



New LLNL Computer, A Work In Progress, Is World's Fastest

NNSA Employee Wins Service To America Award

The BlueGene/L supercomputer, scheduled for delivery to Lawrence Livermore National Laboratory (LLNL) starting in November, has surpassed NEC's Earth Simulator in Japan as the world's fastest supercomputer, according to IBM, its manufacturer.

Using the industry-standard LINPACK benchmark, the IBM BlueGene/L system attained a sustained performance of 36.01 Teraflops, eclipsing the three-year-

old top mark of 35.86 Teraflops for Japan's Earth Simulator. The milestone was attained during internal testing at IBM's production facility in Rochester, Minn.

"In July, I predicted that America would reclaim the lead in supercomputing and today it has," Energy Secretary Abraham said. "The announcement that BlueGene/L is now number one is just the tip of the iceberg. This achievement represents a deliberate long-term investment by

the Department of Energy in high performance computing technology for U.S. competitiveness. When complete, BlueGene/L will be eight to ten times faster than the Earth Simulator. America will be safer as this machine will significantly impact the Stockpile Stewardship program by helping to better understand the safety, performance and

For the second year in a row, an employee of NNSA has earned a prestigious Service to America medal.

Nicole Nelson-Jean, an NNSA employee who directs the DOE office in Tokyo, received the award for her nonproliferation work in Russia, including leading a delegation of U.S. security specialists and engineers to the Arctic Circle to build a multimillion dollar training and service center for Russian nuclear material and weapons security.

Asked about her reaction to the award, Nicole said, "It is a great honor and privilege to be recognized for something you love to do."

NNSA Administrator Linton Brooks was on hand to present Nelson-Jean with her medal. "The agreement she helped strike has led to the creation of a multimillion dollar facility in Russia, dedicated to ensuring that dangerous nuclear materials never fall into the wrong hands," he said. "We are proud of her outstanding work. Clearly the



BLUEGENE/L DESTINED FOR LLNL: Energy Secretary Abraham signs the first rack for the BlueGene/L supercomputer during a ceremony dedicating LLNL's new supercomputing facility in July. Looking on are LLNL Director Michael Anastasio and Dona Crawford, associate director for computation.

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LLNL Computer Is Fastest In The World

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surety of the enduring National Nuclear Stockpile.”

“We’re excited by this preview of coming attractions,” said Dona Crawford, LLNL’s associate director for computation. “The DOE and National Nuclear Security Administration have worked hard to bring this project to fruition. Building on a long history of working together on supercomputing projects, Lawrence Livermore and IBM are again forging new frontiers in high performance computing. This will bring important new capabilities to the lab’s national security missions for DOE and NNSA.”

Delivery of the first BlueGene/L racks to Livermore is scheduled for completion in spring of 2005.

The system’s cost - under \$100 million - is less than one-fourth the cost of the Earth Simulator, while requiring one-sixth as much electrical power and one-tenth the floor space.

Applications for BlueGene/L include protein science simulations, modeling of the aging and properties of materials, and turbulence phenomena.

BlueGene/L is a work-in-progress, with much larger systems planned for installation at IBM’s T.J. Watson Research Center and LLNL.

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Service to America Honors Russian Materials Security Effort

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best is yet to come from this remarkable young woman.”

One year after joining NNSA, Nelson-Jean facilitated the signing of the bilateral agreement to secure former Soviet nuclear materials and weapons. This agreement had been in negotiations for over a year and was at an impasse. Once the agreement had been signed, she began leading delegations of security specialists and engineers to the Arctic Circle to work with the Russian Navy to spearhead the establishment of the Kola Technical Center, which is the first multimillion dollar service and training center for securing nuclear material and weapons in Russia.

She worked with the Russian Navy and Russian contractors to develop training programs, technical center designs, and construction schedules. In the process, she gained the trust and respect of her Russian counterparts. As a result, this facility

will help ensure that weapons-usable material and weapons of mass destruction do not fall into the hands of terrorists.

