Los Alamos NATIONAL LABORATORY EST.1943

NewsLetter

Week of July 16, 2007

Vol. 8, No. 15

Lab captures R&D 100 awards

Los Alamos researchers won two of *R&D Magazine's* prestigious 2007 R&D 100 Awards. The award-winning Laboratory projects this year include the Camera on a Chip and the Portable Acoustic Cytometer.

These latest winners bring the Laboratory's total to 105 awards since the Laboratory began entering innovations in the competition in 1978.

"I am impressed with and proud of the ingenuity of our R&D 100 award winners," said Laboratory Director Michael Anastasio. "The awards demonstrate the Laboratory's powerful role in developing innovative concepts and translating them into practical solutions."

The R&D 100 Awards program honors significant commercial promise in products, materials, or processes developed by the research and development community worldwide. Each year, Illinois-based R&D Magazine recognizes the 100 scientific and technological advances from around the world with awards for innovations showing the most significant commercial potential. R&D Magazine uses technical experts to judge the submissions and officially presents the awards during a ceremony in October.

To read about all of the technologies submitted for an R&D 100 Awards, see pages 3 through 5.

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Laboratory scientists Roger Wiens and John Bernardin of Space Science and Applications remove the lens cover from the ChemCam Mast Unit. *Photo by Richard Robinson, Records Management/Media Services and Operations*

Mars Rover laser tool ready for testing

Los Alamos ChemCam to vaporize rocks on Mars to determine composition

by Nancy Ambrosiano

Mars mission Job One: Get there. Job Two: Find rocks and zap them with your laser tool. Now learn the nature of the debris by spectrographically analyzing the ensuing dust and fragments. It's every kid's dream, vaporizing pebbles on other planets, and thanks to a team at the Laboratory, it's going to happen.

When the JPL-NASA Mars Science Laboratory rover launches in 2009, it will carry this combination laser-telescope unit and enable the gadget-packed rover to know a great deal about rocks in its general vicinity. The ChemCam package includes a mast unit, projecting above the rover with a laser and telescope, and a body unit, the brains of the beast, with three spectrographs and the instrument controls.

The engineering model of ChemCam's mast unit, fresh from Thales Laser and Centre d'Etude Spatiale des Rayonnements (CESR) in France, is undergoing rigorous testing at Los Alamos. A team of six French experts is checking out the mast unit and making sure that it is properly connected with the rest of the instrument, built at Los Alamos. This fall the entire instrument will be shipped to the Jet Propulsion Laboratory, where more tests will take place and additional equipment will be added.

"We're pioneering a new technique for exploring Mars. It's really exciting to see the whole thing come together," said Roger Wiens of Space Science and Applications (ISR-1) and project lead.

The ChemCam laser emits very short pulses of 7 nanoseconds, through a small telescope that focuses the beam to a spot where the power density exceeds 10 megawatts per square millimeter, producing a plasma of vaporized material from the target rock. The unit operates on targets at distances between 4 and 30 feet. The unit also contains a camera to take extreme close-up pictures of the targets to show geologic context for each sample. The telescope and electronics were built by CESR, a research institute in Toulouse, France. The mast unit was funded by CNES, the French Space Agency. The full ChemCam flight model will be delivered to JPL in spring 2008.

Scheduled to launch in the fall of 2009, Mars Science Laboratory is part of NASA's Mars Exploration Program, a long-term effort of robotic exploration of the red planet. Mars Science Laboratory is a rover that will assess whether Mars ever was, or is still today, an environment able to support microbial life. In other words, its mission is to determine the planet's habitability.

For Your Safety

Shelter-in-place standard revised

by Cynthia Casados

The Laboratory's Shelter-In-Place standard recently was revised and the requirements were updated. The revised standard is available through the Policy Office Web site at *http://http://policy.lanl.gov/* online.

Shelter-In-Place is a short-term protective action in response to some kind of adverse weather condition, airborne hazard or other hostile environment. The standard includes a description of the entire process to plan for, respond to, and moderate potential consequences of an emergency that would require sheltering-in-place as a "protective action."

All employees should be familiar with the Shelter-In-Place standard. The Emergency Operation Center and the incident commander are trained to make decisions concerning Shelter-In-Place verses evacuation. Shelter-In-Place plans should be designated for all occupied structures at the Laboratory. The plans should designate locations for Shelter-In-Place rooms and make provision for equipment and supplies.

For more information or questions regarding Shelter-In-Place, contact Diane Senutovitch of Emergency Planning and Preparedness (ER-EPP) at 7-6211, or *dianems@lanl.gov* by e-mail. She can assist in identifying the facility operations director emergency operations specialist assigned to facilities.

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NewsLetter

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Los Alamos National Laboratory is a multidisciplinary research institution engaged in strategic science on behalf of national security. The Laboratory is operated by a team composed of Bechtel National, the University of California, BWX Technologies and Washington Group International for the Department of Energy's National Nuclear Security Administration.

Los Alamos enhances national security by ensuring the safety and reliability of the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction, and solving problems related to energy, environment, infrastructure, health and global security concerns.

NNSA National Nuclear Security Administration

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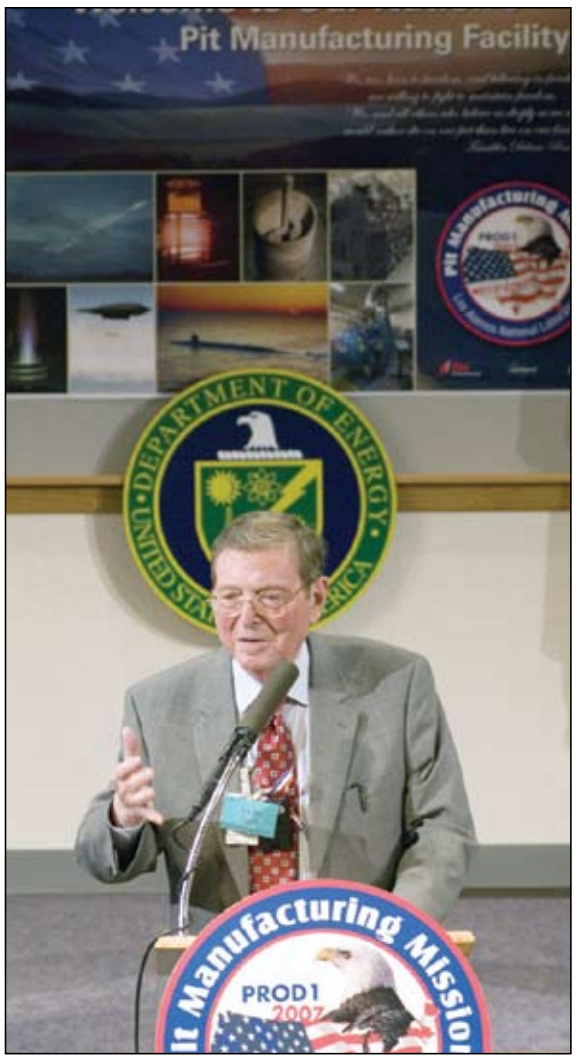


