Monterey Bay Ocean Flow Visualization
Regional Ocean Modeling System (ROMS)
scientific simulation: Yi Chao, JPL/Caltech

Monterey Bay Ocean Flow Visualization
Harvard Ocean Prediction System (HOPS)
scientific simulation: Allan Robinson, Pierre Lermusiaux, Wayne Leslie, Harvard University

Visualization of an F3 Tornado
Storm Chaser Perspective
scientific simulation: Robert Wilhelmson, Matthew Gilmore, University of Illinois; Lou Wicker, NSSL/NOAA

Nonlinear Evolution of the Universe:
from 20 million to 14 billion years old
scientific simulation: Renyue Cen, Jerimiah P. Ostriker, Princeton University

Population III Star Formation And Supernova
scientific simulation: Michael Norman, UCSD; Brian O’Shea, LANL

Formation of the Milky Way Galaxy
from 16 million to 13.7 billion years old
scientific simulation: Brian O’Shea, LANL; Michael Norman, UCSD

A Quasar-driven Outflow:
The Explosive Ramifications of a Galaxy Merger
scientific simulation: Brant Robertson, U of Chicago; Lars Hernquist, T.J. Cox, Harvard University; Volker Springel, Max-Plank; Tiziana Di Matteo, CMU

Jet Production From a Rotating Black Hole
scientific simulation: John F. Hawley, U of Virginia; Julian H. Krolik, Johns Hopkins University

Flight to the Center of the Milky Way
science advisors: Mark Morris, UCLA; Doug Roberts, Northwestern/Adler Planetarium

Visualizations created by NCSA's Advanced Visualization Laboratory
Donna Cox, Robert Patterson, Stuart Levy, Matthew Hall, Alex Betts, Lorne Leonard

National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign
NCSA’S ADVANCED VISUALIZATION LABORATORY

The Advanced Visualization Laboratory (AVL) at NCSA works with scientists to develop and use cyberinfrastructure to create high-end, high-fidelity, and high-resolution data-driven scientific visualizations. These visualizations are technically developed and aesthetically designed to support scientific narratives for outreach purposes, as an important goal is to communicate, inspire, and reach out to large, non-expert audiences.

Renowned experts on computer visualization, NCSA’s AVL team have thrilled millions of people with visualizations for the Oscar-nominated IMAX film “Cosmic Voyage,” the PBS NOVA episodes “Hunt for the Supertwister,” “Runaway Universe,” and “The Monster of the Milky Way,” as well as Discovery Channel documentaries and pieces for CNN and NBC Nightly News. The team worked with New York’s American Museum of Natural History to produce high-resolution visualizations for shows at the museum’s Hayden Planetarium—“The Search for Life: Are We Alone?” and “Passport to the Universe.” The Denver Museum of Nature and Science debuted “Black Holes: The Other Side of Infinity” in February 2006; that show is also running at the Adler Planetarium in Chicago.

In creating these scientific productions, the AVL team develops new cyber-technologies and advanced visualization tools and software pipelines. Each of the team members play unique roles and contribute a variety of skills to the process and productions; expertise includes advanced graphics and visualization software development, visual design, camera choreography, multimedia production, data management, and render wrangling. NCSA Visualization Director Donna Cox is among a select group of visionaries from diverse disciplines whose work was recently spotlighted in a major exhibition at Chicago’s Museum of Science and Industry. “Leonardo da Vinci: Man, Inventor, Genius” included a video sampler of work produced by Cox and the AVL team.

NCSA’s AVL team recently developed Amore, a software capable of rendering adaptive mesh refinement data. Prior to Amore, rendering AMR data was very challenging owing to the number of individual elements. The AVL team also has developed software such as Virtual Director™, a patented virtual reality interface that enables gestural motion capture and voice control of navigation, editing, and recording.

To learn more about NCSA and the Advanced Visualization Laboratory, log on to www.ncsa.uiuc.edu/AboutUs/Directorates