Los Alamos NATIONAL LABORATORY EST.1943

# NewsLetter

Week of June 19, 2006 Vol. 7, No. 13

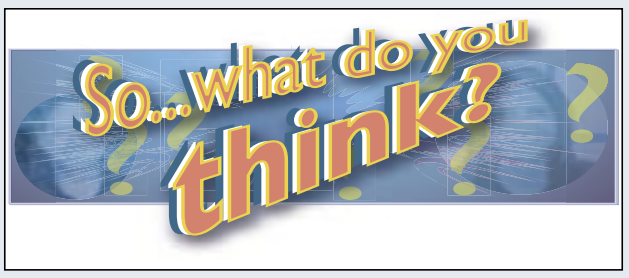
## Inside this issue ...












The Laboratory routinely hires more than 1,000 students during the summer, and most of this year's summer students already are on the job. What do you think is the most challenging thing an individual faces when mentoring a student at the Lab? Learn what your co-workers had to say on Page 6.

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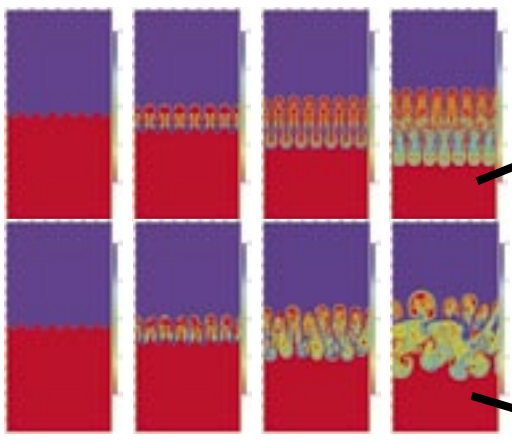
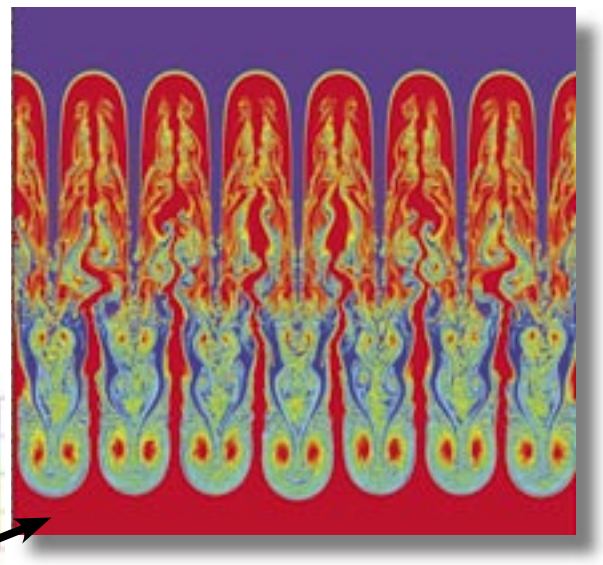
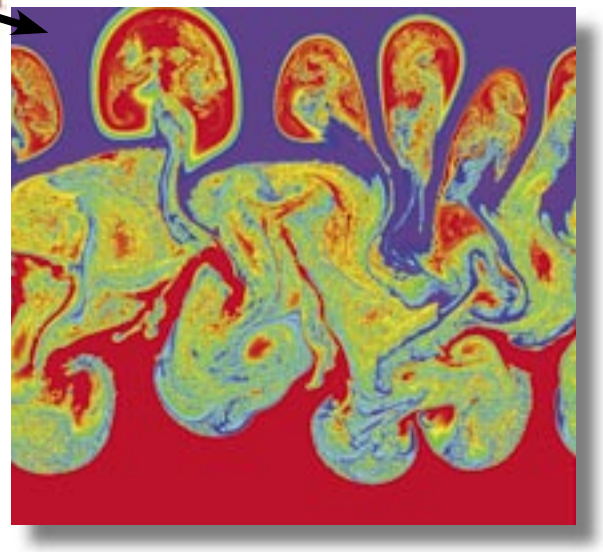
# Microscopic features affect macroscopic motions





*Two dimension simulation of single-mode Rayleigh Taylor instability and turbulent transition over time. Initial interface between the two fluids (above) without small-scale fluctuations and (below) with small-scale fluctuations.*



## *The devil is in the details*

*by Ed Vigil*

Noted British mathematician, logician and philosopher Alfred North Whitehead is quoted as saying, "We think in generalities, but we live in detail." By including details, Laboratory staff member Ray Ristorcelli and graduate research assistant Nathan Hjelm of Computational Analysis and Simulation (X-3-SVCG) are demonstrating that small-scale features have a large effect on large scale fluid motions.

Using Laboratory supercomputers, Hjelm solves the equations describing the Rayleigh-Taylor instability and transition to turbulence. In this Rayleigh-Taylor flow, a heavy fluid lies over a light fluid initially separated by a sinusoidal interface [the points at which the heavy liquid displaces the lighter liquid] with and without small-scale noise. Turbulence is generated when the heavy fluid descends into the lighter converting its potential energy into the motion of the fluid. By employing computationally intensive fine grids to solve the equations that the fluids obey, the effects of the small-scale features on the flows' evolution become apparent, Ristorcelli explained.

The practical applications for the simulations are in an area of fluid dynamics that seeks to predict fine scale turbulence and its effects on the large scale process of the mixing without calculating the fine-scale motions.

"These models play an important role in predicting the mixing of vastly different density fluids, such as hydrogen and air or in multi-phase problems like boiling of water," said Ristorcelli.

"Using the supercomputer, we can measure some things that you can't measure in real life, because we don't have the probes to do so in several situations of interest," said Ristorcelli. "We can, however, solve these problems on a computer using as many grid points as necessary to resolve the smallest scale features.

