the laboratory connection

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your community's link
to information, opportunities, and people
at Los Alamos National Laboratory

a word from the Community Relations Office

Each summer, the arrival of hundreds of student workers reminds us that the work force of the future will spring from their ranks. Statistics show that many of our most critically important workers are nearing retirement age. Unless we plan carefully, the Lab could face a shortage of trained staff to take their place.

To help prepare for our future needs, the Laboratory has launched the Critical Skills Development and Student Pipeline Program. The program, a variety of linked education and training activities, focuses on building the future technical work force.

The program's goals are to identify, develop, and inspire future scientific leaders, increase the diversity of the Lab's student pipeline, ensure a highly trained work force, facilitate systemic change in math and science education and serve as a national model to improve the quality of science, math, engineering, and technology education.

The Math and Science Academy, and internship and cooperative opportunities for high school, undergraduate and graduate students are just a few of the activities the program offers. During the past year, more than 2,000 students and faculty members have participated in research and learning initiatives in the fields of math, science, engineering, and technology. All students have had daily access to staff members and mentors and have had an opportunity to present their work at the Student and Postdoctoral Symposium.

In this issue of Lab Connection, we will take a look at some of the successes of the program and explore some new initiatives planned for the future.

Local Student Employees Shine in National Research Forum

A pair of award-winning Los Alamos National Laboratory interns is a shining example of how the Lab's undergraduate student program can serve as a pipeline of talent for the workforce of the future. Now in their fifth summer working at the Laboratory, Francisco DeMaria and Raven Rotsaert have been able to make a real contribution to scientific computing and have won national recognition in the process.

In November of last year, the college students and their mentor, Robert Kelsey, attended the national Sigma Xi Student Research Conference in Galveston Island, Texas, and won the second-place award in the math and computer-science category for their "Got XML?" poster, which gave examples of ways they had used the Extensible Markup Language (XML).

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Raven Rotsaert (left) and Francisco De Maria discuss the content of this year's poster submission with their mentor, Robert Kelsey (standing).

Student Employees
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XML is a computer markup language that can be applied to describe any kind of electronic data, information, or knowledge. It has been primarily used to describe documents on the Internet, but DeMaria and Rotsaert's mission is to seek out creative, alternative, nonweb-based applications of XML.

Kelsey is a member of Sigma Xi, the honor society for research scientists and engineers, and is responsible for their entry into last year's competition, which included 200 poster entries from more than 300 students. He called their second place finish in the math and computer science category "pretty respectable. I became a member of Sigma Xi by doing just what they did—sending an abstract and presenting at the conference in '91 or '92," he said. "At that time it was their means of getting new members."

DeMaria and Rotsaert have presented a poster every summer outlining their yearly contributions. Each year their choice of subject matter takes on an abstracted form to inform their viewers of their project: the "Got XML?" poster, presented two summers' worth of work and starts with a picture of the two modeled after the "Got Milk?" ads. Posters from previous years have included a "Virtual Water-Park."

The students had attended Pojoaque Valley High School together and are part of the graduating class of 2000. Now DeMaria is a computer science major at the University of New Mexico, and Rotsaert is studying mechanical engineering at New Mexico Tech, each of them going into their fourth year in their undergraduate career. They both hope to eventually work full-time at the Laboratory.

"I first came to the Lab for Take Our Children to Work day when I was a junior in high school," DeMaria said. "My mom (Clara DeMaria) works in the Applied Physics Division, and I heard Richard Barrett give a presentation on parallel computing and parallel software. I was really interested in it, and my mom asked him if he'd mentor me in computer science."

DeMaria was too young at the time for a job at the Lab, but began coming up after school for some informal mentoring with Barrett. At Barrett's invitation, Rotsaert began to accompany him. The summer before their senior year in high school, they were hired to work with Barrett in the Unified Parallel Software group. During their senior year, DeMaria and Rotsaert joined the high school co-op program and came up to the Lab for a few hours every afternoon, working on website design and other projects.

When Barrett was transferred to another group, the students changed mentors to begin working with Kelsey and XML.

DeMaria and Rotsaert are grateful for the opportunity to work with Kelsey and spend summers at the Laboratory.

