A LIGHT TOUCH — John Gronager (5900) goes all-out each year with a holiday light display that features almost 25,000 lights synchronized to music via 1,488 computer-controlled channels. The display lights up John's Northeast Heights home each night during the holiday season from 5-10 p.m. Read more about John's magnificent obsession in a story on **page 7.** (Photo by Randy Montoya)

Sandia LabNews

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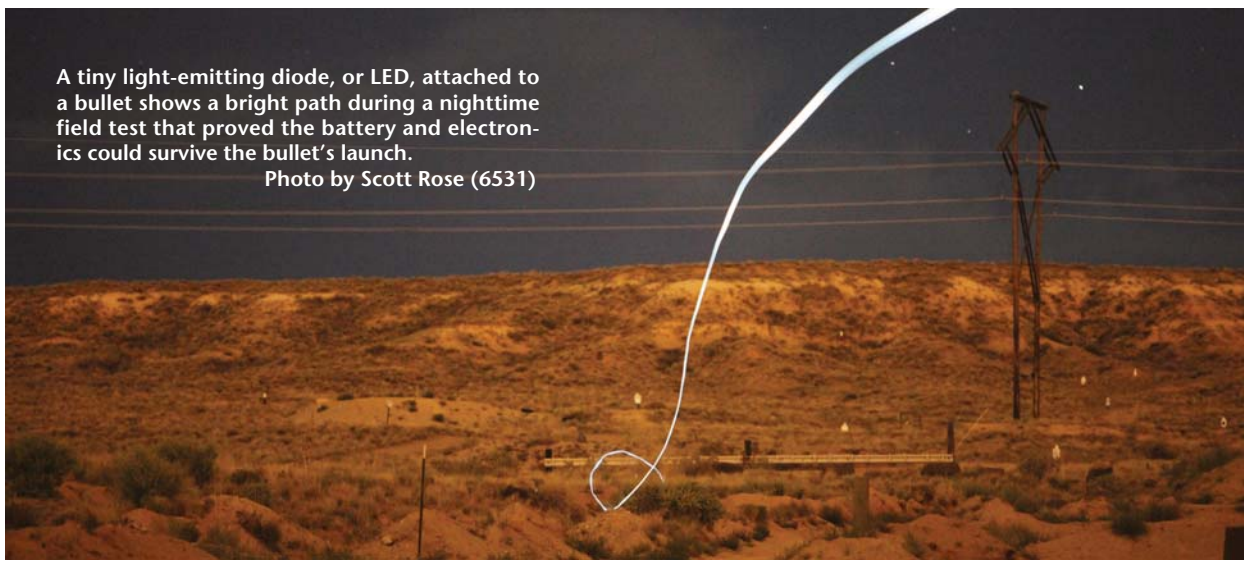
Sandia National Laboratories

Rita Gonzales is NNSA DP Employee of the Quarter

RITA GONZALES has been named as an NNSA Defense Programs Employee of the Quarter for Sandia, an award that recognizes people for going beyond the call of duty in supporting NNSA missions. See story on **page 4.**

Riding the bullet: Self-guided bullet prototype developed at Sandia can hit target a mile away



A tiny light-emitting diode, or LED, attached to a bullet shows a bright path during a nighttime field test that proved the battery and electronics could survive the bullet's launch.
Photo by Scott Rose (6531)

By Heather Clark

Take two Sandia engineers who also are hunters, get them talking about the sport, and it shouldn't be surprising when the conversation leads to a patented design for a self-guided bullet they think could help war fighters.

Sandia researchers Red Jones and Brian Kast (both 6531) and other colleagues have invented a self-guided bullet for small-caliber, smooth-bore firearms that could hit laser-designated targets at distances of more than a mile (about 2,000 meters).

"We have a very promising technology to guide small projectiles that could be fully developed inexpensively and rapidly compared to other proposals," Red says.

Sandia hopes to partner with a private company to complete testing of the prototype and bring a guided

(Continued on page 7)

Sandia hires more than 1,000 in FY2011 to transfer knowledge to new researchers

By Heather Clark

If you've noticed a lot of new faces and you're saying good-bye to many familiar ones, you're not alone.

Both retirement and new-hire numbers are above average, but overall the number of employees at the Labs has been stable at about 10,400 members of the workforce at all sites.