"What the simulations show," Ristorcelli continued, "is that if you don't resolve all scales of the physical problem, as you might be tempted to do when you have finite computational resources, you can get a completely different [fluid] flow. While we have demonstrated this with a model two-dimensional calculation, it also is true for the real 3-D problem. Moreover, the initial noise adds realism to the simulations; there is always noise in every physical problem."

# For Your Safety


## Personal protective equipment

### *Equip yourself for safety — from head to toe*

• Give safety a head start. If you need a hard hat, make sure it fits right and that the suspension is adjusted properly.

• Ask a safety supervisor or industrial hygienist to recommend the right kind of eye protection for the job. Be sure to take into account if you wear prescription glasses or contact lenses.

• Protect hearing with ear plugs or ear muffs. And try to reduce the amount of time you're exposed to noise.

• If using chemicals, cleaning solvents, etc., make sure to wear gloves and protective clothing that resist chemicals.

• Always protect hands from injury. Take off rings, bracelets and watches before starting work. And use gloves that are appropriate to the work being performed.

• If using respiratory protection, never use a respirator that doesn't fit securely, has become clogged or damaged, or one through which you can smell contaminants.

• Full-body protection may be necessary against hazardous materials, sparks, radiation and extremes of temperature.

• Wear the correct safety footwear for the work. Have it fitted by an expert so it fits right and feels comfortable. The ANSI-Z41 label inside means the footwear meets recognized safety standards.

• Remember: PPE only works if it is worn. Put it on, leave it on and take care of it.

Los Alamos NewsLetter

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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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## *Out and about …*

***Laboratory Director Michael Anastasio, along with Deputy Laboratory Director John Mitchell, visit several Laboratory organizations during his first day on the job. Shown here are some moments from the visits.*** *Photos by LeRoy N. Sanchez*

## Los Alamos National Laboratory management team

### Director's Office

• ***Michael Anastasio, director***

• ***John Mitchell, deputy director***

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• Science, Technology and Engineering, ***Terry Wallace***

• Weapons Program, ***Glenn Mara***

• Operations, ***Jan Van Prooyen***

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• Threat Reduction, ***Doug Beason***

• Weapons Engineering, ***Bret Knapp***

• Weapons Physics, ***Charles McMillan***

# Conference celebrates 50 years since discovery of neutrino

*Above: Laboratory Chief Scientist Tom Bowles talks with Nobel Laureate Jack Steinberger, left, at the Neutrino 2006 Conference in Santa Fe. Steinberger received the Nobel Prize in physics in 1988 with Melvin Schwartz and Leon Lederman for the development of a high-energy neutrino beam, which led to the discovery of the muonic neutrino. Steinberger talked about the discovery of the second and third neutrino during the opening day of the conference.*

*Top right: Laboratory Senior Fellow Emeritus and Los Alamos Medal recipient Louis Rosen presents a tribute to the late Hans Bethe during the opening day of the Neutrino 2006 Conference in Santa Fe. Rosen, who is now a Laboratory affiliate at the Los Alamos Neutron Science Center (LANSCE), first came to Los Alamos during its early Manhattan Project years and was instrumental in the successful development of the Los Alamos Meson Physics Facility, now LANSCE. Bethe, who died in March 2005, also was a Los Alamos Medal recipient and received the Nobel Prize for physics in 1967 for his groundbreaking work on the theory of energy production in stars.*

*Right: Rosen talks with Laboratory Director Mike Anastasio at the Neutrino 2006 Conference in the Lensic Performing Arts Center in Santa Fe. The conference, which celebrated the 50th anniversary of the discovery of the neutrino, featured talks, breakout sessions, poster sessions and public lectures covering the latest developments in neutrino physics, astrophysics and related topics. Anastasio and Laboratory Chief Scientist Tom Bowles gave opening remarks, and seven Laboratory technical staff members spoke at the conference. The neutrino conference is held every other year at locations around the world.* Photos by LeRoy N. Sanchez

# *Increased traffic creates safety concerns on NM 30*

*by Erik Eakins*

New Mexico 30 is a two-lane gauntlet intersecting NM 502 on its southern end and the city of Española to the north. With Santa Clara Pueblo opening a convenience store at the Puye Cliffs intersection on NM 30, the pueblo is urging Lab employees and other motorists to slow down and be aware of increased traffic in the area of the store.

Reader's Digest named the eight-mile stretch running through San Ildefonso and Santa Clara pueblos as one of the country's most dangerous roads. On NM 30 between 2002 and 2004 there were 100 crashes resulting in 71 injuries and two fatalities. Sixty-eight of the crashes and 51 of the injuries were within one-mile of Española, according to state statistics, but actual numbers may be higher because some of this data may not include tribal law enforcement data.

"We all have to work together to make the highways safer," said Santa Clara Gov. Joseph "Mikey" Chavarria, noting that accidents happen when people rush.

The New Mexico Department of Transportation has issued permits to Santa Clara Pueblo to make safety improvements to the intersection, said Karyn Lujan of the state road agency. Calvin Tafoya, chief executive officer of the Santa Clara Construction Corp., said changes to the intersection include installing a traffic light and widening the road to four lanes by adding a turning lane in both directions. Construction at the Puye intersection is expected to conclude by the end of June.

The convenience store has opened, while construction on NM 30 continues.

Speeding traffic makes it difficult to merge from the pueblos onto the highway and increases the chance of an accident. "Slow down" are the two words San Ildefonso Governor Dale Martinez has for drivers who use NM 30 and NM 502.

NM 30 currently is under a corridor study for the next 18 months, said Tafoya. Santa Clara Pueblo and the New Mexico Department of Transportation are working together to assess the highway to determine what redesigns are needed to enhance safety on the road.

# As lightning season approaches, be aware and take precautions

*by Kathy Delucas*

Lightning is one of the most under-rated severe weather hazards, according to the National Weather Service. In the United States every year, lightning kills more people than hurricanes or tornadoes.