The Service to America Medals were created in 2002 by the Partnership for Public Service,



SERVICE TO AMERICA MEDAL: Nicole Nelson-Jean, director of the DOE/NNSA Tokyo office, received the prestigious 2004 Service to America Medal, which honors the achievements of career federal employees. Mrs. Nelson-Jean, who was selected from 600 applicants, received the medal because of her invaluable contributions to the NNSA and U.S. national security.

a nonpartisan, nonprofit organization committed to revitalizing federal government service, and the Atlantic Media Company (publisher of Government Executive, National Journal and The Atlantic Monthly).

Secret Mission By U.S., Russia Recovers HEU

Eleven kilograms of enriched uranium fuel, including highly enriched uranium (HEU) that could be used for nuclear weapons, were safely returned to Russia from Uzbekistan in a secret mission conducted in September by the United States, Uzbekistan and Russia.

Secretary of Energy Spencer Abraham said, "The recovery, return and eventual elimination of this highly enriched uranium are an important milestone in our campaign to reduce this dangerous material worldwide."

The HEU was airlifted under guard from an airport near Tashkent, Uzbekistan to a secured facility in

Dmitrovgrad, Russia. There, the uranium will be down-blended to low

use in the Russian-designed 10 megawatt VVR-SM multi-purpose research reactor, located near the Uzbekistan capital, Tashkent.

During the one-day mission, approximately 11 kilograms of enriched uranium nuclear fuel, including HEU, were loaded into two specialized transportation containers provided by the Russian Federation. International Atomic Energy Agency safeguards inspectors and DOE/NNSA

technical experts were present in Uzbekistan to monitor the process of loading the fuel into the canisters.



HEU SECURED: The Institute of Nuclear Physics technicians bring a storage container with nuclear material to the reactor hall.

enriched uranium.

The nuclear fuel assemblies were originally supplied to Uzbekistan for

Livermore, Sandia Researchers Win Presidential Early Career Awards For Outstanding Work

Two Lawrence Livermore National Laboratory (LLNL) staff members and a Sandia National Laboratories researcher were among 57 young scientists from around the country to be selected for a Presidential Early Career Award for Scientists and Engineers (PECASE), the nation's highest honor for outstanding scientists and engineers embarking on an independent research career.

Brian Wirth, a former LLNL employee currently on the faculty at UC Berkeley, received the award for his work in computational dynamics studies of dislocations and defects in metals. Prior to joining the faculty at UC Berkeley, Wirth spent three years

at LLNL and he continues to interact closely with LLNL researchers.

Catherine Snelson, from the University of Nevada, Las Vegas was honored for her contributions to the characterization of the geologic structure of the Las Vegas basin. She is a close collaborator with LLNL on research related to assessing underground test readiness at the Nevada Test Site (NTS), helping to quantify the level of ground motion in Las Vegas for potential future tests at NTS.

Dr. Tamara Kolda is an applied mathematician and computational scientist at Sandia-California. She

was acknowledged for bringing great energy and creativity to her significant contributions in diverse areas. Her research interests include optimization, nonlinear equations, tensor decompositions, graph algorithms, parallel computing and the design of scientific software.

Established in 1996, the PECASE program recognizes some of the finest scientists and engineers who, while early in their research careers, show exceptional potential for leadership in the frontiers of scientific knowledge during the twenty-first century.

NNSA Completes First Shipment To Test Site

NNSA has successfully completed the first shipment of nuclear materials from Los Alamos National Laboratory Technical Area 18 (TA-18) to the Device Assembly Facility at the Nevada Test Site.

The shipment was completed in accordance with federal and state transportation regulations. "Completion of this programmatic material shipment to Nevada re-enforces NNSA's commitment to relocate TA-18 activities to a newer, more secure location," said Dr. Everet Beckner, deputy administrator for defense programs. "NNSA remains focused on consolidating TA-18 nuclear materials in a manner that supports safety and security requirements."