U.S. Senator Pete Domenici talks to employees in the PF-1 Auditorium at Technical Area 55. *Photo by Mick Greenbank, Records Management/Media Services and Operations*

Dignitaries witness second W88 'diamond stamp'

As part of a day-long W88 pit delivery celebration, Senator Pete Domenici and Congresswoman Heather Wilson looked on while Quality Assurance officials from the National Nuclear Security Administration "diamond stamped" a second W-88 pit at Technical Area 55, accepting it for inclusion into the nation's nuclear weapons stockpile.

The first "diamond stamp" came in early June. That pit already has been delivered to the Pantex plant in Amarillo, Texas, for assembly into a W88 warhead. The Laboratory is on schedule to deliver 10 such pits this year.

Domenici and Wilson were joined at TA-55 by U.S. Marine Corps Gen. James Cartwright, head of U.S. Strategic Command; Dan Glenn, Los Alamos Site Office manager, standing in for Bill Ostendorff, acting NNSA administrator, who could not attend; and Steve Henry from the Department of Defense.

After a short tour of the Plutonium Facility-4 at TA-55, and witnessing the diamond stamping, the dignitaries joined Laboratory Director Michael Anastasio and Principal Associate Director for Nuclear Weapons Programs Glenn Mara in the TA-55 auditorium to congratulate employees who had a role in the W88 pit production program.

Following a day-long W88 pit delivery celebration, U.S. Senator Pete Domenici, Congresswoman Heather Wilson, and Laboratory Director Michael Anastasio met with local reporters. At the news conference all three emphasized the role of all the scientists, technicians and support staff who made this accomplishment happen. Domenici and Wilson spoke to the media about the current budget situation and explained the importance of stockpile stewardship, the Chemistry and Metallurgy Research Replacement project, and the Reliable Replacement Warhead project. *Photo by LeRoy N. Sanchez, Records Management, Media Services and Operations*

U.S. Senator visits Laboratory for briefings

U.S. Senator Bill Nelson, left, and Laboratory Director Michael Anastasio chat as they walk into the Nonproliferation and International Security Center. Nelson, D-Florida, is chairman of the subcommittee on strategic forces of the Senate Armed Services Committee and was at Los Alamos for a series of classified briefings on Laboratory programs. He also toured several Laboratory facilities. The Government Affairs Office coordinated Nelson's visit. *Photo by Mike O'Keefe, Records Management/Media Services and Operations*

Laboratory captures R&D 100 Awards

Camera on a chip

Camera on a Chip is a 2-centimeter by 2-centimeter "hybrid chip," a combination of a microelectronic chip with a 720×720-pixel array of silicon photosensors and a metal-oxide-semiconductor (CMOS) chip with a corresponding array of control-and-processing circuits. The resulting device achieves performance far exceeding that possible with either of those technologies alone. It has light-detection (quantum) efficiency of greater than 90 percent from 450 to 650 nanometers, a minimum exposure time of 50 nanoseconds, and a minimum interframe time of 300 nanoseconds. The camera can be triggered to capture frames at the times of greatest interest during a fast event or an event with changing time scales. It also stores three frames "on-chip" and is relatively insensitive to the stray radiation normally present in radiography experiments. It gives scientists a single sub-microsecond imaging tool that combines 20 years of advances in silicon CMOS microelectronics and photosensor technology.

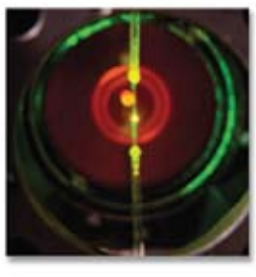
Applications

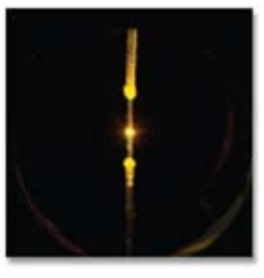
- Making radiographic movies of ultrafast phenomena, with protons (instead of X-rays) as the illuminating source
- Capturing events that start slowly but evolve rapidly, such as the behavior of slowly cooked high explosives
- Producing high-speed movies of fast processes over a wide range of visible or near-visible wavelengths

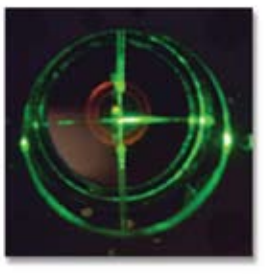
Team members: Kris Kwiatkowski of Neutron Science and Technology (P-23); Christopher Morris of Subatomic Physics (P-25); and Vincent Douence, Atul Joshi, and Yibin Bai of Teledyne Imaging Sensors

Portable Acoustic Cytometer

The Portable Acoustic Cytometer is the world's first truly portable and affordable flow cytometer. The instrument uses acoustic waves instead of a complex fluidics system to focus the cells into a tight stream for analysis. Acoustic focusing concentrates the cells as they are focused and gives the cells more time in the laser beam, making possible both greater throughput and greater sensitivity. The cytometer's capabilities surpass those of conventional flow cytometers without the complex and expensive components that drive up their size, complexity, and cost. In addition, the Portable Accoustic Cytometer eliminates the need for large volumes of purified water, a scarce resource in many parts of the world and brings the diagnostic power of high-performance flow cytometry to more researchers and health-care providers around the world.