In fiscal year 2011, about 1,130 employees were hired and more than 400 employees retired, according to Human Resources data. In the current fiscal year, as many as 500 more people are expected to retire, says Human Resources Director Karen Gardner. Retirements typically have been 200 to 250 per year in the past.

Karen says the number of retirements was anticipated due to the Labs' demographic trends, as well as to changes in retiree benefits that go into effect Jan. 1.

Human Resources has been proactive in communicating benefits changes to potential retirees, giving them the information they need to properly plan their retirements, Karen says.

"As soon as the leadership makes the decision, we

(Continued on page 7)

Inside . . .

Sandia helps ensure range safety during recent Mars launch. See **page 6**.

That's that

Editor's Note: Having been in the news (and newspaper) business for a long time, I think I know a good story when I see one, and Iris Aboytes has written more than her share of good ones. Of course, if you've read this paper over the past 10 years, I'm not telling you anything you don't already know. Iris' stories, written in a unique voice and style that is hers alone, have inspired us, entertained us, enlightened us, and introduced us every two weeks to some of the remarkable people we call fellow Sandians.
Someone once said that "Great art is that which makes you want to change your life." By that definition, Iris is more than a writer; she's an artist. She retires on Dec. 23. The Lab News *asked Iris to share a few thoughts before she goes. Here's what she wrote:*

* * *

It seems like it was just yesterday. But it was 10 years ago when I sat on a stack of lumber interviewing retiree Irv Hall. He had donated $30,000 for the Habitat for Humanity House he was helping build.

I read an article about water – when it pools, it becomes stale. I remember thinking that is not what I want for my life. So, I have decided to retire before that happens.

IRIS ABOYTES

I feel wonderful thinking about all the Sandians I have met through the stories I have written: The determination and strength of Bobby Baca. At age 5 in spite of his disability, he learned to tie his shoes with one hand – small wonder he is now a world championship golfer. Melissa Sisneros whose home did not have a floor. As a young single mother she worked full-time at Sandia, then went to school full time. Her rewards – a beautiful daughter, a master's degree, a great career, and houses with floors.

The jaw-dropping inspiration of Tan Thai, a Vietnam refugee – the boat was overcrowded with 40 or 50 people of all ages. The courage and valor of retiree Lt. Harold Clay – "One of the hardest things about returning from Vietnam was getting used to sleeping in a quiet bed. I was used to sleeping on rocks with the ground reverberating."

Retiree and super athlete Dick Fate lost his leg to cancer. But on a beautiful June day, the loving father wore a prosthesis and walked his daughter down the aisle. "My daughter will be the star. I will just be the bride's proud father – and a dream will be fulfilled!"

Then there was Brian Griego. He was in an accident that crushed most of his body. He was told he would probably never again walk on his own. From a wheelchair he coached his son Joshua's wrestling team. Joshua won in overtime. But Brian was the real winner; not only did he walk again, but returned to Sandia's Pro Force.

The story that is closest to my heart is about former Sandian Lewis Bird. I interviewed Lewis for an Employee Caring Program story. Lewis had stomach cancer and had used several United Way agencies. His unassuming gentleness and peace was beyond my comprehension. About a week after the story was finalized, Lewis died. Rest in peace, my friend.

I came to Sandia as a secretary in then-6252, Geothermal Research. "My guys" as I called them, were great teachers. For a period of about six years, they were my family.

Then, like a bird, I grew up and flew to public relations and discovery. A miracle happened right before my eyes. I became a writer. How? When? I don't know. My work life changed. It was more meaningful and rich. I became spoiled. I got to meet the best of the best.

In the midst of all this excitement I became a nana (grandmother). Wow! What a transformation. It was as if someone had given me a new set of eyes. Everything seemed brighter, more exciting, and oh, so much more enjoyable. I read *Winnie the Pooh* with joy and animation, and the *Cat in the Hat* was actually entertaining.

The sidelines at soccer, basketball, and football games call to me by name. Each one knows that it is CJ, Maddie, Alex, or Mackie, one of my grandchildren, out on the field. I never thought I would admit to becoming a groupie. My mantra for them became run, run, run, and have lots of fun.

So, as much as I want to keep writing, I want to go be Mater, the tow truck, to my grandson Jhett's Lightning McQueen. To quote Mater, "I'm happier than a tornado in a trailer park."