One ground lightning strike can heat its path five times hotter than the surface of the sun and generates between 100 million and 1 billion volts of electricity.

Seven employees were struck by lightning within the last 15 years on Laboratory property: one person was on a telephone, one employee was on a crane, two people were inside a small building that was struck by lightning and three bicyclists were struck by lightning while standing under a tree.

The Laboratory has a lightning stroke counter at Technical Area 6 that responds to cloud-to-cloud or cloud-to-ground strokes within a 30-mile radius depending on atmospheric conditions. A lightning flash may contain between one and 30 strokes with an average of four strokes per flash. The stroke counter measures, on average, more than 25,000 lightning strokes per year, 97 percent of which occur between May and September. Eighty to 90 percent of summertime lightning activity occurs between noon and 9 p.m.

When the threat of thunderstorms develops, the following precautions should be taken, according to the National Weather Service:

• If your hair stands on end or you feel a tingling sensation, lightning may be about to strike. If no shelter is available squat down with feet together and place hands over ears to minimize hearing damage from thunder. This also reduces your chances of being struck or becoming a conductor for nearby lightning strikes.

• Remember the "30/30" rule. If lightning is sighted and its accompanying thunder arrives in less than 30 seconds, the lightning is within 6 miles and shelter should be taken. Remain in that shelter for 30 minutes after the last clap of thunder.

• Avoid projecting above the surrounding terrain as you would if standing in an open field or on a mountain top.

• Stay away from open water.

• If indoors, avoid water and stay away from doors and windows. Don't use telephones with cords and take off headsets. If possible, turn off appliances.

• Turn off computers, power tools and televisions because an exterior lightning strike of electric or telephone lines can induce shocks to indoor equipment.

• Stay off motorcycles and bicycles, tractors and other metal farm or construction equipment.

• Put down golf clubs and take shelter. Metal-spiked golf shoes increase the probability of being struck.

• Don't stand under natural lightning rods such as tall, isolated trees.

• Avoid taking shelter in small structures that are isolated in an open area.

• If in a forest, seek shelter in a low area under a thick growth of small trees; if in an open area, seek a low place such as a ravine or valley but stay alert for possible flash flooding.

Laboratory employees and subcontract personnel who work outdoors should be especially alert to the possibility of being struck by lightning. Heavy equipment vehicles and cranes serve as grounding paths for lightning because of their metal construction and girth.

Ninety percent of lightning victims survive the lightning strike. Individuals struck by lightning do not carry a charge, and it is safe to touch them to provide medical treatment. Providing first aid, even though an individual looks dead, may save a life. This would involve cardiopulmonary resuscitation, because the lightning may cause an individual's heart and lungs to stop functioning.

# Moving into the National Security Sciences Building

***Sylvia Quintana of the Office of Science (SPO-OS) stands among boxes of files, supplies and other items in her new seventh floor office of the National Security Sciences Building at Technical Area 3. The Office of Science previously was located on the west wing of the first floor of the Administration Building. The NSSB was dedicated in May and personnel have been moving into the $97 million facility. The 275,000-square foot National Security Sciences Building will house 700 staff members and includes a 600-seat auditorium and lecture hall and a 400-space parking garage, east of the Otowi Building.***
*Photo by LeRoy N. Sanchez*

## PATENT AWARDS

*Editor's note: Some of the individuals listed below are no longer employed at the Laboratory but were at the time they applied for the patent.*

**Noninvasive characterization of a flowing multiphase fluid using ultrasonic interferometry**
Patent No. 6,959,601, issued Nov. 1, 2005
**Dipen Sinha** of Electron and Electrochemical Materials and Devices (MPA-EEMD).

**Durable electro-optic devices comprising ionic liquids**
Patent No. 6,961,168, issued Nov. 1, 2005
**Anthony Burrell**, **Benjamin Warner** and **Thomas McCleskey** of Materials Chemistry (MPA-MC).

**Methods of conditioning direct methanol fuel cells**
Patent No. 6,962,760, issued Nov. 8, 2005
**Cynthia Rice**, **Xiaoming Ren** and **Shimshon Gottesfeld**, formerly of the Laboratory.

**Method for detecting biological agents**
Patent No. 6,979,543, issued Dec. 27, 2005
**Liaohai Chen of Hydrology, Geochemistry and Geology (EES-HGG)**, **Hsing-Lin Wang** of Physical Chemistry and Applied Spectroscopy (CHEM-PCAS), **Duncan McBranch** of Technology Transfer (TT) and **David Whitten**, formerly of the Laboratory.