Applications

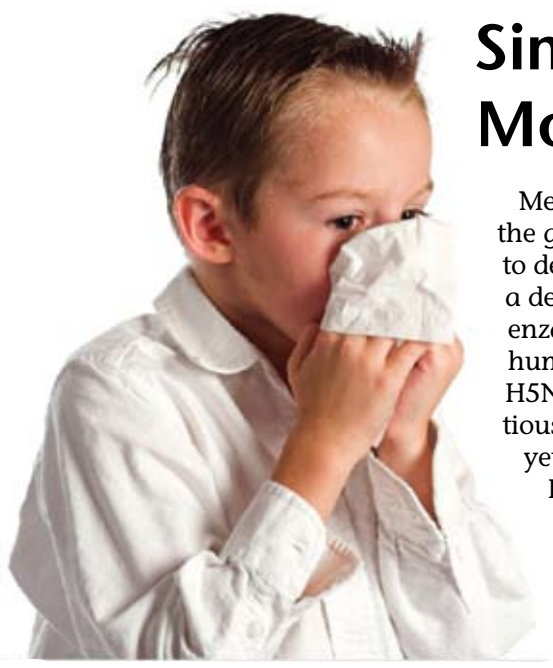
The Portable Acoustic Cytometer can be used for any of the analyses currently done with conventional flow cytometers in research and clinical laboratories:

- High-throughput screening of potential new drugs
- Typing blood cancers and analyzing compatibilities for tissue transplants
- Screening for cancer markers or infectious agents
- Monitoring cell populations and subpopulations to assess patients' responses to anti-retroviral or chemotherapy drugs

Team members: Steven Graves, Robert Habbersett, John Martin, Mark Naivar, Gregory Goddard, Gregory Kaduchak, and Michael Ward of Advanced Measurement Science (B-9); and Kristin Martinez of Acoustic Cytometry Systems

Other nominations

EpiCast: Epidemiological Forecasting Simulation Model



Medical researchers around the globe are racing the clock to develop a vaccine to combat a deadly strain of avian influenza that could trigger a global human pandemic. While the H5N1 avian virus is highly infectious among birds, it has not yet spread among humans. However, the fear is it could soon mutate into a form that can. To help epidemiologists understand the spread and impact of the next influenza pandemic, Laboratory researchers developed EpiCast (Epidemiological Forecasting), a software package that creates a synthetic model population based on census data, randomly assigning "virtual people" to households, workplaces, schools, and other community settings in which disease transmission could occur.

Each person has an individual probability for infection and can become infected or infect others. Taking advantage of EpiCast's unprecedented level of detail, epidemiologists have successfully evaluated various medical and nonmedical mitigation strategies that could be used to counter a pandemic influenza outbreak.

Applications

- Obtaining realistic preparation and response data for policy makers and health officials to develop mitigation strategies to counter potential pandemics
- Modeling potential bioterrorist attacks to enable development of preparation and response strategies
- Simulating alternative models such as social epidemics (trends in crime and drug use), idea adoption behaviors, etc.

Team members: Timothy Germann of Solid Mechanics, EOS, and Materials Properties (X-1-SMMP); Kai Kadau of Explosives and Organic Materials (T-14); and Catherine Macken of Theoretical Biology and Biophysics (T-10)

continued on Page 4

Laboratory captures ...

Super CNT Fibers

Spun from carbon nanotubes—the strongest, stiffest material known—Super CNT Fibers have one-tenth the density and four to five times the specific strength (strength per density) and specific stiffness (stiffness per density) of the best carbon fibers now used to make advanced structural composites. Laboratory researchers achieved this superior performance by spinning Super CNT Fibers from ultralong (~1 millimeter) carbon nanotubes that have only two walls and a hollow center, giving them low density.

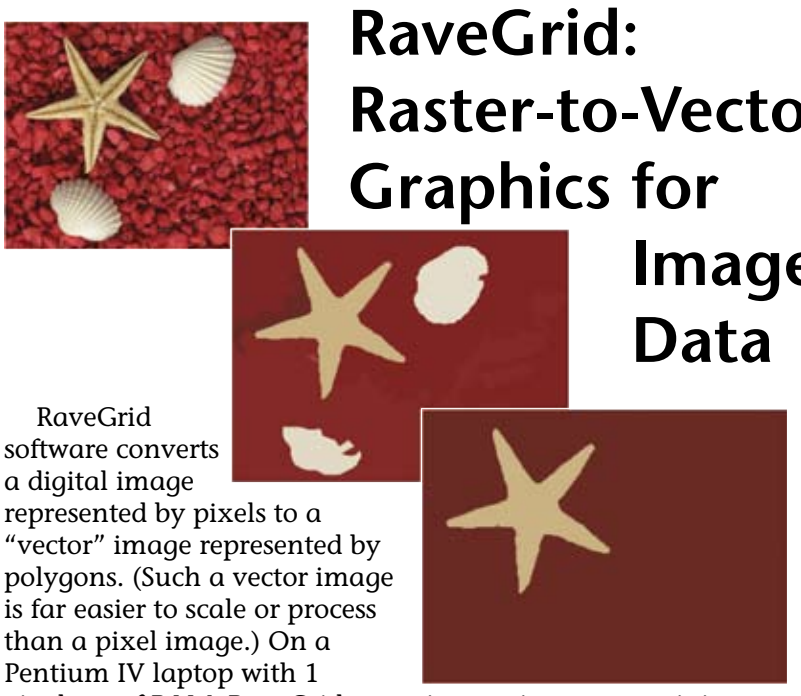
The use of Super CNT Fibers will ultimately increase the fuel efficiency of commercial aircraft by reducing aircraft weight and increase the stealthiness of combat aircraft by reducing aircraft radar cross-section. The use of these fibers also will reduce space-launch costs by reducing the weight of rockets and spacecraft, and improve sports-equipment performance by reducing weight and increasing strength and stiffness.

Applications

Super CNT Fibers will enhance the performance of the advanced carbon-fiber structural composites used in

- aircraft,
- spacecraft,
- automobiles, and
- sports equipment.

Team members: Yuntian T. Zhu, Paul N. Arendt, Raymond F. DePaula, Qingwen Li, Dean E. Peterson, Chris Sheehan, Xeifei Zhang, and Lianxi Zheng of the Superconductivity Technology Centerr (MPA-STC); and Robert O'Leary, Timothy Clapp, and P. Douglas Kirven of CNT Technologies Inc.