Life is good.

– *Iris Aboytes*

Two Sandians win Women in Technology Achievement Awards presented by New Mexico Technology Council

Sandians Elizabeth Lopez (2144) and Susan Rempe (8635) have won Women in Technology Achievement Awards from the New Mexico Technology Council (NMTC). The awards were announced at the council's fourth annual Recognition Celebration Honoring Women in Technology, held in Albuquerque last month.

In addition to the two winners, Sandians Bianca Thayer (1931) and Andrea Walker (5635) were nominated for the award, which is aimed at recognizing the exceptional women in New Mexico who are working in a technology field and who encourage other women to pursue careers and leadership roles in technology.

ELIZABETH LOPEZ

The award is driven by the NMTC's conviction that inspiring more women to choose technology careers is critical to ensuring the nation can compete in the global economy, that the US maximizes opportunities for innovation, and that the technology industries are as diverse and creative as the people they serve.

Elizabeth, a computer scientist who works on software design, development, and testing, was nominated for the award by Community Involvement Dept. 3652 Manager Amy Tapia. Amy recognized Elizabeth's involvement in the Society of Women Engineers and participation in numerous outreach programs designed to encourage young people to consider careers in science, technology, engineering, and mathematics (STEM). In addition to her STEM-related volunteer activities, Elizabeth has also been involved in a number of youth-oriented community service programs, including Big Sisters and Youth Development Inc.'s Mentoring Children of Promise program.

Susan, who does computer software research and development in Sandia's nanobiology group, was nominated by her manager, Eric Ackerman (8635). According to Eric, "Susan is an outstanding scientist who is making world–class contributions at the intersection of biology with nanoscience." This year alone, Susan has published multiple important papers in top science journals, received several prestigious speaking invitations to scientific conferences, and won an R&D 100 Award for a revolutionary new desalination membrane with a potential for global impact. She has donated her time to scientific colleagues by helping organize meetings and conferences and to the local community in various volunteer capacities.

SUSAN REMPE

The New Mexico Technology Council is a member-driven association of businesses, organizations, and tech professionals working together to promote the growth and success of New Mexico's technology business sectors. The organization believes the technology community is the catalyst for inspiration and leadership that transforms the state into a world center for business innovation, creative thinking, community involvement, and educational support.

Sandians who volunteered their time to help plan the NMTC celebration included Ann Riley (10222) from Sandia's Small Business Utilization Department, Latisha Leverette (4826) from Facilities, and Cecelia Venuk (0422) from Sandia's Surety Assessment and Engineering Center.

Employee Recognition Award nominations sought

The Employee Recognition Awards program honors individuals and teams whose work or contributions in support of Sandia's mission and values have been exceptional. Nominations for the award will be accepted from Jan 10-31.

The ERA program recognizes excellence in five categories, four for individual nominees and one for teams.

The individual categories are: technical excellence; exceptional service; leadership (which is also the category to acknowledge an individual for demonstrating exceptional people skills, etc.); and, new this year, Ethics and Integrity, which recognizes employees who have demonstrated the highest standards of integrity and ethical business conduct.

The team category recognizes teams whose exceptional achievements are critically enabled by teamwork and model the value of people working together toward a common goal, proactively looking for and acting upon opportunities to improve, while being fully accountable for their performance.

Nomination forms with detailed instructions will be available from Sandia's internal web homepage or at http://info.sandia.gov/era. The website will be available Jan. 10. Each division has an ERA coordinator, also listed via the link above.

Any current, regular Sandia employee may nominate individuals or teams.

A separate nomination form must be submitted for each individual and team nomination. A combined total of 122 individuals and teams will receive corporate Employee Recognition Awards.

ERA individual winners and designated representatives from winning teams will be recognized at the Corporate Employee Recognition Night banquet on July 28.

Retiree Deaths

Robert G. Piper (age 92) . . . . . Oct. 20
T. Vincent White (88) . . . . . Oct. 25
Charles G. Thomas (71) . . . . . Nov. 2
Mary Baker (82) . . . . . Nov. 11
Edward O. Steele (86) . . . . . Nov. 11
Gilbert Torres Leyba (78). . . . . Nov. 14
Paul M. Stanford (76) . . . . . Nov. 18
John L. Daniel (73) . . . . . Nov. 18

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LOCKHEED MARTIN

Future transportation energy needs

Sandia's Dawn Manley testifies before California senate committee

By Mike Janes

When the state of California's Senate Transportation and Housing Committee decided to hold an informational hearing on meeting the goals of AB 32 (a much-publicized piece of California legislation that aims to reduce greenhouse gas emissions to 1990 levels), it knew it could turn to Sandia for objective, science-based expertise.

