Merrill Jones found Sandia "desolate" in 1948. Page 2

DOE Pulse

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Research Highlights . . .

Ancient artifacts: ODDSIMS may reveal just how old

Artifacts—arrowheads, spearpoints and such—made of obsidian, or volcanic glass, are found throughout Africa and Central America. Archaeologists over the years have had methods to date them, but their accuracy has been questionable, which also threw into doubt the age of the sites where the items were found. Researchers at DOE's Oak Ridge National Laboratory have developed a new dating method called ODDSIMS, for Obsidian Diffusion Dating with Secondary Ion Mass Spectrometry. ODDSIMS, which has produced matching results on artifacts that have been verifiably dated, could alter theories about the age of some ancient sites.

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Insulating between the lines

Efforts to manufacture cheaper, faster and smaller cell phones, digital cameras and other electronic devices have been hampered by the performance of semiconducting materials. As a result, industry is in search of improved insulating materials for use between the metal lines on silicon chips that minimize capacitance—charge buildup—as the metal lines are brought closer together. Lower capacitance can result in higher signal speed and lower power consumption. Now, researchers at DOE's Pacific Northwest National Laboratory have developed a porous, silica thin film with a nearly 50 percent reduction in capacitance over high-density silica, the industry standard. Researchers are teaming with Sematech, a major semiconductor consortium, to develop, test and evaluate the technology.

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When Is a crack a crack?

No one would ever think to throw milk out before the expiration date, but many metal components of our country's infrastructure are thrown out while they are still useful. Researchers at the DOE's Idaho National Engineering and Environmental Laboratory, in collaboration with the Massachusetts Institute of Technology, are developing a Fitness for Service predictive technology that can be used to more accurately figure "expiration dates" for metal structures that may crack normally with age. Using data from nondestructive testing on full-scale metal structures, the researchers are developing standards and predictions for surface cracks and welds. Accurate Fitness for Service predictions will likely extend the lifetimes of many structures.

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PNNL's silica thin film may boost communication technologies.

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).

'Chiba City' is largest scalable Linux testbed

DOE's Argonne National Laboratory is working with IBM and VA Linux Systems to build "Chiba City" — the largest supercomputing cluster dedicated to highly scalable open source software development. The 512-CPU Linux cluster will be opened to the U.S. research community, including universities, laboratories and industry.

The Chiba City Project, conceived by Argonne's Mathematics and Computer Science Division, will be Argonne's most powerful supercomputer. The project will help advance the use of state-of-the-art Linux clusters based on affordable industry standard components in high-performance computing. The cluster comprises 256 2-CPU computational servers from VA Linux Systems, and IBM Netfinity servers for cluster management, file storage and visualization.

The Chiba City cluster provides a flexible development environment for scalable open source software in four key categories: cluster management, high-performance systems software (file systems, schedulers and libraries), scientific visualization, and distributed computing.

The construction was planned and managed by engineers from Argonne and VA Linux Professional Services, with support from VA and IBM's cluster hardware and software experts. VA Linux also provided cluster management technology and certified new high-performance Linux drivers for the gigabit ethernet cards and graphics cards used in the scalable cluster.

The cluster installation was accomplished in a two-day "barn-raising" event, complete with banjo player. More than fifty Argonne scientists pitched in to help build the cluster, which links high-performance servers from VA Linux with advanced hardware from IBM and the latest in network interconnect hardware.

"The Chiba City barnraising is a great example of the kind of community spirit that the project will support," said Remy Evard, manager of advanced computing and networking in Argonne's Mathematics and Computer Science Division. "Linux clusters are attractive for their price and performance, but more importantly, Linux and open source tools enable our community to work together to tackle large-scale systems software challenges."

"Argonne's Chiba City is a milestone in large-scale Linux systems design, and demonstrates the flexibility and scalability of VA's ClusterCity architecture," said Dr. Larry M. Augustin, president and CEO of VA Linux Systems. "Chiba City will help advance open source projects such as VACM, the VA Cluster Manager, and will benefit the community immensely."

"The prospect of building supercomputer-class systems using commercially available Netfinity servers is an exciting one," said Tom Figgatt, Linux segment executive, IBM Netfinity Servers. "As demonstrated this week at Supercomputing '99 in Portland, IBM is working with the nation's premiere research institutions including Argonne to develop the technologies that will make this a reality."

The Chiba City effort is sponsored primarily by DOE's Office of Science. The project gets its name from the futuristic "Chiba City" in William Gibson's science fiction novel, "Neuromancer." For more information, contact Dave Jacque, Argonne Office of Public Affairs, 630/252-5582, info@anl.gov.

Submitted by DOE's Argonne National Laboratory

Sandia a 'desolate' place when Merrill Jones arrived in 1948

Sandia National Laboratories' recent 50th anniversary celebrations had unique meaning for one of the celebrants. Merrill Jones arrived at the high-desert lab site—then known as Z Division of Los Alamos Scientific Laboratory—nearly a year before the lab became independent, and has worked there during the DOE Labs' entire 50-year history as an independent lab.

"It was way out on the mesa" east of Albuquerque, he recalls, "and when the wind blew, rocks moved—literally moved" across the sparsely vegetated dirt landscape. "It looked truly desolate."

He came to Sandia from the Sylvania Electronic Products plant in Williamsport, Pa., where he had gone to work in 1944 to learn about something relatively new—microwaves and radar. By the time he finished the courses, though, the war had been over for a couple of years and Sylvania was closing the plant. The plant manager was trying to help employees find other jobs and heard about a lab in New Mexico "doing secret stuff" and recommended Jones look for work there.

His first job was in the electronic fabrication shop, called SLF2 (Sandia Lab Fabrication), and he moved to the Primary Standards Lab when that was established—although at that time it was known as the Sandia Standards Lab. He was the second person on the staff there, assigned to equip the lab for electrical calibration.

He had come to Sandia without a college degree, but a sympathetic superintendent made arrangements for him to attend classes at the University of New Mexico, and after wavering between physics and engineering for a while, he earned a degree with majors in mathematics and psychology. He later earned a master's degree in math with an emphasis on computer science.

He now works in the Testers and Experimental Ground Stations Department, designing and building testers for satellite subsystems and payloads.

Submitted by DOE's Sandia National Laboratories