forum
  - Project IT Girl
  - Explore UT
  - TACC Tours & Demos



# Outreach – New Communities

- “Exploring Creativity in Digital Space”
  - Invited photographers and digital media artists to create works to display in Vislab
  - Over 200 attended
  - Future shows will be co-sponsored by the Blanton Museum of Art and the Austin Museum of Digital Art (AMODA)



# Training

- Free to all university faculty, students, researchers, industrial affiliates, etc.
- At least two training courses per month
- Range of courses, including
  - Fortran 90/95 and C
  - Parallel computing
  - Scientific Visualization
  - Code Optimization
  - Intro to HPC for Computational Biology

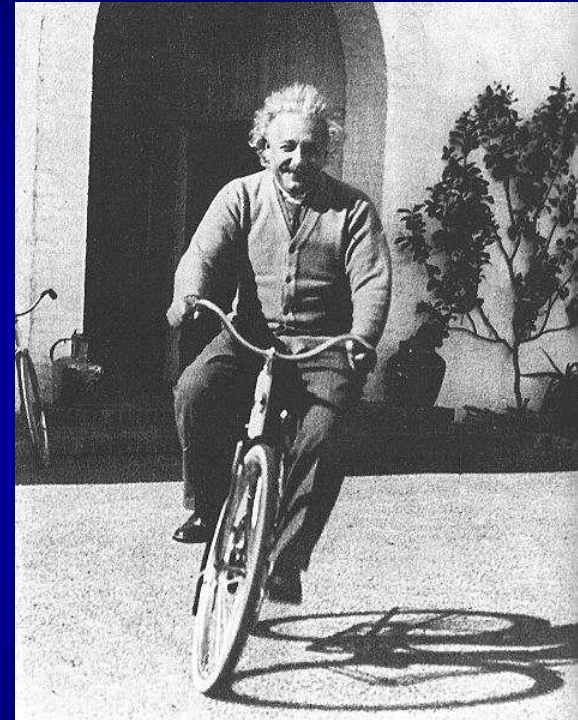
# TACC in the TeraGrid



As part of the TeraGrid, the National Science Foundation's national cyberinfrastructure for open academic research, TACC is one of eleven partners providing resources to leading scientific researchers across the United States.

# Humans and Computing

**Computers** are incredibly fast, accurate, and **stupid**;  
**Humans** are incredibly slow, inaccurate and **brilliant**;  
**Together** they are powerful beyond imagination.



*-- Albert Einstein*

A person's hands are holding a rectangular sign with a yellow background and a red border. The sign is held against a dark blue background. The text on the sign is in a bold, red, serif font. The word 'APPLAUSE' is on the top line, and the word 'PLEASE' is on the bottom line. The sign is held by two hands, one at the top and one at the bottom.

**APPLAUSE**

**PLEASE**