RaveGrid: Raster-to-Vector Graphics for Image Data

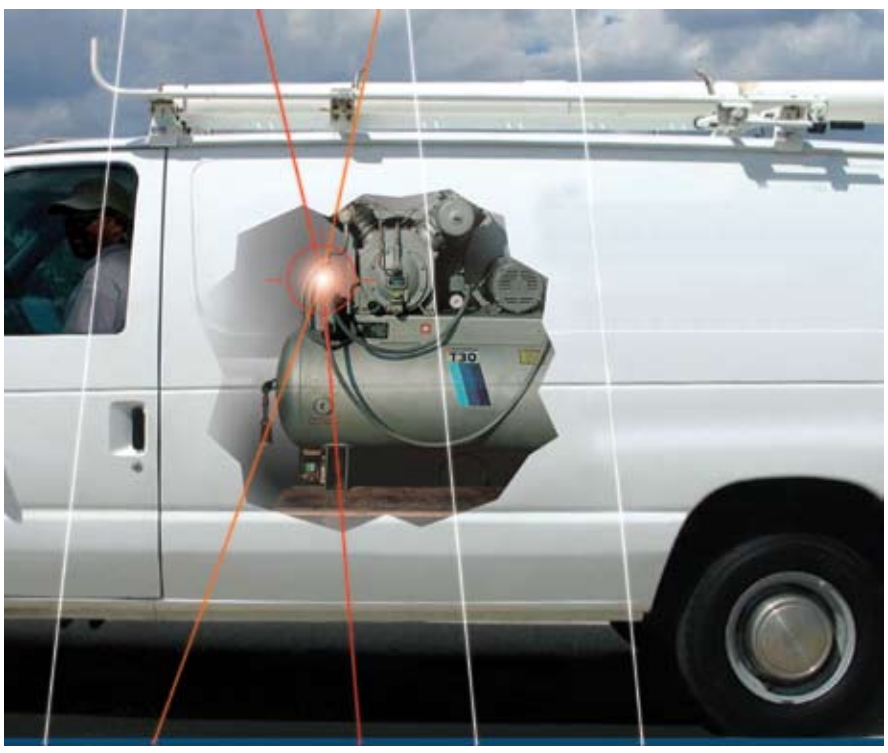
RaveGrid software converts a digital image represented by pixels to a "vector" image represented by polygons. (Such a vector image is far easier to scale or process than a pixel image.) On a Pentium IV laptop with 1 gigabyte of RAM, RaveGrid vectorizes an image containing up to 20 megapixels at a rate of 0.5 megapixel per second. RaveGrid also compresses an uncompressed pixel image as it vectorizes the image, typically reducing storage requirements by a factor of 4. RaveGrid also can identify objects in an image from specified criteria such as size, shape, or color. RaveGrid is compatible with the new scalable vector graphics (SVG) standard of the World Wide Web Consortium as well as with the Encapsulated Postscript (EPS) format.

Applications

RaveGrid enables

- image scaling to the pixel resolution of a particular digital display or Web-page layout;
- image compression to reduce image-storage or bandwidth requirements;
- encryption of vectorized images in text files;
- image searches in large databases or on the Internet; and
- automatic analysis of reconnaissance or surveillance images.

Team members: Lakshman Prasad of Space and Remote Sensing (ISR-2) and Sriram Swaminarayan of Computation Physics and Methods (CCS-2)



Muon Tomography Scanner

Los Alamos's muon tomography scanner uses ambient cosmic-ray muons as the radiographic probe to scan cargo for high-density threat materials such as uranium or plutonium. The scanner plots the incoming muons' initial trajectories, then registers all outgoing muons on the opposite side and correlates them to the first measurements. The software compares the muon-track plots and notifies the operator when it determines that outgoing muons have been deflected by a dense object within the scanner. The complete scan and data analysis are conducted in less than one minute—allowing customs officials to maintain border security without impeding commercial traffic flow.

Applications

The muon tomography system can scan

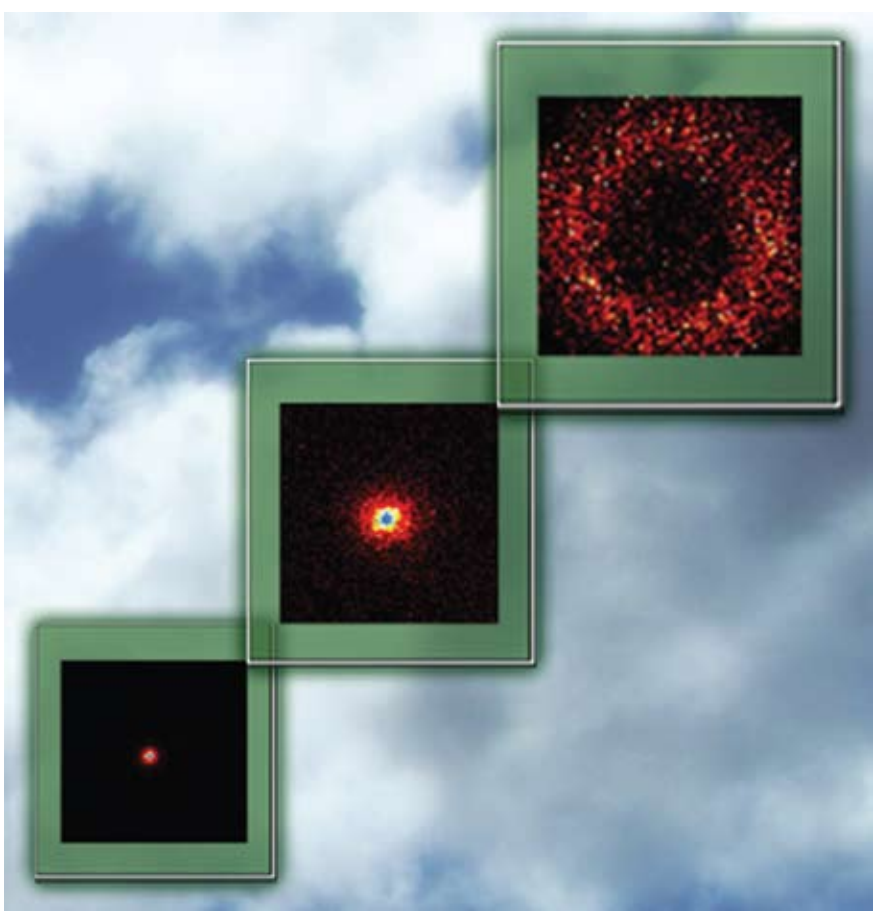
- tractor-truck trailers at border-crossing points, and
- cargo containers as they are unloaded at port facilities and airport cargo terminals.

Cities and high-security installations also can use these scanners to provide highly selective protection of their geographic area and people.

Muon tomography scanners will greatly increase border security against nuclear threat materials by

- detecting unshielded materials via emissions and density,
- detecting shielded materials via density without additional radiation dose, and
- performing the scan quickly without additional risk to personnel.