DAWN MANLEY

Due largely to the proactive work of government relations manager Karen Scott (162), the organizers of the committee looked to Sandia when forming a panel of experts who would brief the state senators. Dawn Manley (8000), currently serving as deputy to Div. 8000 VP Rick Stulen, was selected as one of three witnesses to deliver a transportation fuels overview for the Senate committee on Oct. 24 at the state Capitol in Sacramento. This marked the first time a Sandian has testified in Sacramento, and it represents an important milestone in Rick's ongoing strategy to work more closely with California state government.

In 2006, the California legislature passed and the governor signed AB 32, which the state's Air Resource Board (ARB) is required to implement. The ARB's own measurements show that transportation accounts for 38 percent of greenhouse gas emissions in the state, hence the committee's focus on transportation fuels.

"Our purpose was to help inform the decision-making process as legislators try to figure out viable methods for reducing the carbon intensity of California's transportation fuels," says Dawn of her and her co-panelists' objectives. Mary Nichols, chairman of the state ARB, and Daniel Kammen, a distinguished professor at the University of California, Berkeley, also provided testimony as part of the overview panel.

Dawn's testimony, which included 10 minutes of comments and corresponding slides, focused largely on the practical constraints associated with implementing technology strategies to meet aggressive federal and state energy policies.

As an example, Dawn cited the Renewable Fuels Standard, a federal requirement that sets targets for biofuel production and volume. There is a potentially a big mismatch between the amount of ethanol biofuel that would be produced and the infrastructure to both absorb and distribute it.

Currently, only 3 to 5 percent of the current US transportation fleet are flex-fuel vehicles, which can operate on gasoline blends containing up to 85 percent ethanol (E85). Approximately 2,400 gas stations in the US — only a fraction of the 160,000 gas stations in the country — can dispense E85.

In her testimony, Dawn pointed out that two possible solutions are to have either higher blend requirements for all vehicles or more flex-fuel vehicles that can accept up to 85 percent ethanol. She also reminded the committee that the seemingly modest policy change of going from 10 to 15 percent ethanol required waivers from the Environmental Protection Agency. Also necessary was testing to demonstrate that higher blends are safe and free from higher emissions, and education of consumers who need to know when and how to use E15 ethanol.

The proposed changes in ethanol policies, Dawn says, are just one example of how a shift to advanced transportation technologies such as electric vehicles, fuel cells, and other biofuels pose enormous challenges.

"Policymakers need to have ways to think about the evolution from the current state of transportation energy to the desired future state," she says. "It is one thing to set aggressive targets on emission reductions, but how do you get there?" Scenario analysis, which examines options for reaching desired future states, is one such way to get a handle on the various technologies, she told the committee.

Others at the hearing expressed strong opinions about electric vehicles becoming a standard technology in the US transportation fleet. But, even if the assertion proves true that a vast majority of vehicles in the year 2050 will use some form of electrification, Dawn echoed a recent op-ed article in the *Washington Post* authored by Bob Carling (8300), reminding the committee that most of those vehicles will likely still be using a combination of electric and combustion engines since it is unlikely the fleet will be composed of pure battery electric vehicles.

"As Bob has pointed out, we need to realize that there is still much to be gained with the combustion engine," Dawn says. "Even with all the exciting new technologies out there, a good chunk of electric vehicles are still going to be making use of the combustion engine."

She also emphasized to the committee that speed and scale are key in terms of advanced technology development, since it takes 15 to 20 years to change over the transportation fleet. "We all tend to think that hybrids are a mature transportation technology, but the fact is that they still only make up about 5 percent of all vehicle sales today," she says. "We still have a long way to go."

During the question-and-answer period, Dawn reflected on a recent visit to China and suggested that decision makers in the US can learn some lessons from their counterparts in Asia.