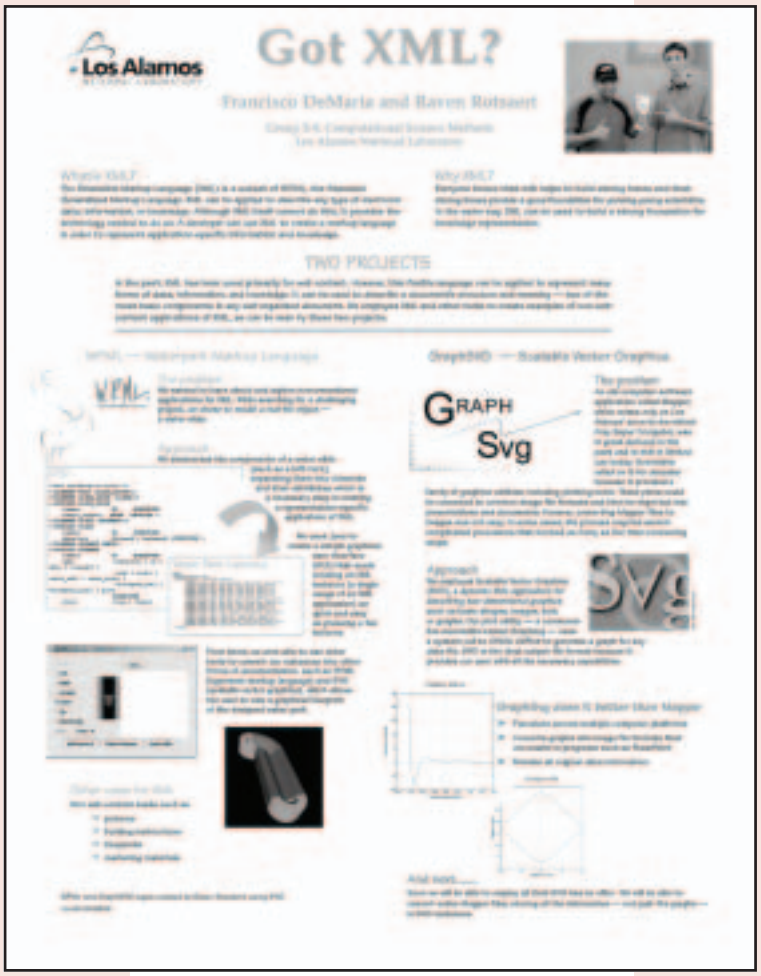
"The Lab's so big you can pretty much get into whatever you want," DeMaria said. "Since computer science is the field I'm going into, this job allows me to see real-world applications of computer science and programs."

Rotsaert plans to become an engineer, focusing on design.

"I am learning some valuable programming skills here that I can apply to engineering and other problem-solving skills," he said.

Kelsey hopes both young men may have a future at the Lab.

"At the Lab we need creative thought," he said. "These guys have really good imaginations and that's what we need to solve some of the problems we have."



Lab and NNMCC Will Offer Glovebox-Technician Training Course

The Laboratory will soon launch another technical training program designed to offer additional career options to local students and to supply the Lab's workforce pipeline. In partnership with Northern New Mexico Community College (NNMCC), the Lab will collaborate on a glovebox operation training course that will enable participants to earn an Associate's Degree and qualify for well-paid Lab jobs.

According to program coordinator Jerry Foropoulos, the program will closely parallel the two-year electromechanical technician training program. Under that program, a prospective employee is hired as a student and splits his or her time between school courses and Lab work until they accumulate enough credit hours to earn a certificate, making them eligible to hire on as a full-time employee. Once technicians are hired on full-time, they will be eligible for the technician education program and can complete their Associate's Degree at NNMCC.

Prospective student/employees for the glovebox technician training program will be recruited predominantly through local high schools.

"Historically, the Lab's tech pool has been drawn from the local community with little or no education beyond high school," Foropoulos said. "These are people who will handle radioactive materials and corrosive chemicals. They have gotten their training on the job, which takes up the time of more experienced workers. We hope this program will accomplish two things. We will guarantee that incoming techs will start with a minimum of an associate's degree. And since they will take technical courses aimed at glovebox techniques as part of their education, we will get new technical workers with a nuclear material handling capability."

In research or production, any type of nuclear material must be handled in a glovebox for worker safety. Because of how the gloveboxes are constructed, operators must learn to adjust to different working conditions.

Foropoulos explained, "You are in a fixed radius of work, controlling and moving things and there are numerous safety issues related to ergonomics, not to mention all the different subsystems of glovebox operation. You have to know how it is ventilated and how you can control that, the workings of the electrical systems, plumbing, water and solution handling, waste generation and removal, and the packing and unpacking of materials. There's a tremendous amount to learn, which makes a glovebox technician especially valuable."