Team members: Christopher Morris, Charles Alexander, Jeffrey Bacon, Deborah Clark, Camilo Espinoza, Jacqueline Gonzales, Jesse Green, Gary Hogan, Mark Makela, Jason Medina, Patrick McGaughey, Fawn Pazuchanics, and Richard Schirato of Subatomic Physics (P-25); Konstantin Borozdin and Mark Galassi of Space Science and Applications (ISR-1); Rick Chartrand of Mathematical Modeling and Analysis (T-7); Andrew Fraser of of Space and Remote Sensing (ISR-2) ; Nicolas Hengartner and John Orum of Information Sciences (CCS-3); William Priedhorsky of Laboratory Directed Research and Development (LDRD-PO); Larry Schultz of Applied Modern Physics (P-21); Michael Sossong of Transport Applications (X-1-TA); Gary Blanpied of the University of South Carolina; and Alexei Klimenko of Passport Systems Inc.



WAIL: A Groundbreaking Approach to Ground-Based Cloud Probing

Wide-Angle Imaging Lidar, or WAIL, is a ground-based lidar system specifically designed for probing dense clouds. Like standard lidar, WAIL uses a vertically aimed pulsed laser to illuminate the atmosphere and a receiver to collect the laser photons that are scattered back to Earth. Because its receiver collects only those photons that strike the cloud base and travel straight back along the beam, standard ("on-beam") lidar reveals primarily a cloud's height. In contrast, WAIL works "off-beam." Its receiver collects photons that have scattered throughout the entire cloud and have returned from large distances beyond the incident beam. Therefore, WAIL's signal carries information from deep inside the cloud, and users can infer cloud thickness and mean opacity in addition to height.

Applications

- Probing clouds to increase the understanding of their role in the global climate system and hydrological cycle
- Assessing how clouds and fog affect atmospheric visibility for aviation safety
- In the future, environmentally supporting troops confronted with fog, dust, sand, smoke, and other impediments to visibility
- Also in the future, probing any strongly scattering medium in the environment such as turbid coastal waters, sea ice, snow, icy moons such as Jupiter's Europa, and so on.

Team members: Anthony B. Davis, Thomas Hale, Cheng Ho, and Steven P. Love of Space and Remote Sensing (ISR-2); and Igor N. Polonsky of Colorado State University (a former Lab employee)

Los Alamos National Laboratory R&D 100 Award Winners 1978 through 2006

1978: Diamond Machining of Optics; Electronic Identification System; and Electronic Device for Treating Tumors—Hyper Thermic Cancer Treatment

1980: Wee Pocket Radiation Detector and Portable Multichannel Analyzer

1981: Radio Frequency Quadrapole Linac

1982: WC Field Computer System

1983: Transuranic Waste Assay System

1984: Superconducting Magnetic Energy System

1985: BHTP—A Unique Scintillation Compound

1986: Aurora Laser Beam Alignment System

1988: Optical Microrobot Single-Cell Manipulator/Analysis System; Nuclear Material Solution Assay System; 32-Stepper Motor Position Controller; Mobile Beryllium Monitor; HTMS Reference Electrode; Oriented, Highly Anisotropic Conducting Polymer; Photoinjector for RF Linac Accelerators; Lattice Gas Algorithm

1989: Fourier Transform Flow Cytometer; Noncontact Superconductor Screening; Conductive Lattices

1990: Broadband (ABB) Mw Absorption Spectrometer for Liquid Media; Coolahoop; Fast Agarose Gel Electrophoresis (FAGE); New Class of High-Temperature Structural Materials; Solid-State Nitrogen Dioxide Sensor; Universal Process for Fingerprint Detection; Upconversion Solid-State Laser

1991: Semi-Insulator Detector; Optical High-Acidity Detector; Resonant Ultrasonic Inspection (RUI); Single Molecule Detector

1992: Thermal Neutron Multiplicity Counter; Plastic Laser Dye Rods; Cryogenic Diamond Turning; Portable Laser Spark Surface Mass Analyzer (PLASSMA); Zeeman Refractive Index Detector; Animated Display of Inferred Tongue, Lip, and Jaw Movements During Speech

1993: Selenium-Based Reagents for the Evaluation of Chiral Molecules; Phase-Sensitive Flow Cytometry; Ultrafast Infrared Spectrometer; Mini Elastic Backscatter Lidar

1994: Ultrasensitive Ultrasonic Transducer; Telemetric Heat Stress Monitor; Optical Biopsy System; Lattice Boltzmann Permeameter; Directed Light Fabrication of Complex Metal Parts; Bartas Iris Identification

1995: The Indigo-830; ARS Chemical Fill Detector; Hydride-Dehydride Recycle Process; HIPPI-SONET Gateway; Microsensor for VOCs; Polymer Filtration System

1996: TRACER (Transportable Remote Analyzer for Characterization and Environmental Remediation); PLASMAX (Plasma Mechanical Cleaner for Silicon Wafers)

1997: Falcon: Breakthrough Software for Simulating Oil Reservoirs; Rapid Size Analysis of Individual DNA Fragments; ASR Detect—Diagnostic Method for Analyzing Degrading Concrete; Dry Wash; Plasma Source Ion Implantation for Enhancing Materials Surfaces; High Performance Storage

1998: Cyrax™—Portable, 3-D Laser-Mapping and Imaging System; Low-Smoke Pyrotechnics; SOLVE—Creating 3-D Pictures of Protein Molecules from X-Ray Diffraction Spots; Underground Radio

1999: Acoustic Stirling Heat Engine; Atmospheric Pressure Plasma Jet; CHEMIN: A Miniaturized X-Ray Diffraction and X-Ray Fluorescence Instrument; PREDICT—A New Approach to Process Development; Real-Time, Puncture-Detecting, Self-Healing Materials; REED-MD: A Computer Code for Predicting Dopant Density Profiles in Semiconductor Materials; The Sulfur Resistant Oxymitter 4000™

2000: ANDE: Advanced Nondestructive Evaluation System; Electroexploded Metal Nanoparticles

2001: Free-Space Quantum Cryptography; SCORR—Supercritical CO2 Resist Remover; Tandem-Configured Solid-State Optical Limiter

2002: GENIE: Evolving Feature-Extraction Algorithms for Image Analysis; HDF5: Hierarchical Data Format

2003: CARISS: Integrated Elemental and Compositional Analysis; BASIS: High-Confidence Biothreat Detection and Characterization; FIRETEC: A Physics-Based Wildfire Model; Flexible Superconducting Tape; FlashCT™; Green Destiny; PowerFactoRE: A Suite of Reliability Engineering Tools for Optimizing the Manufacturing Process; Super-Thermite Electric Matches