NNSA plans to have the most sensitive nuclear materials out of the TA-18 inventory by September 2005, and the rest by 2008.

The TA-18 complex has the nation's only facilities capable of performing general-purpose nuclear materials handling and criticality experiments. These experiments provide unique training to a variety of federal agencies in areas such as nuclear materials safety, emergency response in support of counterterrorism activities, and safeguards and arms control in support of programs aimed at controlling excess nuclear materials.

NNSA announced in December 2002 that the TA-18 mission would be moved to the high security Device Assembly Facility.

HEU Transparency Program Marks Three Major Milestones

American and Russian officials have reached three important milestones of the Highly Enriched Uranium (HEU) Transparency Implementation Program (TIP), marking progress in eliminating weapons-usable material from the Russian nuclear stockpile and converting it to low-enriched uranium (LEU) for use in U.S. nuclear power plants.

The milestones are the elimination to date of 230 metric tons (MT) of weapons-origin HEU from the Russian stockpile, the fifth anniversary of the operation of a U.S. Blend Down Monitoring System at the Russian Urals Electrochemical Integrated Plant (UEIP), and the eighth year of operation of the HEU TIP Transparency Monitoring Office at the UEIP.

The goal of HEU TIP is to provide confidence that Russian LEU sold to the United States is actually derived from weapons-origin HEU. The Blend Down Monitoring Systems installed at some of the Russian facilities and the monitoring activities carried out by the Transparency Monitoring

Office are two of the mechanisms used to provide this confidence.

Under the 1993 U.S.-Russian HEU Purchase Agreement, HEU from dismantled Russian nuclear warheads is permanently eliminated by converting it to LEU, which is not a proliferation concern. The resulting LEU is sold as fuel to U.S. nuclear power plants through the U.S. Executive Agent, the United States Enrichment Corporation (USEC). Material purchased through this program provides 50 percent of the nuclear fuel used each year in the United States, which represents 10 percent of the total U.S. electricity production. Russia has received more than \$4.5 billion to date for the LEU delivered and the program is on track for successful completion in 2013, when the last of the 500 MT of HEU will be converted. To date, 230 MT have been eliminated, enough HEU to make 9,200 nuclear weapons.

For more information concerning the conversion transparency program, see the HEU TIP website at <http://heu.llnl.gov/>.

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Los Alamos Instrument Survives Satellite Crash, Provides Important Scientific Data

When the Genesis satellite crashed to the Utah desert floor in September, Los Alamos National Laboratory (LANL) staffers were watching closely, knowing one of the core science tools aboard, the Los Alamos solar wind concentrator, was at risk. Hitting the ground at 193 mph, Genesis was battered, “but it went out and did its job, it returned samples,” said lead Los Alamos scientist Roger Wiens.

Wiens is a member of the International, Space and Response division of the LANL Threat Reduction directorate.

Since then, Wiens has been proven correct. On October 4, NASA announced the successful transfer of the science samples from a crash-site clean room in Utah to Johnson Space Center in Houston, Texas. A major milestone in the process was the recovery of the four segments of the concentrator target, designed and built at Los Alamos. Designed to measure the isotopic ratios of oxygen and nitrogen, the segments captured the most important samples.

“Retrieving the concentrator target was our number one priority,” said Eileen Stansbery, Johnson Space Center assistant director of astromaterials research and exploration science. “When I first saw three of the four target segments were intact, and the fourth was mostly intact, my heart leapt. Inside those segments are three years of the solar samples, which to the scientific community, means eons worth of history of the birth of our

solar system.”

Genesis carried three science instruments, two of which were developed at Los Alamos, and was launched in 2001 from Cape Canaveral, Fla. It traveled to an area in space between Earth and the Sun where the gravity of the two bodies is balanced. There, it

collected solar wind particles. The particles were embedded in high-purity wafers of sapphire, silicon, diamond and other materials.