A complete glovebox setup has been delivered to NNMCC for use in the program. Another training center has been assembled at TA-55.

"Another aim of the program is to allow new hires to learn as much as possible of the basics of nuclear materials handling without actually being exposed to nuclear material," Foropoulos said.

Glovebox-oriented materials handlers are deemed to have critical skills for the Laboratory's future operations, according to the Department of Energy's Critical Skills Initiative. According to Foropoulos, the training program is the culmination of some ideas that have been in the works for some time.

"Program managers need to be able to plan for projects years in the future and know that the techs will be there," he said. "We have an abundance of techs approaching retirement age, and this will be a way to guarantee a supply of technicians for the future."

The technician education program also offers educational opportunities to a historically underserved portion of the Lab population.

"Technicians used to be hired as a pair of hands, doing relatively menial tasks," Foropoulos said. "Not much thought was given to their education and what they might aspire to. We want to encourage them to return to school to benefit their careers."

Although the Lab offers a number of educational programs for exempt employees, the tech-education program offers opportunities for nonexempts, including those who are not new hires.

"Nearly 35 techs from 20 to 50 have taken advantage of this program, taking about eight hours of classes a week," Foropoulos said. "We want to narrow the education gap among our technicians and make them more marketable."

Nuclear Materials Technology group leader Tim George and his deputy, Jim Balky, are among Lab leaders instrumental in developing the technical education program. Group leaders Dana Christiansen and Joel Williams also played key roles in its creation.

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Technicians must learn a variety of subsystems to safely handle nuclear materials in a glovebox environment.

American Indian Astronaut Reaches Out to Local Students

"You can do anything you want to do in life," astronaut John B. Herrington told students here recently. "You just have to be willing to work hard for it. Also, pay attention to the folks that are trying to help you."

Herrington, NASA's first American Indian astronaut, visited with more than 2,000 students from eight area schools, including the Ohkay O'Wingeh Community School, Pojoaque High School and Middle School, San Ildefonso, Santa Clara and San Juan Pueblo schools, as well as De Vargas Middle School, Capital High School, and the Institute of American Indian Arts in Santa Fe.

Herrington flew for 13 days on the STS-113 *Endeavor* from the end of November through mid-December in 2002. It was the sixteenth shuttle mission to visit the International Space Station. Mission accomplishments included the delivery of the Expedition-Six crew, the delivery installation and activation of the P1 Truss, and the transfer of cargo from the shuttle to the station.

Since his space flight, he has used his new celebrity status to visit and inspire young people, particularly Native American students.

Astronaut John Herrington began his presentation to the students assembled at San Juan Pueblo Community Gym by giving an overview of his experiences in space. He also showed a video of the STS-113 Endeavor mission.

"This trip has been excellent," he said. "Part of our job is community outreach, and trying to inspire students is another part of that."

Herrington said that when he was eight years old he used to sit in a cardboard box and dream about being shot to the moon. The other important factor in his becoming an astronaut were the people in his life who were supportive of his dream.

"There were people, like my parents who insisted that I go to college, and others who pointed me in this direction. I didn't necessarily start out on this path," he said.

Herrington said he started off in college studying to be a forest ranger, but that biology and he were not a good match.

"I got suspended my first year in school and I was very fortunate that a person I worked with, as a rock climber on a survey crew, talked me into going back to school," he explained. "So, I went back to school with the idea of being an engineer with a focus on math because I'd always been good in math."

He graduated in 1983 with a degree in applied mathematics from the University of Colorado and then he joined the Navy. He received his Master of Science degree in aeronautical engineering from the U.S. Naval Postgraduate School. Then he applied to the test pilot school twice and was accepted the second time around.

Herrington is very aware of his status as the first-ever Native American to fly in space and said he believes that his persistence has always been a key factor in his success.
"I'm incredibly proud and honored to have the opportunity to serve my country in this capacity as an astronaut. That's just a fabulous thing. If my heritage as a Chickasaw Indian and the fact of what I do here will help motivate somebody who might

A crowd of students, teachers and community members surrounds John Herrington to wait for autographs. Herrington had just finished making his presentation at the Santa Clara Community Building complex. In two days, Herrington visited with more than 2,000 students from eight area schools.

not otherwise think they could achieve their dreams, then that's a good thing," he said. "It's an honor really to be in that position. But I love what I do, and it's fun, and if people attach to that, that's great."