"When making decisions about transportation energy investments and technology development, the Chinese have described their strategy in terms of points, lines, and areas," she explained. "'Points' refers to dense urban areas, and they consider the kinds of vehicles that will make the most sense there. 'Lines' are what connect those urban areas, so the Chinese think about the transportation strategies that are most effective in doing that. Finally, 'areas' are the broader, rural and agricultural regions of the country, so again, they look at the unique transportation needs in these areas and build their strategies around them."


DON'T FORGET COMBUSTION — Testifying in front of the state of California's Senate Transportation and Housing Committee, Sandia's Dawn Manley reminded committee members that most vehicles in the coming decades will likely still be using a type of combustion engine. Fortunately, research conducted at the Combustion Research Facility, located on the grounds of the new Livermore Valley Open Campus (LVOC), can continue to improve engine performance and efficiencies. (Photo by Randy Wong)

No one technology or policy will fit every transportation need, Dawn asserted to the committee.

"Here in the US, we are accustomed to buying gasoline, getting into our vehicle, and driving off. In the future, we need to think differently about our transportation needs and applications."

Sandia CaliforniaNews

Sandia/California photographer Randy Wong was inspired after seeing a news story about Dallas-based pet photographer Lisa Berg's pro bono work photographing homeless shelter dogs, which has dramatically increased adoption rates in the area. While photographing a Sandia Helps and Reaches Everyone event (SHARE) in October, Randy met Lisa Reese of Greater California German Shepherd Rescue (shown here with canine ambassadors Jake and Keona). He offered his services to the organization and at a recent adoption event photographed some of their available dogs, such as Gretchen, a one-year-old female shown on the right. Randy plans to continue working with Greater California German Shepherd Rescue and other local rescue and shelter organizations.

NNSA/DP Employee of Quarter Award recognizes Rita Gonzales for strategy to be used in future

By Sue Major Holmes

The development and production strategy Rita Gonzales (1750) and her team used in the B61 Life Extension Program (LEP) grew naturally from the way she has organized work throughout her Sandia career.

Rita has been named as an NNSA Defense Programs Employee of the Quarter for Sandia, an award that recognizes people for going beyond the call of duty in supporting NNSA missions. She says she was both honored and humbled to have received it.

"It wasn't all me; it's a team," Rita says. She says she hopes she "helped with the vision and set the standard, but the people that I work with are really the folks who get a lot of credit."

"We've developed a common strategy so that everybody doesn't have to invent the wheel every time. . ."

As manager of Mixed Signal Application-Specific Integrated Circuits (ASICs) and System-on-Chip Products, Rita led a multidepartment effort to develop and deliver ASICs for the B61 program.

Senior Manager Dave Sandison (1740), who nominated her, says she coordinated with weapons systems groups, radar and fireset owners, and seven departments to develop a plan for delivering packaged components.

A development and production strategy

The B61 became part of the US stockpile in the 1960s, and a number of its components are nearing the end of their design life. Modifications also are required to conform to modern Air Force equipment and aircraft.

Dave says Rita's efforts "resulted in a clear development and production strategy that is now baselined in the B61 phase 6.2/6.2a study."

"I don't know that we had a real cohesive strategy before," says Rita, who has been with Sandia for 20 years. Dave says her demonstrated ability led to her recent promotion to senior manager for the Microsystem Design/MESA Products group.

"She's one of our very best," he says.

Rita sums up the strategy in three parts: ensuring that goals, objectives, and requirements are aligned with those of the customer; making sure all the organizations involved understand the responsibilities and commitments so "we're all moving to those same goals and objectives"; and setting down an efficient way to implement the strategy.

It's a plan that will be used in the future.

"We've developed a common strategy so that everybody doesn't have to invent the wheel every single time, and use a well-defined common flow" that ensures a quality product in the end, Rita says.

She came up with the strategy and flow over several years.

"There are challenges with getting people to buy in and believe in the vision and then to use it," she says.

Now, she says, those involved challenge each other to stay on the path.

"It's not me preaching it anymore. It's not actually me doing anything other than making sure the vision is appropriate. … So I can sit back and watch it go, which is really nice," she says.

A multi-organizational effort

An ASIC by its nature is a multi-organizational effort that brings input from many customers, program management, design, packaging, fabricating, testing, and quality control into development and delivery at various stages, with the ASICs produced in Sandia's in-house MESA fab, Rita says.