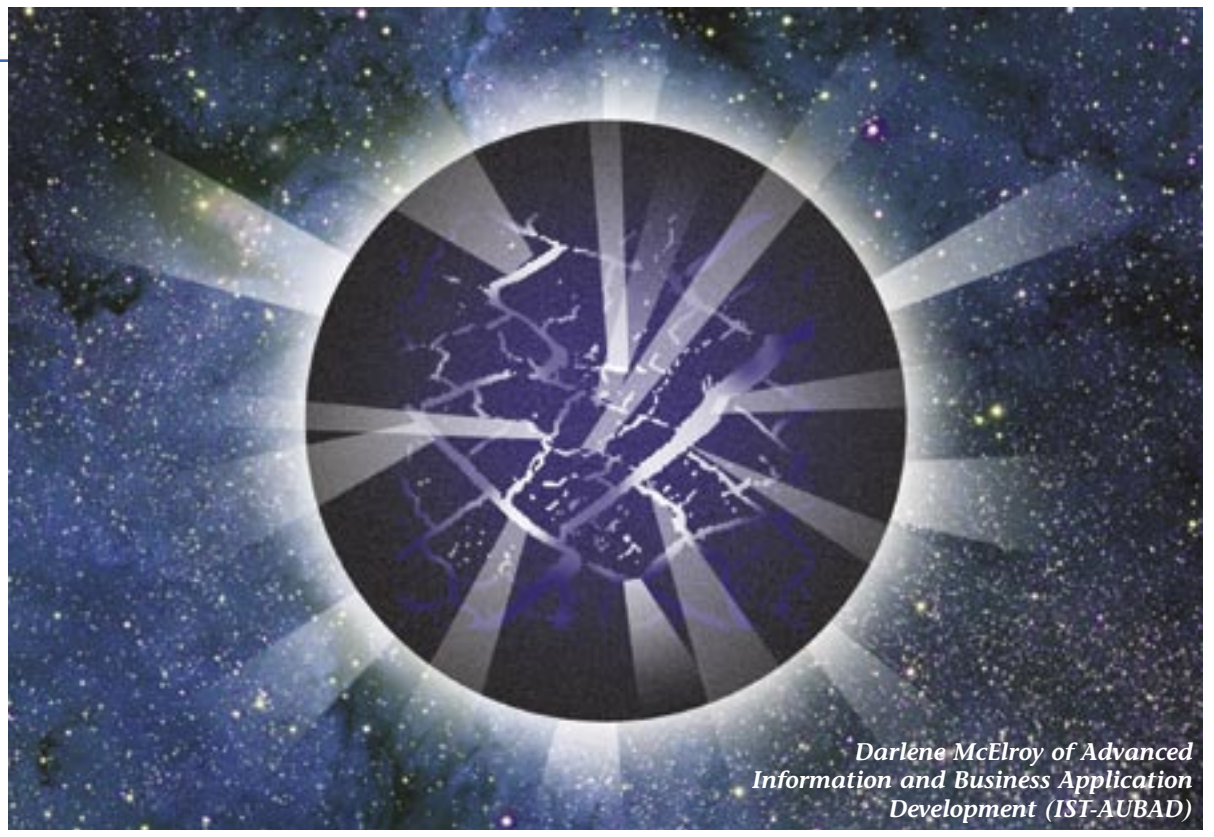
**Fuel cell stack with passive air supply**
Patent No. 6,986,961, issued Jan. 17
**Xiaoming Ren** and **Shimson Gottesfeld**, formerly of the Laboratory.

**Buffered co-scheduling for parallel programming and enhanced fault tolerance**
Patent No. 6,993,764, issued Jan. 31
**Wu-Chun Feng** of Advanced Nuclear Technology (N-ANT) and **Fabrizio Petrini**, formerly of the Laboratory.

**Multilayer composites and manufacture of same**
Patent No. 6,994,775, issued Feb. 7
**Terry Holesinger** of Metallurgy (MST-6) and **Quanxi Jia** of the Superconductivity Technoloy Center (MPA-STC).

**Cross-linked polybenzimidazole membrane for gas separation**
Patent No. 6,997,971, issued Feb. 14
**Jennifer Young** of Navy-2 (X-2-N2), **Gregory Long** of Actinide and Fuel Cycle Technology (PO-AFCT) and **Brent Espinoza** of Polymers and Coatings (MST-PC).

**Method for producing carbon nanotubes**
Patent No. 6,998,103, issued Feb. 14
**Jonathan Phillips** of Polymers and Coatings (MST-PC), **William Perry** of Energetic Materials Science (DMS-EMS) and **Chun Ku Chen** of Penn State University.



*Darlene McElroy of Advanced Information and Business Application Development (IST-AUBAD)*

# Scientists predict pulsar starquakes

*by Kevin N. Roark*

Scientists have discovered how to predict earthquake-like events in pulsars, the dense remains of exploded stars. These are violent episodes that likely crack a pulsar's dense crust and momentarily increase its spin rate.

John Middleditch of Modeling, Algorithms and Information (CCS-3) led the discovery team and presented findings at the American Astronomical Society Meeting earlier this month in Calgary.

Middleditch and his team have discovered that for one particular pulsar, named PSR J0537-6910, the time until the next quake is proportional to the size of the last quake. Using this simple formula, the scientists have been able to aim NASA's Rossi X-ray Timing Explorer at the pulsar a few days before a quake to watch the event unfold.

Using the Rossi Explorer, the team has tracked about 20 "starquakes" in this pulsar over the past eight years and uncovered a remarkably simple, predictive pattern.

"By monitoring the pulsar spin rate and changes in the spin, we can pin down a starquake event to within a couple of days," said Middleditch. "These and other details have helped to simplify what has, until now, appeared to be a bewildering assemblage of facts about starquakes in pulsars. If only predicting earthquakes were this straightforward."

Once several times more massive than our sun, a pulsar contains about a sun's worth of mass compacted in a sphere only about 20 miles across. A pulsar is so dense that a teaspoon of its material would weigh two billion tons on Earth. The pulsar is so named because from our perspective it pulses with radiation from its two magnetic poles as it spins, sending two lighthouse-like beams through space.

***A pulsar is so dense that a teaspoon of its material would weigh two billion tons on Earth.***

PSR J0537-6910 is located in a 4,000-year old supernova remnant near the Milky Way galaxy, about 170,000 light years from Earth, visible in the Southern Hemisphere.

The pulsar is known for its frequent quakes, which scientists call glitches. Pulsars are born spinning rapidly, but gradually slow down. During a glitch, the spin rate increases slightly. PSR J0537-6910 spins at a rate of about 62 times per second, or 62 hertz. During a glitch, this pulsar's spin jumps up as much as one cycle every seven hours, a greater gain than what is seen in any other pulsar. Then the pulsar proceeds to slow down again.

After about 10 glitches since monitoring began in 1999, the scientists saw a pattern. The amount of increase in spin with each glitch could be translated directly into the number of days until the next glitch. Larger glitches meant a longer wait until the next one.