Herrington spoke about his space exploration and his experiences and challenges pursuing his dream. He also showed a video of the STS-113 *Endeavor* mission.

Students eagerly raised their hands and asked questions ranging from how you go to the bathroom in space to what his most vivid memory was.

"You go to the bathroom using a vacuum," Herrington answered.

He also said that his most vivid memory was of seeing earth from a window in the Endeavor.

Herrington said that he has visited New Mexico many times to participate in American Indian Science and Engineering Society (AISES) activities.

Herrington's visit was cosponsored by the Laboratory's Bradbury Science Museum, the New Mexico Office of Indian Affairs, and the Tribal Relations Team from the Government Relations Office.

Bathtubs and Good Light are Distinctive Features in the Oppenheimer House

Housing in Los Alamos doesn't come cheap. It never did. The November 1942 Manhattan Engineer District site report predicted that building the infrastructure and buildings necessary for the project would be a real challenge. But because of the importance of the project, building began.

Los Alamos was several thousand feet above the Rio Grande valley, far from sources of labor and construction materials, 40 miles from the nearest railroad, and accessible only by barely passable roads. It also lacked water and natural gas and had only a limited electrical supply.

During the war, about $26 million was spent on the construction of barracks, a mess hall, officers' quarters, laboratory administration and technical buildings, a theater, an infirmary, apartments, utilities, streets, and fencing. That's about $200 million in today's dollars.

Each new wave of incoming personnel led to a new wave of construction. During the first phase, before the Lab opened in April 1943, the Sundt Company of Tucson, Arizona, had built or remodeled 100 buildings. Sundt was selected by Colonel Lyle Rosenberg, the Albuquerque district engineer for the Corps of Engineers, because it was well equipped to handle the task and had just completed Camp Luna in Las Vegas, New Mexico. Sundt was also free to take the job. Sundt could also more easily ensure security because it had its own plumbing, electrical, painting, and transportation departments.

Bergen and Helene Suydam are the current owners and occupants of J. Robert Oppenheimer's house on Bathtub Row.

The Sundt houses were built quickly, according to a rigid building schedule, but they were not inexpensive nor were they the most attractive. An act of Congress had established a civilian housing agency that set up standards for housing in the United States to be built during the war years. This agency specified the standard fixtures for the inside of the houses–for instance it specified only showers, no bathtubs. Bathtub manufacturers in the United States had stopped making bathtubs in 1942, so even if they had been called for, they were hard to find.

The scientists and officers who were fortunate enough to be housed in the Ranch School buildings had the only bathtubs in town, which is why the area is called "Bathtub Row."

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Bergen and Helene Suydam are the current owners and occupants of J. Robert Oppenheimer's house on Bathtub Row. The Suydams arrived in Los Alamos in 1956. Bergen worked at the Laboratory in the Theoretical or "T" Division until his retirement in 1986.

"You were assigned housing based on your years of service and your salary," explained Helene Suydam. "We were third or fourth on the housing list and we tied with another couple. We had been here longer though, so we were assigned this house."

Although they never met Oppenheimer, she remembers an event that happened one afternoon very clearly.

"I was taking a nap and I heard voices on the terrace. I got up to see who it was and there was Dorothy McKibbin and Kitty Oppenheimer walking up to the house," Suydam said. "Kitty was showing Dorothy the house."

Suydam explained that the house was originally built for the Ranch School's headmaster's sister. She was a painter, which is why the living room and studio have so many windows and so much light.

Where was Oppenheimer's favorite spot? "He liked to stand in the middle of what is now the Community Center Building and look at the Sangre de Cristos," Suydam said.

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Bradbury Science Museum Galaxy To Go

The Los Alamos National Laboratory's Bradbury Science Museum will give regional students an opportunity to reach the stars with its new "Galaxy to Go" program. This new program, part of Los Alamos National Laboratory's Science on Wheels educational outreach initiative, uses the STARLAB Portable Planetarium, a nylon-reinforced, flame-retardant, inflatable planetarium.