In addition to the solar wind concentrator, Los Alamos equipment aboard the craft included two toaster-sized ion monitors that would signal to the satellite when to position its mobile solar-particle-collection panels. Thanks to these monitors,



LOS ALAMOS CONCENTRATOR SURVIVES CRASH: The NASA Genesis satellite, designed to capture solar wind particles in space for two years and return the samples to Earth, succeeded in its mission with a hard landing in the Utah desert. The core science tool aboard, a solar wind concentrator, designed and built at LANL, survived with its precious cargo. LANL technician Juan Baldonado and principal researcher Roger Wiens examine the concentrator, extracted from the wrecked return module.

Genesis is the first spacecraft to have determined three key solar wind types and acted upon the data without input from the ground. The monitors remained in space aboard the main body of the satellite when it jettisoned from the return capsule.

Management Team Complete At NNSA Service Center

The NNSA Service Center in Albuquerque, N.M. has completed its management team with the addition of Dennis Martinez as the field chief financial officer. Martinez was previously deputy manager of the Los Alamos Site Office. The Service Center provides NNSA's eight site offices and headquarters with standardized business and administrative services in contracting, human resources, finance, legal and public affairs. It also provides technical expertise in the areas of environment, safety and health.



SERVICE CENTER MANAGERS: (left to right) Larry Kirkman, associate director, Office of Federal Services; Frank Baca, Service Center deputy director; Elizabeth Osheim, chief counsel; Debby Miller, associate director, Office of Business Services; Mike Zamorski, associate director, Office of Institutional Affairs; Ray Corey, associate director, Office of Technical Services; Karen Boardman, Service Center director; and Dennis Martinez, director, Office of Field Financial Management.

NNSA Expands Efforts To Combat Illicit Smuggling

NNSA recently announced it is expanding efforts to train border guards and customs officials worldwide to combat the threat posed by the illicit smuggling of Weapons of Mass Destruction (WMD)-related equipment and technology. NNSA's export control office has designed a new Commodity Identification Training curriculum to educate and train customs inspectors and border enforcement personnel from around the world in techniques of detection and interdiction. This program supports the priority to prevent illicit trade in items and technologies needed to manufacture WMD.



PUMPKIN BASH: Pantex Site Office Manager Dan Glenn participated in the pumpkin carving contest at Pantex's "Pumpkin Bash" social. The contest participants randomly picked the subject they were to carve out of a hat. Glenn drew "a likeness of your boss."

Livermore And Los Alamos Scientists Win E.O. Lawrence Awards For Nuclear Science Work

Lawrence Livermore National Laboratory astrophysicist Claire Max and Los Alamos National Laboratory scientists Bette Korber, Fred Mortensen and Greg Swift have been awarded Ernest Orlando Lawrence Awards for 2004 by the Department of Energy.

Max will receive the award in the physics category for her contributions to the theory of laser guide star adaptive optics and its application in ground-based astronomy to correct telescopic images for the blurring caused by light passing through the atmosphere. She currently divides her time between the institute and UC Santa Cruz, where she is a professor and deputy director for the Center for Adaptive Optics.

Korber is a technical staff member in the Theoretical Division's Theoretical Biology and Biophysics (T-10) Group. She received the Lawrence Award in the Life Sciences category for her

pioneering studies of the genetic characteristics of the HIV virus after its transmission from mother to child, during the progression of the disease,

and within different tissues in the host; as well as for her development of the Los Alamos HIV database, which forms a foundation for HIV research for the global scientific community. She is also part of the external faculty at the Santa Fe Institute.

Fred Mortensen is a technical staff member in the Applied Physics Division's Thermonuclear

Applications (X-2) Group. He received the Lawrence Award in the National Security category for his technical contributions in nuclear weapons design. His leadership and expert judgment that have enabled the continued certification of the safety and reliability of nuclear weapons in an era without nuclear testing.

Greg Swift is a technical staff member in the Materials Science and Technology Division's Condensed Matter and Thermal Physics (MST-10) Group.