The predictive nature of these glitches firms up the leading theory on their cause. Pulsars have a solid crust, but are permeated with a liquid "neutron superfluid." Much of the crust's own superfluid does not slow with the pulsar, but when the difference in rotation rates exceeds a certain threshold, a large fraction of the excess can be "dumped" into the solid crust through massive cracking, making the pulsar spin faster.

The major glitch is always preceded by small ones, representing local dumps of rotation due to localized, small cracking. "A month ago we were watching the pulsar get the 'jitters' before the big quake," Middleditch said. "Then, by May 7, 2006 the big one had happened. We can only predict one glitch at a time."

Middleditch's colleagues include Frank Marshall and Will Zhang of NASA's Goddard Space Flight Center in Greenbelt, Md.; Eric Gotthelf of Columbia University in New York; and Daniel Wang of the University of Massachusetts, Amherst.

Middleditch noted that his team also found evidence the pulsar's magnetic pole is moving a few feet every year. Although a known feature on Earth, this is the first strong case for magnetic pole migration on a pulsar.

For information, a NASA animation and other art, go to *http://www.c3.lanl.gov/~jon* or *http://www.nasa.gov/vision/universe/watchtheskies/swift_nsu_0205.html* online.


**Q: The Laboratory routinely hires more than 1,000 students during the summer, and most of this year's summer students already are on the job. What do you think is the most challenging thing an individual faces when mentoring a student at the Laboratory?**

**Garrett Kenyon of Applied Modern Physics (PHY-AMP)**

The most challenging aspect of being a mentor is dealing with situations in which a student becomes frustrated and effectively gives up. Scientific projects often fail to yield conclusive results or come to a satisfying resolution. It's important to encourage students to keep after their mentors, especially when progress has bogged down, to make sure the mentor is fully aware of the difficulties being encountered. My chief advice to students, therefore, is to get in your mentor's face and stay there! All mentors have freely agreed to take on a student. Students need to make their mentors honor that agreement.

**Edith Madrid of Space and Remote Sensing (ISR-SRS)**

First of all, as administrative assistant, my experience has been having to find students office space, purchasing equipment required to do their jobs, finding time to mentor not only my own student but having to take care of all students within the group. Mentoring is as challenging as it is rewarding. Students bring such a high degree of satisfaction. Just being able to see them grow and become experts in their fields makes my job worth it.

**Gordon Keating EES-EGSA**

For off-site students who only come to the Lab now and then, it's challenging to make sure they remain current with training and other regulations.

**Bryan Pivovar of Electron and Electrochemical Materials and Devices (MPA-EEMD)**

[The most challenging thing is] making sure you dedicate enough time to ensure that the student does safe, productive work, in an enjoyable work environment.

**Valerie Lopez of the Physics (PHY) Division**

The most challenging part about mentoring students is ensuring that each one enjoys his/her assignment, feels that he/she is valuable to the Laboratory, and that they are contributing their skills to the organization to which they are assigned.



# Vecinos award winners announced

*by Steve Sandoval*

**Sebastien Dartevelle** of Geophysics (EES-GEO), **John Dodgion II** of Audits (EA-AUDITS) and Laboratory affiliate **Charles "Chick" Keller** are recipients of the Vecinos award for outstanding volunteer work. Coordinated by the Community Programs Office (CPO) and the Los Alamos National Laboratory Foundation, the Vecinos program recognizes outstanding volunteers.

Vecinos, which is Spanish for neighbor, aims to recognize those Lab employees, retirees and subcontract personnel who are outstanding volunteers while also raising awareness about the importance of volunteer service.

The nonprofit organization that is the recipient of the employees' volunteer service will receive a $1,000 grant in honor of the employees' volunteer service, while the employee will receive a certificate, explained Debbi Wersonick of CPO.

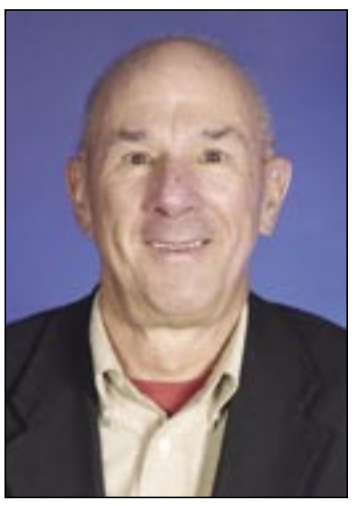
## *Sebastien Dartevelle*

Dartevelle was nominated for the award by Janice Quinn, executive director of the Court Appointed Special Advocates program. CASA helps to meet the needs of abused and neglected children in the state.

"Sebastien has been an extraordinary volunteer from the first day he contacted us," said Quinn. "Without question, Sebastien Dartevelle possesses unique and varied talents, a strong sense of dedication, seemingly boundless energy and passion for our mission and the children we serve, and is an individual of high moral character," Quinn wrote.

"He swiftly earned respect from the Children's Court judge and established a reputation as a strong-willed, convincing, efficient and effective advocate for children among the attorneys and social workers involved in cases," Quinn said.

She noted that Dartevelle also is a member of the organization's speaker's bureau, actively solicits speaking engagements and has volunteered to work information booths and exhibits for the organization at public events.



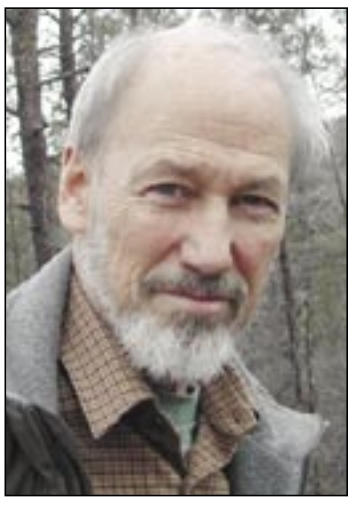
## *John Dodgion II*

Dodgion was nominated for the award by Julia Bergen, executive director of Fine Arts for Children and Teens Inc., a Santa Fe-based arts education organization that develops innovative arts learning programs for at-risk youths. The program operates in several school districts in Northern New Mexico.