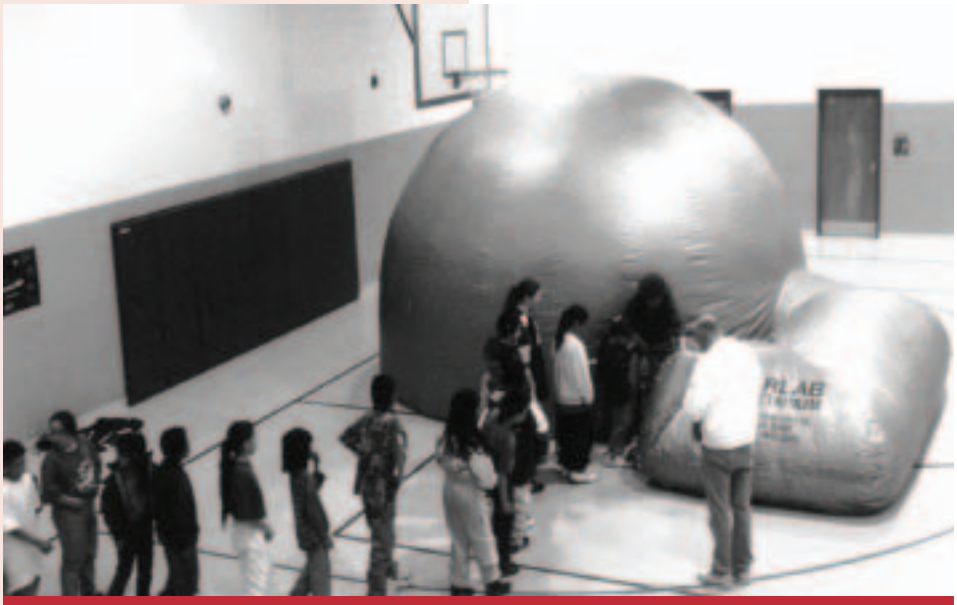
"We have enough room inside for 30 students and two adults," explained Bettie Bedell, the Bradbury Science Museum's science education coordinator. "We are hoping students and teachers will find this an exciting addition to our Science On Wheels program."

The STARLAB is an inflatable dome that simulates the night sky and allows users to study the size and location of the planets, their moons, and stars. The planetarium is made of durable fabric that ensures opacity even in fully lighted rooms. A powerful fan inflates the dome in about 15 minutes and circulates air throughout. Air is exchanged every five minutes through a carefully designed ventilation system that maintains a comfortable temperature and prevents excessive air loss during students' entry and exit.

The STARLAB projector creates brilliantly sharp images using a high-intensity halogen cycle lamp. The lamp's brightness is fully adjustable. Dimmable side lamps or house lights make it easy to brighten the entire dome to make it easy for instructors to read a lesson or a map.

The projector can rotate to simulate realistically the night sky for seasonal changes, sunrise, sunset, multiphase moon or global rotation. The image rotation on the dome sometimes creates a sensation of movement. The projector can also be set for any month of the year, time of night, and geographic location. In the "Galaxy To Go" program the latitude is set for viewing the Northern New Mexico night sky.

The Science on Wheels presentation will focus on the solar system, the constellations, and mythology. Ooohs and ahhhs fill the dome as the lights go down and the stars come up in the simulated night sky.



The STARLAB is an inflatable dome that simulates the night sky and allows users to study the size and location of the planets, their moons, and stars. The planetarium is made of durable fabric that ensures opacity even in fully lighted rooms.

"Our main goal is to support school curriculum requirements while also exciting the students." Bedell said. "We want them to be able to find the constellations and planets that are visible during each season. Then we want them to be able to go home and look at the actual night sky with their parents. They will be given a star-finder sheet to help them do that."

The "Galaxy To Go" program has special space requirements. A space at least twenty-five feet long, twenty-five feet wide, and twelve feet tall is necessary. There can be no light fixtures, air conditioners, heaters, etc., hanging below twelve feet. No other activities can be held in this location during the "Galaxy To Go" program. Teachers MUST be present in the dome with their class at all times. Programs last approximately fifty minutes. This time includes the students' entrance into the dome and exit from the dome.

The Science on Wheels Program will begin its second year this October. "Galaxy To Go" is the eighth program added to Science On Wheels. Additional Science On Wheels programs include: "Volts and Jolts," "Circuit Connections," "Robomania," "Magnetic Attraction," "ChemLab," "Let's Rock," and "Lights, Spectra, Action!"

When registering for the Science On Wheels program, a teacher may select one date with a program like "Volts and Jolts" for a minimum of four and a maximum of six 50-minute sessions. In addition, they can select one other date with a different program like "Galaxy to Go" for the same teachers and students.