2004: Clustermatic; Confocal X-Ray Fluorescence Microscope; mpiBLAST: A High-Speed SoftwareCatalyst for Genetic Research; Plasma-Torch Production of Spherical Boron Nitride Particles; 10-Gigabit Ethernet Adapter: Speed Really Changes Everything

2005: CartaBlanca; MESA: Measuring Enzyme-Substrate Affinities; nanoFOAM: A Metal-NanofoamFabrication Technique; NESSUS

2006: ENABLE: Energetic Neutral Atom Beam Lithography/Epitaxy; Green Primaries: Enviro-Friendly Energetic Materials; MICHELLE: A Software Tool for Three-Dimensional Modeling of Charged-Particle-Beam Devices; PixelVizion: An NPU-Embedded Visualization Accelerator for Large Data Sets; Trident

Q: The Laboratory recently received two R&D 100 awards for technologies with significant commercial potential, bringing its total to 105 since 1978. How important is it that the Laboratory continues to develop technologies that can be moved into the commercial market, and what does the Lab's winning track record say about the quality of its research and technology?

Rich Young of Communication, Arts, and Services (IRM-CAS)

Hopefully, public opinion of the Lab can be improved upon knowing that the Lab is engaged in other endeavors besides nuclear weapons design.

Jack Yu of the Center for Nonlinear Studies (CNLS)

It's very important that the Lab continue to develop technologies that can be moved into the commercial market, because not only does it provide an alternative source of income, it also gives the public a sense of understanding of what's going on inside the Lab. Since most people are not aware of what happens "behind the scene," The Lab's winning track record indicates the high quality of research and technology and shows tremendous promise for the future of our nation.

Xiuling Nie of the Research Library (STBPO-RL)

I think it is very important. One reason is that we can get funds to support our research and continue to grow.

Walter Lysenko of Transport Applications (X-1-TA)

The fact that these awards provide good visibility for the Lab is a good thing, but a concern I have is that such work is only a small pat of the great work being done here and not necessarily representative of the other great work being done at the Lab.

Earl Vest of Deployed Shops (PF-DS)

I think it is very important that we continue to develop technology with commercial appeal. I know from the weapons side that there has been a lot of technology that has found its way to the commercial side. I think that is a testament to the people here that still are doing great work in spite of the difficulties and challenges in other areas.

Irma Holtkamp of the Research Library (STBPO-RL)

Yes, it is important for them to continue. Absolutely. As a research institution we are supposed to be at the forefront of technology research and development and these awards represent research areas where the Lab can contribute—research that helps businesses by creating spin-off technologies for commercialization. The Laboratory has and needs to continue to develop research facilities to do that. R&D is where the Lab has, can, and should excel.

Miriam Blake

Blake is Laboratory's new Research Library director

Miriam Blake is the new director of the Research Library. Blake has been serving as acting group leader since July 2006. She officially accepted the position in June of this year.

Blake has been working in or for libraries her entire career. "I have been very lucky in my career. I have been in an exciting field; information science is the core of the Internet and it's been great to have a part of it for so long," she said.

Blake began her career at the Texas Woman's University library in 1987. From there she moved to an international company, Geac Computers, where she developed a technical background in integrated library systems. "I feel like I understand libraries very thoroughly since I've worked in almost all areas of them, and by training library staff on how to use automated systems I've had to know very fully what it is libraries do," said Blake.

"I believe that I bring a lot of knowledge from the past but also a lot of enthusiasm for the future. I like thinking of new ways to do things and thrive on change," said Blake.

The Research Library, part of the Science and Technology Base Program Office (STB), recently was named "the best science research digital library in the world." Blake said she hopes to help preserve that recognition.

Blake has worked at the Laboratory for about 10 years, serving in the Research Library as a software developer and team leader. She earned a bachelor's degree in history from Texas Woman's University.

Cantwell appointed to Space Studies Board

Betsy Cantwell, acting division leader of the International, Space and Response (ISR) Division, recently was appointed as a member of the National Research Council's Space Studies Board.

Betsy Cantwell

Cantwell has been a Laboratory employee for two years. She earned a doctoral degree in mechanical engineering at the University of California, Berkeley.

The Space Studies Board serves as the focus of the interests and responsibilities in space research for the National Academies

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In Memoriam

Charlotte Laux

Laboratory retiree Charlotte Laux died May 4. She was 67.

Laux joined the Laboratory in 1974 in the former Personnel Department (PER). While at the Lab, she also worked in the former Design Engineering (WX) Division and retired in 1995 from the former Engineering Sciences and Applications (ESA) Division.

She is survived by daughter Holly Mechels of Los Alamos, Rene Davis of Phoenix, and Jennie Lovato of Florida; stepson Matt Laux of White Rock; her father W.G. Mabery of San Diego; sisters Cynthia Sedillo of San Diego and Jeannine Summers of Chimayo; and six grandchildren.

Bruce Erdal

Laboratory retiree Bruce Erdal died May 23. He was 67.

Erdal retired from the Laboratory in 2005 after a career spanning three decades. Erdal joined the Laboratory in September 1972 in the former Chemistry and Nuclear Chemistry (CNC) Division. He worked in numerous other organizations, including the former Isotope and Nuclear Chemistry (INC), Electronics and Instrumentation (E), Chemical Science and Technology (CST) and Risk Reduction and Environmental Stewardship (RRES) divisions. When he retired, Erdal was in the Environmental Protection (ENV) Division.

A graduate of Highland High School in Albuquerque, Erdal earned a bachelor's degree in chemistry from University of New Mexico and a master's degree in nuclear chemistry from Washington University in St. Louis, Missouri.

Gordon M. Smith

Laboratory retiree Gordon M. Smith died May 24. He was 76.

Gordon began working at the Laboratory in 1958 in the former GMX Division. He worked in the former TD Site, Engineering Equipment Surveillance System (ESS), and MSP and DRV, divisions, retiring in 1990 while in the former Space Science and Technology (SST) Division.

He received bachelor's and master's degrees in chemistry from Oklahoma A&M University and a doctorate from the University of Florida.

He is survived by his five children Leslie Fowler, Janet Vandergust, Scott Smith, Laura Smith, and Todd Smith; brothers Herb and Norris Smith; sister Carol Smith; thirteen grandchildren; and one great-grandchild.