The program serves at-risk youths in the community who might not otherwise have access to arts education. "FACT programs increase self-esteem, improve social and language skills, promote creative thinking and bring joy through self expression," said Bergen.

According to Bergen, Dodgion currently serves as president of Fine Arts for Children and Teens Inc. and has been on the organization's board of directors five years. In part through Dodgion's efforts, FACT now serves more than 3,000 youths in several Northern New Mexico communities. He has developed partnerships with other organizations to bring arts workshops into schools. Workshops now are being offered by FACT for incarcerated youths at the Santa Fe County Detention Center's Youth Development and Arc programs; and homeless children through the Santa Fe Public Schools' Adelante program, Bergen added.

Dodgion also set up a database to track donations to the program and helped to redesign Fine Arts for Children and Teens Inc.'s Web page. "John also created an annual report to better communicate with the public about who we are and what we are doing. Furthermore, John oversaw a strategic plan review process to ensure that FACT grows in accordance with its mission and goals," Bergen wrote.



## *Charles 'Chick' Keller*

Keller helped create the Pajarito Environmental Education Center (PEEC) in the late 1980s, according to Randall Ryti, president of PEEC. Keller established some of the organization's first education programs, was instrumental in transforming an abandoned building into a space where PEEC conducts hands-on demonstrations and exhibits and then successfully negotiated a three-year lease for the organization with the building's owners, Ryti wrote in nominating Keller.

Keller also developed PEEC's membership base, acquired pressed plant collections from the U.S. Forest Service and the Laboratory and created the Jemez Mountain Herbarium.

"He has taught high school students to curate the collection and helped [University of New Mexico, Los Alamos] students write a wildflower collection brochure," wrote Ryti. Keller also replaced a lawn at PEEC's building with water conserving xeriscape landscape. "As a result, PEEC has become an important resource to the [Los Alamos County] Department of Public Utilities in its education project to reduce water consumption," said Ryti.

"Chick is molded in the likeness of the great naturalists of history and is respected for his vast knowledge," Ryti wrote. "Yet the quality that sets him apart is the importance that he gives to helping other people, whether a child or an adult, connect with the natural world."

For more information about the Vecinos program, see the March 27 Daily Newsbulletin at *http://www.lanl.gov/news/index.php?fuseaction=nb.story&story_id=8124* online.

# June employee service anniversaries

**35 years**
Esther Duran, CFO-2
L. Thomas Gonzales, ESA-WOI
Henry Olivas, DX-3
Roland Salazar, NMT-16
James Sanchez, HSR-1

**30 years**
Shirley Bustos, ENV-ECO
Marcella Cromeenes, CFO-1
Frank Gonzales, HR-CAS
Jerome Kolar, ISR-4
Loyda Martinez, CCN-2
Marcella Mathieson, SUP-3
Joseph Raybun, LANSCE-MDE
Gloria Romero, CFO-1
Cheryl Sanchez, DX-2
Cecilia Sandoval, NMT-16
Jesse Vigil, SUP-2
Marcus Voltin Jr., HSR-12
Roger Volz, CCN-2

**25 years**
Rudy Abeyta, FM-NMT
Ernesto Archuleta EES-DO
Joachim Birn, ISR-1
Robert Brewer, IM-9
Richard Castro, MSM-DO
Kerry Coffelt, SUP-2
Roderick Day, C-AAC
Donald Dreesen, EES-11
Kenneth Hargis, ENV-DO
Barbara Herrera, N-3
Joyce Herrera, S-9
Donathan Krier, EES-6
Gene Maes, MSM-2
Angela Martinez, CFO-3
Benny Martinez, N-4
Johnny Montoya, NMT-16
Bart Ortiz, FM-NMT
Stevan Pattillo, MST-7
Richard Picard, D-1
Michele Poling, PM-DS
Thomas Starke, ENV-LWD
Andy Steck, LANSCE-OPS
Andrea Taylor, CER-30
Glenn Thornton, SR-OPS
Patricia Trupp-Hampton, NMT-4
Mary Ann Vigil, ADWP
Edwin Vigil, CER-20
Velda Volz, CCN-7
Richard Wallace, N-4
Stephen Wender, LANSCE-NS

**20 years**
Joysree Aubrey, P-21
Bill Bennett, ESA-TSE
Gary Cooper, LANSCE-LC
Darryl Garcia, NWIS-OS
Leroy Gonzales, SUP-10
Anthony Grieggs, ENV-SWRC
Russell Gritzo, C-INC
Michele Gubernatis, C-AAC
George Hagedorn, MSM-2
Marie Homan, HR-SC
James Knudson, LANSCE-OPS
Charles Lee, IM-3
Robert Manzanares, N-2
Allyn Pratt, N-2
Laurie Quon, IM-1
Donald Siebe, D-5
James Sturrock, LANSCE-OPS
Judith Valerio, MST-11
Michael Weaver, ADTR-TRO

**15 years**
David Bell, LANSCE-OPS
M. Carolyn Briles, N-3
Eric Brosha, MST-11
Jeffrey Bull, HR-ADA-TS
William Buttler, P-23
Alverton Elliott, PAAA
Christen Frankle, ISR-1
Amy Galbraith, ISR-3
Richard Luce, STB-RL
Theodore Martinez, ESA-EDE
Paul Mombourquette, MST-7
Filippo Neri, LANSCE-ABS
Donna Richardson, ADTR-TRO
Martin Schauer, P-23
Marianne Wilkerson, C-ADI
Karen Young, LANSCE-RFE