"We really like to visit classes twice if we can," Bedell said. "It seems we have more of an impact on the students' attitudes toward science, and the kids are excited when we return with another program."

Lab Project Helps Other States Dispose Of Radioactive Sources

The Laboratory's Off-site Source Recovery Project recovers and stores radioactive sealed sources that cannot be disposed of commercially such as those formerly used in oil-well drilling and experimental research. One of the primary states using the program is Florida because of the high number of pacemakers in use there. The radioactive energy sources used in early pacemakers are among those that qualify for the program, said Shelby Leonard, the project's Team Leader.

The program is really about registering and recovering radioactive sources and while the program has been in place at the Lab since 1979, said Leonard, it has grown in importance since September 11 as Congress and the National Nuclear Security Administration seek to ensure that radioactive sources are properly handled once they are no longer needed, or "excess."

"In the case of pacemakers, the sealed radioactive sources were the best way to provide energy that would last for the rest of the life of the person using it. It's not the kind of thing you want to have to go in and replace," said Leonard. "Once lithium-batteries replaced the sealed sources we also had to help manufacturers of the older pacemakers dispose of their now unneeded radioactive parts. Hospitals keep track of the patients with the older pacemakers–right now there are about 150 of them still in use–and we're notified when the sources need to be picked up."

Sources become excess for a number of reasons, including changes in technology and discontinuation of the work for which they were originally obtained. After World War II, what was then the Atomic Energy Commission (now the Department of Energy) distributed sealed plutonium-239 sources to colleges and universities all over the country to encourage the development of peacetime use of radioactivity, but now most of those sources are no longer needed, Leonard said. The recovery program covers all radioactive sources listed under Public Law 99-240 or are DOE owned. Currently, almost 7,000 sources have been located and moved to the Lab, and it's estimated that a total of 18,000 sources will need to be recovered by the end of the decade.

At one time, the plutonium-239 sources were put through a procedure to extract whatever useful material was in them using an acid process, but it was later determined that not only did it not align with the Lab's weapon mission but it was also terribly expensive, said Leonard. Currently, plans are to hold the sources in Area G, already a waste storage area for as long as necessary. "We hope to eventually be able to store the drums at the Waste Isolation Pilot Project (WIPP) site but right now that's excluded because WIPP can only take radioactive waste directly related to weapons work," she said. "Since WIPP storage makes the most sense on the number of levels, we're hoping to eventually get an exemption and are packaging and storing the drums to the highest level of standards available and right now, that means WIPP standards."

To obtain additional information on the project, contact the Off-site Source Recovery Team at (505) 667-6701 or 1-877-676-1749. To learn more about the project visit the Team's pages at http://orsp.lanl.gov.

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Evidence Clears Lab Procurement Specialist in Mustang Case

Earlier this summer, a University of California and Los Alamos National Laboratory internal investigation into the allegation that a Laboratory employee attempted to purchase a Mustang automobile with government funds uncovered evidence that the employee was not responsible for any wrongdoing in the case.

The UC-LANL legal team review indicates that Laboratory employee Lillian P. Anaya, a procurement specialist in the Business Operations Division, may have been a victim of fraud perpetrated by a third party and at no time attempted to purchase a Mustang automobile with her LANL purchase card.

The evidence clearly shows that Anaya promptly disputed the charges related to the Mustang when they appeared on her Laboratory purchase card statement. Anaya, who has been on paid administrative leave since August 2002, is scheduled to return to work next week and will not be subject to any disciplinary action in this matter.

"Ms. Anaya cooperated fully with our investigative team and we look forward to welcoming her back to the Los Alamos team," said Interim Laboratory Director George P. "Pete" Nanos. "Using the best investigative practices available to UC and the Laboratory, the facts of the case are now better known, with every indication that no one at Los Alamos ever tried to buy a Mustang with taxpayer money."

"This is a validation of the University of California and Laboratory system for investigation of allegations of fraud," he said.

Phone records and documents show that a telephone number mix-up was the genesis of this case.

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Los Alamos NATIONAL LABORATORY

Ideas That Change the World

Lab Hosts Family Festival

Thousands of Laboratory employees and their families attended last month's Family Festival, which featured music, food and games, including large, inflatable playhouses and a dunk tank. Lab Director G. Peter Nanos spoke about the Laboratory's contributions to society over the years and read a proclamation from former University of California President, Richard Atkinson.

Inside

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