



OFFICE OF COMMUNICATIONS

PRESS RELEASE – AUGUST 16, 2010, 5:00 PM PST

Contact: Melinda Lee, Media Manager, melinda.lee@slac.stanford.edu, (650) 926-8547

Energy Secretary Dedicates World's Most Powerful X-ray Laser

Menlo Park, Calif. — Secretary of Energy Steven Chu on Monday dedicated the Linac Coherent Light Source (LCLS), the world's most powerful X-ray laser, at the Department of Energy's SLAC National Accelerator Laboratory.

"The LCLS shows what the scientific workforce of our nation, in cooperation with our international partners, is capable of achieving," said Secretary Chu. "Pioneering research will remain critical if the U.S. is to stay a global leader when it comes to innovation and competitiveness."

Stanford University President John Hennessy spoke alongside Secretary Chu and other guests, including U.S. representatives Zoe Lofgren (D-San Jose) and Mike Honda (D-San Jose). "I'm struck by the many accomplishments of SLAC and the many ways the researchers here exemplify the pioneering tradition for which Stanford is known," Hennessy said. "For almost half a century, SLAC has been adventurous in its thinking, boldly launching new efforts in its search for knowledge. We're privileged to have this world-class research facility here at our university."

SLAC Director Persis Drell said, "We at SLAC could not have delivered the LCLS on our own; the Department of Energy, Stanford University and all our partners were always there when we needed them. And now we have a facility that is annihilating expectations. The early experiments are swimming in data and are already exploring new frontiers—the science is starting to flow."

The Linac Coherent Light Source is a new type of scientific facility that promises to revolutionize our view of the atomic world as it performs basic scientific research and drives applications in energy and environmental sciences, drug development and materials engineering. It is able to view matter on a scale of individual atoms, and on time scales fast enough to see atomic motion and changes in the chemical bonds between them, effectively making stop-motion movies of the basic processes of matter and life for the first time.

The LCLS is a \$420 million project funded by the DOE Office of Science with construction led by SLAC National Accelerator Laboratory in partnership with Argonne National Laboratory and Lawrence Livermore National Laboratory. Other national laboratories and universities provided significant support and components of the machine during the development of the LCLS. The American Recovery and Reinvestment Act of 2009 provided \$53.6 million to accelerate the construction of scientific instruments for the LCLS and to develop an additional instrument.

The idea of LCLS, which involves making ultra-bright, ultrafast X-ray pulses from a high-energy electron beam, was first conceived in 1992, with the notion that SLAC's existing linear accelerator

could potentially form the backbone of the laser. After much research and development, SLAC broke ground on the facility in October 2006. The LCLS's first X-ray laser light was created on April 10, 2009 and first experiments started a few months later. The results of those first experiments, conducted by hundreds of scientific users from around the world, have recently started to appear in high-profile scientific journals.

These early results have imaged bacteria and parts of the photosynthetic system found in plants. They have also stripped atoms such as neon completely bare of their electrons, from the inside out for the first time, which is made possible due to the high energy X-rays. Current and future experiments are investigating more complicated molecules and beginning to piece together the first movies of atomic dynamics in action.

The LCLS is a DOE Office of Science-funded project led by SLAC National Accelerator Laboratory in partnership with Argonne National Laboratory and Lawrence Livermore National Laboratory. Lawrence Berkeley National Laboratory and Cornell University contributed key subsystems. University of California, Los Angeles provided theoretical physics support throughout the project; Brookhaven and Los Alamos national laboratories were active in the early stages of LCLS research and development.

SLAC National Accelerator Laboratory is a multi-program laboratory exploring frontier questions in photon science, astrophysics, particle physics and accelerator research. SLAC is located in Menlo Park, Calif., and is operated by Stanford University for the U.S. Department of Energy Office of Science.