Great Tools

Turning scientific concepts into reality takes great engineers, innovative ideas, cutting-edge technologies, and world-class facilities. You'll find all these at Lawrence Livermore National Laboratory, where engineers both use and help develop a wide array of state-of-the-art computational modeling, precision machining, characterization, microscale engineering, and other tools. Additionally, you'll have access to some of the most advanced research and development facilities in the world.

Materials Characterization

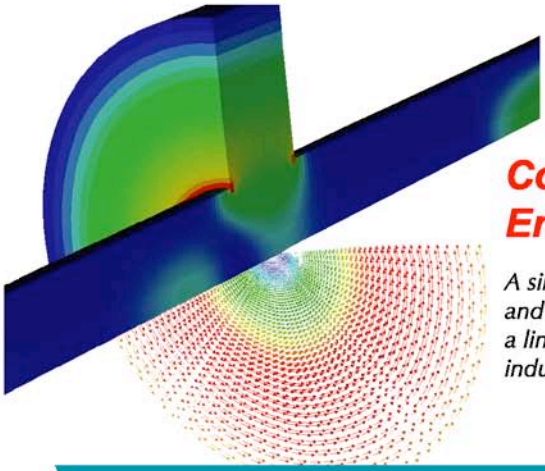
The PCAT Computed Tomography and Digital Radiography System. We have extensive capabilities in x-ray nondestructive characterization methods including x-ray machines that range in energy from just a few kilovolts (kV) to nearly 10 megavolts (MV). Lower energies are used for inspecting physically small and/or low-density objects such as beads, foams, polymers, and light metal. Higher energies are used for inspecting large and/or high-density objects such as assemblies and high-density metals.

Microscale Engineering

Our microtechnology building houses 3500 square feet of Class 10–1000 clean rooms for micromachining, silicon microelectronics, III–V semiconductor optoelectronics, and guided-wave photonics. Other labs provide material characterization and device-testing capabilities, microscopic inspection, packaging, and electrical and optical testing of devices.

Precision Machining

The Large Optics Diamond Turning Machine (LODTM) can produce parts with a contour accuracy of 25 nanometers and surface finishes in the range of 50–100 angstroms. LODTM is currently the most accurate large machine tool in the world, but our engineers are at work on an even more accurate successor.



Computational Engineering

A simulation of the electric and magnetic fields inside a linear accelerator induction cell.

Shown at left: LLNL's Terascale Simulation Facility (TSF) accommodates the simultaneous operations of two Advanced Simulation and Computing (ASC) supercomputers: BlueGene/L and ASC Purple. Between the two, TSF computers provide nearly one-half petaops of computing power available for scientific and engineering simulations.