**10 years**
Randy Balice, ENV-ECO
Michael Collier, ESA-WDS
Susan Coulter, CCN-7
Jason Cox, SR-OPS
Crystal Espinoza, FM-MSE
Leslie Hansen, ENV-ECO
James Howse, CCS-3
Elizabeth Keating, EES-6
Alex Lacerda, MST-NHMFL
Anthony Ladino, POL
Kathy Lao, MST-6
Claudine Martinez, CFO-1
Christopher Mcconaha, NMT-3
Christopher Mclean, C-PCS
Jessica Ortiz, CFO-3
Robert Parker, N-1
Donivan Porterfield, C-AAC
Sara Sandoval, MST-7
Erik Shores, X-1-SEC4
Alice Slemmons, C-AAC
Hans Snyder, N-2
Torsten Staab, ESA-AET
Yi-Ming Wang, X-2-SEC1
Clare Webber, CFO-3

**5 years**
Myles Adams, X-2
Joseph Aguilar, ENV-ECO
David Allen, ESA-WR
Gerald Alletzhauser, NMT-11
Cory Andrews, DX-6
Felicia Archuleta, S-2
Marcus Bailon, NMT-10
Kathy Barela, ESA-WR
Steven Barks, ESA-EDE
Mikhail Blinov, T-10
Pauline Borrego, ISR-RD
Douglas Bowen, HSR-6
Gregory Bowers, X-2
Edward Brown, CCN-5
Lowell Brown, X-3-SEC7
Dale Carmichael, SUP-9
M. Isabel Garcia, ENG-DECS
Timothy Davenport, X-3-SEC1
Nancy David, ISR-2
Brenda Dingus, P-23
Damian Eads, ISR-2
Kevin Esquibel, DX-6
Joyce Foropoulos, NMT-DO
Grant Fox, ISR-5
Sean French, ENV-ECR
Iris Gallegos, NMT-12
Jacquelyne Gallegos, HSR-5
Benjamin Greenbaum, T-8
Gurinder Grewal, ENG-CE
Robert Hackenberg, MST-6
Asa Hopkins, T-8
Jason Hick, CCN-7
Jeffrey Hylok, ESA-WR
Bonnie Koch, D-2
Brian Lain, EES-DO
Thomas Leitner, T-10
David Lichliter, PM-4
Lorrie Bonds Lopez, ENV-DO
Jenifer Lopez, CCN-3
Isaac Maestas, CFO-3
Christopher Martinez, C-ADI
Jennifer Martinez, N-2
Julie Maze, ENV-ECR
David Mcdonald, T-10
Kim Meadows, C-CSE
Audrey Medina, HSR-5
Melanie Medina, CFO-3
Benjamin Migliori, T-11
Dima Mozyrsky, T-4
Matthew Newell, N-1
Stephen Obrey, C-ADI
Joaquin Ortega, ESA-WOI
Crystal Salazar, SUP-3
Jose Sanchez, CFO-1
Nathan Schanfein, N-1
William Schwettmann, PM-4
Virginia Seamster, EES-2
Elizabeth Selcow-Stein, X-3-SEC4
Daniel Sheppard, X-1-SEC4
Amanda Smith, FM-MSE
Jason Smith, ISR-5
Andrea Spearing, CCN-12
Brian Sweeney, NMT-16
Angelic Trujillo, CFO-3
Ashley Trujillo, DX-3
Rhonda Trujillo, ENV-ECO
Sonia Trujillo, C-ADI
Angela Valdez, IM-3
Elisha Valdez, SUP-14
Tabitha Valdez, MSM-TIS
Michelle Vigil, ESA-ESA
Bradley Wescott, X-4-SEC3
Susan West, LANSCE-MDE
Stephen Willson, NMT-16
Michelle Winters, CCN-3
Christopher Wipf, P-21
Travis Woods, B-2
Hasani Wooten, D-2

## This month in history ...

*June*

**323 BC** — Alexander the Great dies at Babylon.

**1633** — Galilei Galileo forced by Inquisition to abjure theories of Copernicus.

**1777** — John Adams introduces a resolution before Congress mandating a United States flag, stating, "... that the flag of the thirteen United States shall be thirteen stripes, alternate red and white; that the union be thirteen stars, white on a blue field, representing a new constellation."

**1788** — The U.S. Constitution goes into effect with its ratification by New Hampshire.

**1835** — PT Barnum's circus begins first tour of United States.

**1872** — Pioneering feminist Susan B. Anthony is fined for voting in a presidential election at Rochester, N.Y.

**1885** — The Statue of Liberty arrives in New York Harbor from France.

**1894** — Labor Day becomes an official U.S. holiday.

**1908** — The Tunguska Event (presumed to be a meteor that exploded in Earth's atmosphere before striking the ground) occurs in central Siberia.

**1914** — Archduke Ferdinand of Serbia and his wife are assassinated at Sarajevo, setting the stage for World War I.

**1940** — The British successfully evacuate 300,000 troops from Dunkirk.

**1944** — Trinity Site is selected for the first test of an atomic weapon.

**1950** — The Korean War begins as North Korean troops, led by Soviet-built tanks, crossed the 38th parallel and launched a full-scale invasion of South Korea.

**1952** — MANIAC, a computer designed and built at the Laboratory, becomes operational.

**1953** — The summit of Mt. Everest is reached for the first time.

**1963** — Valentina Tereshkova, 26, becames the first woman in space in her Soviet spacecraft, Vostok 6.

**1972** — The linear accelerator at LAMPF delivers its first beam of 800 million electron volts.

**1973** — John Dean tells the Senate Watergate Committee about President Nixon's "enemies list."

**1985** — Two 13,000-foot-deep geothermal wells at Fenton Hill are connected underground as part of the Hot Dry Rock Program.

**1989** — Energy Secretary James Watkins announces a 10-point plan to strengthen environmental protection and waste management at DOE facilities.

