

Building 654

NEW MODULAR FACILITY MEETS GROWING NEED FOR HIGH PERFORMANCE COMPUTING

B654—NOW OPEN AND HOUSING THE NEXT GENERATION OF SYSTEMS

Sited at Lawrence Livermore National Laboratory (LLNL), a new, dual-level modular facility—Building 654—was dedicated in June 2016, and now houses new platforms that will provide LLNL researchers and their collaborators greater access to the high performance computing (HPC) capabilities they need to perform their national security work. The approximately \$10M-building consists of a 6,000-square foot machine floor flanked by support space. The main computer structure is flexible in design to allow for possible expansion and to accommodate future computer technology advances in HPC. In fiscal year 2018, LLNL intends to add a powerful but smaller companion platform modeled off of the “Sierra” advanced technology system.

B654 provides unclassified HPC system space suitable for supporting the National Nuclear Security Administration’s (NNSA’s) Advanced Simulation and Computing (ASC) Program, other related national security missions, and collaborations with academia.

ASC is the simulation effort for NNSA’s stockpile stewardship program to ensure the safety, security and effectiveness of the nation’s nuclear deterrent without additional underground testing.

B654 enables liquid cooling solutions and provides cabling, electrical, plumbing, and fire protection and detection. The building can provide up to 7.5 megawatts of electric power and was designed so that additional power and mechanical resources can be added as HPC technologies

evolve. The heating, ventilation, and air conditioning systems meet sustainable design requirements to promote energy conservation. The ceiling height assures proper forced air circulation and allows for the installation of utilities and HPC systems.

“Unclassified high performance computing is critical to the stockpile stewardship program’s success and the need for this capability will continue to grow,” said Laboratory Director Bill Goldstein. “Modernizing the Lab’s computing infrastructure enables us to better exploit next-generation supercomputers for NNSA by tapping the talents of top academic and private sector partners.”



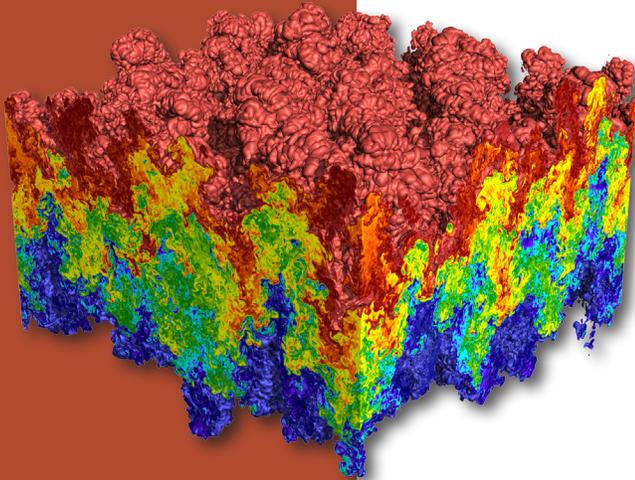
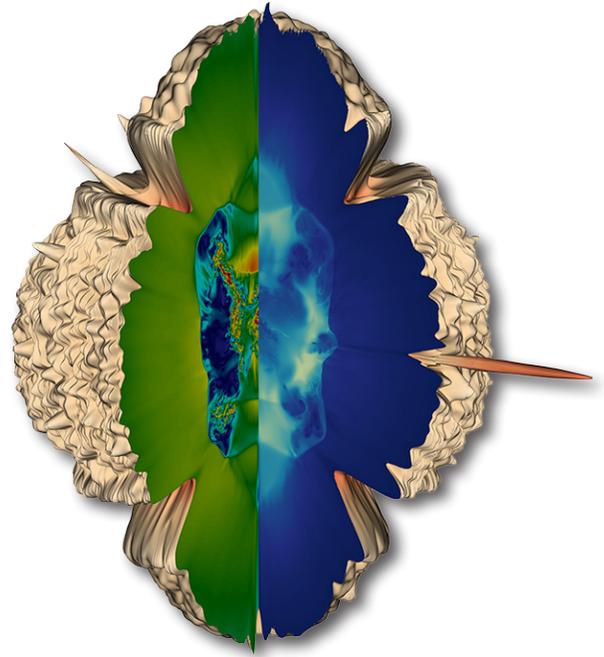
NEW INFRASTRUCTURE SUPPORTS BOTH NATIONAL SECURITY MISSION AND SCIENTIFIC AND TECHNICAL APPLICATIONS

High performance computing at LLNL is central to its mission success.

Supercomputers and facilities support the spectrum of national nuclear security enterprises, including assuring the safety, security, and effectiveness of the nation's nuclear stockpile; investigating weapons' science, performing modeling experiments, addressing non-proliferation and nuclear counterterrorism, and understanding hydrodynamics. Codes and computers developed by the weapons laboratories have been applied to other

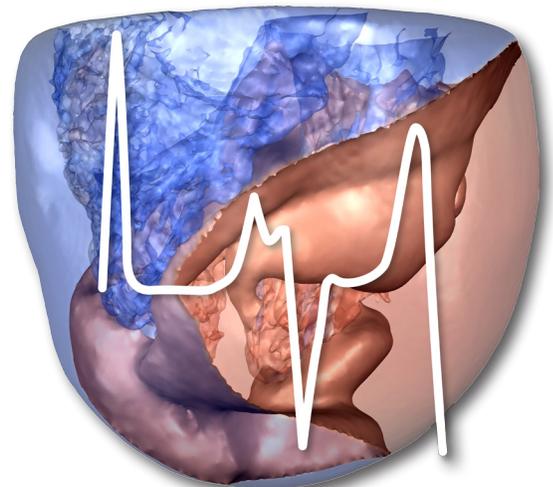
areas of national security, including projects for the Department of Energy, Department of Defense, and Homeland Security. Finally, HPC at LLNL spans a myriad of scientific and technical applications, including human health, energy and climate, and industry.

The prediction, with confidence, of the behavior of *any* complex system, be it the human heart, the climate, or a combustion engine, benefits from exascale and super-exascale capabilities. Adding B654 to the Livermore Computing Complex is one of the many steps being taken by LLNL to deliver on its national security mission and supporting scientific research.



Simulations:

Top right: Inertial Confinement Fusion capsule at peak compression. Center: Rayleigh-Taylor instability growth. Bottom right: Simulation of electrical propagation in the human heart.



FOR MORE INFORMATION

See the ASC at Livermore
Web site:
<https://asc.llnl.gov/>