FNAL's Robert "Obie" Oberholtzer

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Research Highlights . . .

Wind turbine blade test facilities planned

DOE's National Renewable Energy Laboratory will work with consortiums from Texas and Massachusetts to design, build and operate new facilities to test the next generation of giant wind turbine blades. The ultimate goal is to test blades up to 330 ft. (100m) in length. Rapid growth in wind turbine size during the past two decades has outstripped the existing capabilities of NREL's National Wind Technology Center, which operates the only facility in North America capable of full-scale testing of megawatt-size wind turbine blades. NREL will continue testing blades at its facility in Colorado.

[Sarah Barba, 303/275-3023, sarah_barba@nrel.gov]

Next for sequencing: *Eucalyptus*

DOE's Oak Ridge National Laboratory and Joint Genome Institute are part of an ambitious international effort to decode the genome of *Eucalyptus*, one of the world's most valuable fiber and paper-producing trees and only the second tree to have its DNA sequenced. The DNA sequence of the 600-million-nucleotide tree genome will be generated under the auspices of DOE's JGI in a project co-led by ORNL's Gerald Tuskan. The genus *Eucalyptus* includes some of the fastest growing woody plants in the world and is one of the most widely planted forest trees in the world. *Eucalyptus* offers extraordinary opportunities for comparative genomic analysis with *Populus*, the first tree sequenced, which was published in the journal Science in 2006.

[Bill Cabage, 865/574-4399, cabagewh@ornl.gov]

Ultrasound technology tracks microbial growth in fermentations

An acoustic technology developed at DOE's Pacific Northwest National Laboratory eliminates the need for laborious and costly sampling of slurries in large containers. Fermentation-based industries, such as beer and pharmaceuticals, could benefit from the technology's non-invasive, continuous and objective "listening" technique in tracking microbial growth through the different process phases. This acoustic-based technology is attached to the outside of a large tank or vat, much like those used to make beer and medicinal drugs. It tracks the size and concentration of particles within opaque slurries. The ultrasound technology is also useful for measuring cell or organism growth and population in fermentations.

[Andrea Turner, 509/375-3893, andrea.turner@pnl.gov]

NETL develops next generation flame ionization sensor system

Researchers from the combustion and advanced sensors teams at DOE's National Energy Technology Laboratory have developed the next generation of flame ionization sensor for in-situ turbine combustion monitoring. The first generation of NETL's patented Combustion Control and Diagnostics Sensor (CCADS) senses flame flashback and lean blow out by measuring resistance across the flame. The new Intelligent CCADS Electronics system determines both the resistance and capacitance of a flame. The addition of the flame capacitance measurement is expected to improve the quantification of the fuel/air equivalence ratio in the combustor, a key parameter for ultra-low emissions performance.

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DOE Pulse highlights work being done at the Department of Energy's national laboratories. DOE's laboratories house world-class facilities where more than 30,000 scientists and engineers perform cutting-edge research spanning DOE's science, energy, national security and environmental quality missions. ***DOE Pulse*** (www.ornl.gov/news/pulse/) is distributed every two weeks. For more information, please contact Jeff Sherwood (jeff.sherwood@hq.doe.gov, 202-586-5806).

A breakthrough event at SLAC

On Wednesday, June 27, SLAC celebrated a major construction milestone for the Linac Coherent Light Source (LCLS). Tunneling crews broke through the final few inches of the Undulator Transport Hall into daylight after nearly three months and 560 feet of digging. The event marks partial completion of one end of the 1,700+ foot tunnel.

The event was webcast live from the construction site, a short video of which is now available here (Requires Real Player.) An interactive dashboard detailing the LCLS project is also available here.

Tunnel Crew

Upon completion in 2009, the LCLS will be the world's first hard X-ray free electron laser. By producing ultra-fast, ultra-bright pulses of X-ray light, scientists will be able to use the LCLS much as a camera's flash to freeze images of atoms and molecules in motion. Such processes occur on timescales that until now have been out of reach of even the most sophisticated instruments—molecules vibrate and react with each other on the order of quadrillionths of a second. Opening the door to this world of femtosecond dynamics will deepen our understanding of process such as how chemical bonds form and break and how electrons behave within atoms, potentially revolutionizing a range of fields from physics to biology and medicine.

The LCLS is a collaboration among SLAC, University of California Los Angeles, and Los Alamos, Argonne and Lawrence Livermore national laboratories.

Submitted by DOE's Stanford Linear Accelerator Center

'Obie' keeps search for Higgs running

Robert "Obie" Oberholtzer

More than 1300 physicists from all over the world use the Tevatron particle collider at DOE's Fermi National Accelerator Laboratory to search for the elusive Higgs particle, one of the greatest mysteries in particle physics. Scientists believe this hypothetical particle is key to explaining the origin of mass for elementary particles.

While scientists working on the collider experiments are often in the limelight, hundreds of engineers and technicians are crucial as well to keep the search for the Higgs particle going. Robert "Obie" Oberholtzer, Fermilab senior engineering associate, is one of the people at the laboratory who work around the clock to keep the Fermilab accelerator complex running day and night. When there is an electrical or mechanical problem with one of the accelerators, Oberholtzer is called in to help fix it.

"Obie is probably one of the leading contenders for the person most called to come in during off hours," said Roger Dixon, head of the Fermilab Accelerator Division. "He frequently spends a large fraction of his weekend at the lab solving electrical problems. If we come across something difficult, Obie is who we call."

Oberholtzer first came to the lab in 1968. He worked on the construction, installation and commissioning of the Antiproton Source, which supplies antiprotons for the collider experiments. He has applied his expertise to the accelerator complex ever since. In the 1990s, Oberholtzer worked on electrical components for the upgrade of the Linear Accelerator. During the construction of the Main Injector Accelerator he helped install five million feet of cable.

Keeping the Antiproton Source operational is one of Oberholtzer's many responsibilities today. Although he could retire, Oberholtzer promised he would stay until the Tevatron shuts down in a couple of years. "My job is interesting because I never have to do the same thing over and over," Oberholtzer said. "It's always something new and different." —Amelia Williamson

Submitted by DOE's Fermi National Accelerator Laboratory