**1992** — Czechoslovakia splits into two separate states.

**1998** — Federico Peña steps down as Energy Secretary.

**2006** — Los Alamos National Security, LLC, takes over management of the Laboratory for the Department of Energy's National Nuclear Security Administration.

**And this from the June 20, 1986 Newsbulletin** — A half-cup of dust from outer space may help researchers prove that building materials can be made on the moon. The precious cargo was collected during the Apollo 11, 15 and 16 missions and came from three different areas of the moon.

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.

*'For the love of archaeology…'*

# Lab's Vierra editor and co-author of book on past Southwest era

*by Erika Martinez*

"An appreciation of the diversity of tactics that people have used to survive in the past." That is what Bradley Vierra of Air Quality and Ecology (ENVP-AQE) hopes individuals will gain from reading "The Late Archaic: Across the Borderlands: From Foraging to Farming."

Vierra, cultural resources team leader in ENVP-AQE, co-authored and is editor of the book, which provides an insight to why past, Southwest, borderland societies resorted to agriculture to survive and why others continued to forage.

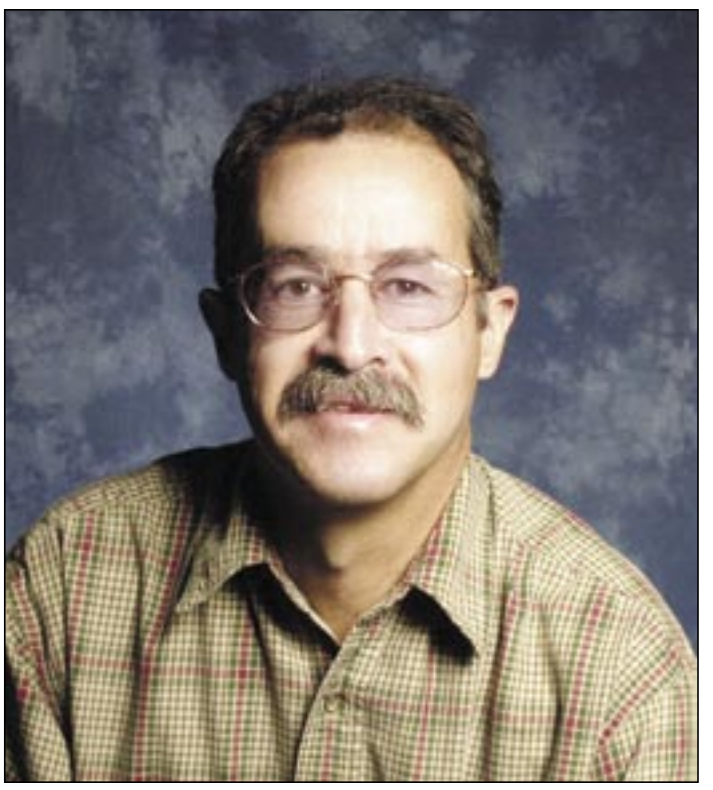
Vierra left the University of Texas, El Paso when he was offered a position at the Lab, which, he said, allowed him the privilege to gain "stewardship responsibility for a piece of New Mexico's cultural heritage." "I missed the Southwest, green chile and the archaeology," Vierra said.

Vierra's fascination with the co-existence of agricultural and hunter-gathering societies across the traditional political boundaries of the Southwest (Arizona and New Mexico), Texas and northwest Mexico drove him to ask the question, "Why did agriculture become an important part of the Southwestern economy, while foragers in Texas continued their hunting and gathering lifestyle?" This is the first time that such a broad aerial review of this research question has been conducted by scholars currently working on this problem, Vierra explained.

"Understanding the transition from a foraging to a farming economy is a central research issue in archaeology," Vierra said.

As editor, Vierra selected contributors who could present their current research on the Late Archaic period, about 1,500 to 3,000 years ago, across the various regions of the borderlands. The selected scholars covered topics that varied from desert foraging, early maize agriculture and the first villages, to the affects of foraging and mobility on human biology and stone tool technology. The culmination is a 328-page book that attempts to give readers a glimpse into the ways of life for these ancient Archaic people.

As part of a team that was involved with the excavation of Cerro Juanaqueña, located near Casa Grandes, Chihuahua, Mexico, Vierra explored the technology of stone tool manufacturing, which lead him to conclude that differences in stone vs. ground-stone technology actually reflected important changes in the division of labor between men and women. Biological studies supported this theory by comparing the leg bones of men, which were found to be similar to foragers, to the leg bones of women, which were similar to later agriculturalists. That is, men in this early agricultural society continued to forage across the landscape and therefore exhibited more muscular leg bones. In contrast, women in this society exhibited more gracile bone structure reflecting that they were residing at the villages for longer periods of time.



***Bradley Vierra***

***'Understanding the transition from a foraging to a farming economy is a central research issue in archaeology.'***

As the cultural resources team leader in ENVP-AQE, Vierra's work allows him to be a part of Los Alamos' historic preservation program. The Pajarito Plateau has a very rich cultural heritage that includes such treasures as 8,000-year-old campsites to 700-year-old ancestral pueblo villages to the remaining vestiges of the Manhattan Project of the 1940s, Vierra said. Having access to these historical sites offers Vierra "a rare glimpse into the ancient past at [Los Alamos]," he said.

"The insights we can gain from understanding how and why people coped with the uncertainties of living in this arid environment also can be used to understand the conditions and processes leading to the transition to agriculture (or continued foraging) in other parts of the world," Vierra said.

"The Late Archaic: Across the Borderlands, From Foraging to Farming" opens many doors to the unanswered questions that man has regarding his voyage through the survival of life, said Vierra.

"The Late Archaic: Across the Borderlands, From Foraging to Farming" was published by the University of Texas Press and is available at local bookstores.