July service anniversaries

5 years
Rita Abeyta, IST-APPS2
Jeffrey Bacon, P-25
Kevin Bailey, MSS-TA55FO
Douglas Bailey, ES-SE
Kenneth Baird III, N-1
Robert Briscoe Jr., TA55-OPS
Stephen Bruketta, CTN-2
Randy Burditt, ES-DE
Thomas Canfield, T-3
Mercedes Castelo, W-7
Rebecca Coel-Roback, ERSS-RS
Larry Coleman II, CTN-3
Glen Cordova, MSS-EWMFO
Duane Crapser, MQ-2
Sandra Cruz, C-CSE
Christina Davis, ADSMS
Kimberly Defriend, MST-7
Augusto Dionizio, WT-9
John Duran Jr., IST-IS13
Judith Eglin, PM-DO
Laurence Feldman, HPC-4
Paul Felsher, N-2
Ronald Hart, PMT-5
Phillip Hart, WT-5
Matthew Johnson, MST-6
Judith Kenney, QA-PQ
Brandon Lattimore, AET-6
Vernon Lawrence, HX-6
Haeok Lee, N-DO
Thomas Lienert, MST-6
Francisco Lopez, MQ-2
Frederick Lowe, HPC-1
Leonard Lujan, ADSMS
April Maestas, SEC-PPS1
Lauraine Maness, MQ-2
Raymundo Manquero, MSS-TRPM
Jesse Martinez, MST-6
William Massengale, CM-CMGRS
Ronald Mayhill, IST-IS12
Elizabeth Mendius, IRM-CAS
James Merhege Jr., WCM-1
Natalie Montoya, FME-WFO
Corey New, CTN-2
Thanh Nguyen, OCI-OFF
Paul Oldis, IAT-1
Robert Peterson, X-2-PC
Daniel Rivenbark, AET-5
Christine Rivera, HR-SYS
Silas Romero, WCM-1
Scott Runnels, X-3-LGRN
Joseph Sanchez, W-7
Andrew Sanchez Jr., SEC-PPS1
Charmian Schaller, IRM-CAS
Joseph Skarda, X-4-TAR
Carolyn Slaughter, IST-DO
Mark Smith, ISR-3
Brian Snyder, IST-APPS3
Arlan Swihart, W-10
Mark Thacker, ERSS-RS
William Thomas, SAFE-S3
Richard Trout, ES-DE
Christopher Valdez, CTN-2
Alida Van Etten, CS-PCS-4
Victoria Varela, CTN-5
Tomas Vigil, MSS-TRPM
Yan Xu, B-5
Brad Yoakam, HX-3
Qisu Zou, T-3

10 years
Jody Armijo, EWMO-AG
Michael Baker, N-2
Fedor Balakirev, MPA-NHMFL
Irene Beyerlein, T-3
Michael Blanton, HX-6
Susan Cummings, EFO-WETF
Craig Cunico, IAT-3
Gina Gallegos, CS-PCS-1
Amanda Garcia, CTN-2
Patrick Hochanadel, MST-6
Jenifer Hoffman, PM-DO
Zachary Huse, MQ-2
Sandra Lopez, SAFE-MCAS4
Allan Marcus, CTN-1
Marlene Martin, ADNHHO
Bruce Panowski, IST-APPS3
Rajesh Pawar, EES-6
Robert Putnam, PM-DO
John Rennie, PMT-3
Gabriel Roybal, ISR-2
Michelle Silva, N-4
John Thorp, CCS-DO
Walter Tuzel, WT-7
JohnVandenkieboom, X-2-AFS
Patricia Vardaro-Charles, ENV-RCRA

15 years
Thomas Burr, CCS-6
Todd Conklin, CT-DO
Robert Dingler, ISR-3
Alison Dorries, ERSS-DO
Donnette Ehler, IAT-1
Pamela Flores, CT-DTS
Joseph Garcia, W-9
Eugene Gavrilov, CTN-5
Gerald George, RP-1
Robert Gore, X-2-PC
Michael Inbody, AET-1
Eric McNamara, HX-3
Martin Price, PP-EM
Ruben Rangel, RP-3
Brian Ray, MSS-TRPM
Christopher Romero, AET-1
Alexander Sowa, ADSS
Thomas Tierney, P-22
Ronald Wieneke, PM-DO
Sarah Williams, ADE

20 years
Carl Cady, MST-8
Dale Dalmas, HX-6
William Eisele Jr., ERSS-GS
Steven Goldstein, C-NR
Thomas Granich, SEC-DSS9
Jerry Leyba, ASM-PM
William Louis III, P-DO
Stephen Mclin, ERSS-GS

25 years
Mable Amador, IRM-CAS
Kathy Bull, HR-WEAPONS
David Chastain, PP-DO
Jamie Gardner, EES-9
Thomas Gorman, X-4-NS1
Laverne Martinez, WCM-3
Julian Sandoval, ASM-PM
Elizabeth Saunders, B-5

30 years
Terrance Goldman, T-16
Jerry Martinez, IRM-RMMSO
Charlene Mchale, N-2
Arsenio Montaño, WT-5
M. Rose Montoya, W-DO
Gregory Swift, MPA-10
Gregg Woodfin, IST-IS12

35 years
William Krauser, X-2
Allen Schmiedicke, IST-APPS3

Cantwell …

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by providing information and advice on all aspects of space science and applications.

"This is an incredible honor; the Space Studies Board plays a vital role for national space science policy," said Cantwell.

The board oversees advisory studies and program assessments, facilitates international research coordination, and promotes communications on space science and science policy between the research community, the federal government, and the interested public.

Cantwell is one of 22 scientists from across the country serving on this board. Her appointment began July 1.

Hampel-Arias selected to attend ACS/DOE summer school

Zigfried Hampel-Arias of Nuclear and Radiochemistry (C-NR) is attending the 2007 American Chemical Society/Department of Energy Summer School in Nuclear and Radiochemistry through July 27 at Brookhaven National Laboratory in New York.

Out of the seventy nationwide applicants, only twenty-four were selected to attend the summer program.

The Fellowship program covers tuition, housing, travel, and all other costs. The summer school consists of both lectures and laboratory work with a special symposium on nuclear medicine. A junior majoring in chemical physics at Rice University, Hampel-Arias will receive unique undergraduate training and college credit.

Hampel-Arias has been working under mentor Donald Dry of Nuclear and Radiochemistry since the end of his junior year at Los Alamos High School. Hampel-Arias assists in the development of liquid scintillation counting protocols. For the group's radiochemistry team, Hampel-Arias helps with the incorporation of the elements gallium and zinc into the intricate sequential separation of 16 radioelements.

The program is hosted by the Undergraduate Fellowship of Nuclear Chemistry and Radiochemistry.

