

# WORLD-LEADING COMPUTING FACILITIES

*Computational Science Fuels Discovery*

Earth's average monthly water-vapor distribution according to an OLCF simulation. Credit: Oak Ridge National Laboratory.

## INNOVATIONS

### A WORLD-CLASS ENSEMBLE OF ADVANCED MACHINERY AND EXPERTISE

ASCR's HPC facilities provide unique resources and support for cutting-edge research—at government labs, universities and in industry—that couldn't be done any other way.

- The leadership computing facilities at Argonne and Oak Ridge national laboratories (ALCF and OLCF) provide the world's most powerful supercomputers to researchers on a competitive basis for addressing grand challenges in science, health and technology.
- Located at Lawrence Berkeley National Laboratory, the National Energy Research Scientific Computing Center (NERSC) provides world-class resources to support the mission priorities of the six DOE Office of Science program offices.
- ALCF, OLCF and NERSC support users with scalable workflows and software for data-intensive computing. All three facilities are evaluating and implementing machine learning and artificial intelligence as powerful computational tools for future discoveries.

## IMPACT

### FACILITIES DRIVE SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT

Virtually every discipline in science and engineering has benefited from DOE's sustained investment in computing.

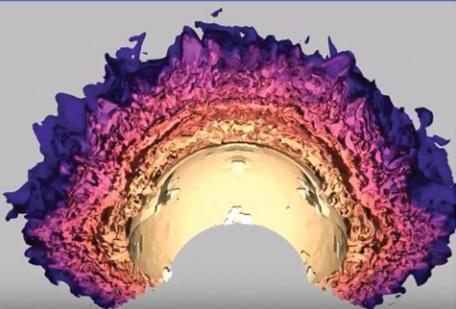
- DOE's HPC national user facilities have hosted thousands of researchers from all 50 states and many countries and provide a training ground for tomorrow's computational science workforce.
- By leveraging these facilities, U.S. scientists lead computational science research, producing thousands of high-impact research publications each year.
- Groundbreaking computing and data systems installed at ASCR's HPC facilities drive technological innovation in industry, paving the way for tomorrow's computers and assuring U.S. leadership in the field.

## TAKEAWAY

### HPC FACILITIES HAVE LEFT AN INDELIBLE MARK ON SCIENCE

DOE's supercomputing facilities are a unique national resource in support of scientific discovery.

**S**olving the world's most challenging scientific and societal problems requires the world's most powerful supercomputers and data analysis facilities. The Department of Energy's (DOE's) Advanced Scientific Computing Research (ASCR) program anticipated this need decades ago and devised a first-of-its-kind nationwide infrastructure of supercomputing centers connecting DOE scientists and thousands of university and industry researchers via the world's fastest and most advanced scientific network. Scientists from across the U.S. and the world use these facilities, located at Argonne, Lawrence Berkeley and Oak Ridge national laboratories, to tackle the world's toughest scientific and technical challenges.



Extreme turbulence from a hydrodynamic simulation of a massive star. Credit: University of California, Santa Barbara and Joseph A. Insley/ALCF.