Swift received the Lawrence Award in the Environmental Science and Technology category for his record of

experiments leading to a better understanding of the superfluid state and for the development of thermoacoustic engines. He is a Fellow of

the Acoustical Society of America and was the recipient of that organization's silver medal in Physical Acoustics in 2000.

Other recipients of this year's awards include Richard Saykally (chemistry) of Lawrence Berkeley National Laboratory and UC Berkeley; Ivan Schuller (materials research), UC San Diego; and Nathaniel Fisch (nuclear technology), Princeton Plasma Physics Laboratory.

The E.O. Lawrence Award was established in November 1959. The award honors exceptional contributions to the development, use, or control of nuclear energy (broadly defined to include the science and technology of nuclear, atomic, molecular, and particle interactions and effects). Each award recipient receives \$50,000, a gold medal and a citation signed by the Secretary of Energy.

The E. O. Lawrence Award was established in November 1959. The award honors exceptional contributions to the development, use or control of nuclear energy.



E.O. LAWRENCE

NNSA Assists Security Success At 04 Olympics

A joint initiative between the Greek government and NNSA successfully protected the 2004 Olympics and the Paralympics from nuclear and radiological threats. The agency's contributions included strengthened security at Greek border crossings, seaports, airports and sensitive locations and facilities. NNSA also provided a large number of handheld radiation detectors and assisted security in other areas.

NNSA representatives and the Greek Atomic Energy Commission (GAEC) met recently to commemorate this successful collaboration. Professor Leonidas Carmarinopoulos, president of the GAEC, and NNSA Deputy Administrator for Defense Nuclear Nonproliferation Paul Longworth, met at the GAEC's headquarters to

honor this significant achievement and recognize the experts that were part of this historic collaboration.

In response to a 2003 GAEC request via the International Atomic Energy Agency, NNSA worked with Greek colleagues to enhance the security of the Demokritos research reactor and to install radiation detection equipment at five locations, including the new Athens international airport and the port of Piraeus. GAEC and NNSA further cooperated to upgrade security at medical and industrial facilities, and to enhance the capabilities of incident response personnel by providing handheld radiation detectors as well as training in their uses.

Longworth thanked Greek officials for their professional and hospitable collaboration with NNSA security

specialists. "The global security of nuclear and other radioactive material is a shared responsibility. The U.S. is proud to collaborate with Greece and other countries to help enhance global security," Longworth said. He further noted that while the recently implemented security enhancements supported security during the Olympic Games, the enhancements will continue to deter and protect against terrorist attacks using nuclear or other radioactive material.

Following the meeting with GAEC President Carmarinopoulos, he and Longworth visited the Demokritos nuclear research reactor where they observed a demonstration of the reactor's new security system.

Pantex Wins P2 Award For Community Outreach

BWXT Pantex was recently honored by NNSA with a pollution prevention (P2) award. Pantex competed with DOE facilities across the country for these awards.

Pantex was honored for its Pollution Prevention Outreach and Public Awareness programs. This category honors outstanding achievement of pollution prevention or recycling education, training or technology transfer to other DOE employees, contractors, programs or sites.

"This award signifies an exceptional contribution to Pantex's and the department's efforts to make a positive impact on the local community," said NNSA Principal Deputy Administrator Jerry Paul. "I am extremely impressed with the

effort and ingenuity that went into this work by the pollution prevention team and the multiple partnerships they have formed to produce this outstanding result."

The Pantex P2 Team was honored for its work to raise awareness among the local community through school presentations and community partnerships.

The P2 team gave presentations on recycling to fifth graders throughout the



OUTREACH TEAM: Front row, from left, Julie Marlar, Roxanna Hamilton, Bill Allen, Allen Price, Don Maxie and NNSA Principal Deputy Administrator Jerry Paul. Back row, from left, Mike Mallory and Mike Sweitzer.

Amarillo Independent School District. One program, the Voyage of the Mimi, focuses on teaching the fifth graders the four Rs -- how to reduce, reuse, recycle and rebuy.