This month in history …

Month

1687—Sir Isaac Newton's *Principia Mathematica* is published.

1858—Fingerprints are first used as a means of identification by William Herschel, who later established a fingerprint register.

1865—The Salvation Army is founded.

1866—The metric system becomes a legal measurement system in the United States.

1881—Sioux Indian leader Sitting Bull, a fugitive since the Battle of the Little Big Horn, surrenders to federal troops.

1898—Theodore Roosevelt and his volunteer cavalry, the Rough Riders, storm San Juan Hill during the Spanish-American War.

1918—Baseball is declared a nonessential occupation and players are told by the Secretary of War to seek "employment to aid successful prosecution of the war or shoulder guns and fight."

1921—At the University of Toronto, Canadian scientists Frederick Banting and Charles Best successfully isolate insulin—a hormone they believe could prevent diabetes—for the first time.

1933—Karl Jansky discovers radio emissions from the Milky Way, which is the birth of radio astronomy.

1941—NBC airs first official television commercial.

1941—The British MAUD committee reports that an atomic bomb is feasible.

1945—The USS Indianapolis delivers atomic bomb components to Tinian Island for final assembly.

1946—Operation Crossroads begins with atomic bomb tests at Bikini Atoll.

1947—A rancher finds wreckage northeast of Roswell that some people point to as evidence of a visit to Earth by a UFO.

1948—AEC management orders the Los Alamos Times to discontinue publication, effective with the issue of July 29.

1955—Disneyland opens in Southern California.

1957—The International Atomic Energy Agency is established by the United Nations.

1958—President Dwight Eisenhower signs the National Aeronautics and Space Act, which created NASA.

1967—The Freedom of Information Act goes into effect.

1976—The International Space Hall of Fame is dedicated at Alamogordo.

1982—The National Flow Cytometry Resource is designated at the Laboratory by the National Institutes of Health and the DOE.

1989—The Manuel Lujan Jr. Neutron Scattering Center is dedicated at Technical Area 53.

1994—The Lab's Materials Science Laboratory is dedicated.

1997—The Laboratory conducts the Rebound subcritical experiment at the Nevada Test Site.

2001—At approximately 10 a.m. EDT is Earth aphelion; the planet Earth reaches that point in its orbit, aphelion, when it is the farthest from the sun, about 94,510,000 miles.

And this from the 1966 Atom: It will all be over this month. The last of the guests and the diners will cross the red-tiled threshold, somebody will lock the doors and The Lodge will end its 38 years as the center of a remarkable assortment of activity on the Pajarito Plateau. For future Hill visitors, the dark confines of the old hotel will be replaced by the sparkling efficiency of the new Los Alamos Inn.

The information in this column comes from several sources including the online History Channel, the Newsbulletin and its predecessors, the atomic archive.com, Echo Vitural Center, Science & Technology, Real History Archives, and Carey Sublette, "Chronology for the Origin of Atomic Weapons" from www.childrenofthemanhattanproject.org/ MP_Misc/ atomic_timeline_1.htm.

Jonathan Ventura of the weapons program directorate talks with Walter Koski in the seventh floor foyer of the National Security Sciences Building. Koski was looking at the recently-installed display of former Laboratory directors.

Manhattan Project pioneer visits Lab, recalls wartime work

by Erika Martinez

In 1944, Walter Koski came to the Lab with his wife, Helen, and their new baby girl to embark on one of the largest and most profound projects in American history: the invention of the atomic bomb. Little did Koski know it would be more than 60 years before the Manhattan Project pioneer would return, only to be amazed by the advances in science and technology since his days spent in Los Alamos.

"This experience has just been overwhelming and beyond imagination," said Koski.

The 93-year-old atomic-bomb scientist recently toured the Lab, traveling to the Dual Axis Radiographic Hydrodynamic Test Facility at Technical Area 15 and the Nicolas J. Metropolis Center for Modeling and Simulation. He also had a chance to meet with Director Michael Anastasio, who presented Koski with a *Science in the National Interest* book, which was given to Lab employees from the University of California last year.

Koski, who now lives in the Washington, D.C., area began working with explosives in the 1940s because World War II had begun and he felt he needed to contribute. At Los Alamos, Koski specialized in implosion research and was able to work with such brilliant minds as Seth Nedermeyer, who invented the implosion concept of fast assembly of fissile material to supercriticality; and George Kistiakowsky who designed the implosion bomb's explosive mechanisms and devised a method to detonate them. Koski also worked on flash photography of imploding cylinders and hemispheres to study symmetry and velocity of collapse.

"I worked on implosions when I was here and IBM machines were used. There was lots of manual work," Koski said. "Lots of wives were hired to work on computers and programming."

"There have been 'slight' changes," Koski joked. "I miss Los Alamos, but my wife doesn't."

"He was absolutely amazed by the changes made over the years but was pleased that the technical staff remains top notch," said Jonathan Ventura, office director for Los Alamos's Weapons Program, about Koski's visit. Ventura escorted Koski through the Lab and was able to spend some one-on-one time with the pioneer as he explored all the facilities.

Koski said he remembered many good days at the Lab and has been able to keep up with all the advances in science. But one of the fondest memories Koski has of Los Alamos, was spending time with his daughter while on frequent trips to nearby mesas to watch wild turkeys.

Still sharp as ever, Koski admitted that science was still a part of his daily life, even in retirement. "I still read and study chemistry and physics," he said. "I'm also able to take care of my wife, now that I'm retired."

Koski was born in Philadelphia in 1913. He studied nuclear chemistry and received his master's degree from Johns Hopkins. He worked for the Hercules Powder Company before joining the Lab in 1944. Koski was at Los Alamos for almost four years.

Laboratory Director Michael Anastasio shares a laugh with Manhattan Project pioneer Walter Koski during a recent visit to Los Alamos. Anastasio had earlier presented Koski with a copy of the University of California book *Science in the National Interest: Photographs Celebrating Six Decades of Excellence.*

Photos by LeRoy N. Sanchez, Records Management, Media Services and Operations

New exhibit opens at the museum

July 16 marked the 62nd anniversary of the Trinity Test. To commemorate this anniversary, the Bradbury Science Museum this week opened its new exhibit, "They Changed the World: The People of Project Y at Los Alamos, 1943-1945."

The new exhibit features a collection of documentary portraits by noted Santa Fe photographer aj Melnick, who set out to find and photograph as many local people as she could who had worked on "The Hill" during the war years.

The exhibit will run through January 8, 2008.

For additional information, call the museum at 7-4444.