RITA GONZALES (1750) has been named as an NNSA Defense Programs Employee of the Quarter. (Photo by Randy Montoya)

"So it's like all these different customers are coming to us," she says. "For example, in the B61, all those are folks who are going to be getting ASICs from us; we had to work with each one individually to gather all their different requirements and expectations and schedules. Trying to coordinate all that is obviously challenging."

Rita says she led teams before becoming a manager, and put a structure in place for the first program she ever led.

"I just worked in a little bit more organized fashion, so I started by leading programs myself," she says. She modified her organizational structure as her responsibilities grew to require more coordination of people and efforts.

"When I became a manager, that strategy just grew to be a much bigger picture and affected multiple programs," Rita says. "And in all honesty, when I became a manager and the staff working under me took it over, they improved it. They made it way better."

Security listens and responds

Feedback from SEC2011 activity drives changes to security practices

Note: *The introductory message here was written by Div. 4000 VP Mike Hazen, Sandia's chief security officer. Following Mike's remarks is a list of some actions Security has undertaken in response to feedback from the SEC2011 activity.*

The future of security is changing at the Labs and across the NNSA enterprise. Your feedback during the recent SEC2011, Security Learning and Feedback Activity, is helping shape these changes. During this structured learning event, we enlisted your help to develop concrete steps to achieve a sustained level of security performance. I am excited about the opportunity these changes present to deliver threat-relevant, customer-valued security solutions that will facilitate mission execution at the Labs.

MIKE HAZEN

I also want to thank you for your continued diligence. Our nation has entrusted us to do work that requires protection of sensitive assets, and with your help, we are going to honor our commitment with innovation, communication, and engineered controls that effectively and efficiently integrate the needed level of security into Sandia's work.

As part of the activity, you gave us a good perspective of how we can better partner with you. You made it clear that you take security seriously but want it to fit seamlessly into your work. By proactively working together, we're making changes that will help us embark on a future of partnership, innovation, and success. The following article is a continuation of what I hope will be a valuable partnership.

I ask that you continue to give us feedback by visiting our website or emailing security@sandia.gov. We will continue to share what we've learned and how we're working to improve security for you. We're listening!

Michael Hazen, c*hief security officer*
and VP of Infrastructure Operations

Feedback in action

Based on your feedback, Security is working hard to make improvements throughout the Labs. This includes focusing on the areas with the greatest risk and reducing unnecessary burdens on the workforce. Improvements so far include the following:

- Cyber Security has reminded line personnel to return their classified passwords to their Classified Administrative Specialists for proper storage.
- Protective Force Officers at Gate 10 now ask if individuals entering Technical Area I have controlled articles with them.
- Colored badge holders are being ordered, making it easier to determine clearance levels at a glance.
- "Code of the day" was discontinued.
- The Security website and Manager Toolcart were updated with new items to support the line.
- More stories, best practices, and tools are available on the new Security website.

The Security Incident Management Program (SIMP) and the Assessments Program are smoothing the security event process, and planning a Lean Six Sigma event to identify other process improvements.

Other improvements are also under way. Security is placing a significant focus on making it easier for the workforce to get help. One initiative that's already in the works is a Security call center that personnel can phone for live help with security questions. An entity email account, security@sandia.gov, is also now available for questions and feedback.

Based on numerous customer requests for assistance, an integrated security team was formed, which will be available on demand to provide security support for line organizations.

Performance Assist Reviews will also be implemented to analyze work processes and protect the Labs from risk. These reviews identify specific behaviors that need to be practiced routinely to reduce recurrent errors. A pilot review, started in FY11, has identified a systemic issue that is already being addressed Labs wide.

In FY12, Security is continuing to implement changes, reducing the number of non-value-added security requirements whenever possible, and focusing attention on higher-risk concerns. Security's footprint will continue to be reduced through development of a classified virtual library and destruction of legacy classified materials. Finally, Security will continue to use your feedback to implement changes that will help the workforce. *— Security Communications team*

Sandia Logistics earns coveted Quality recognition

By Nancy Salem

A New Mexico Quality Award is hard to come by. It's even harder to earn one on the first try.

Sandia's Logistics Operations did both and then some. It leapfrogged over the first Quality level, Piñon, to receive the Roadrunner Recognition.

"It is not that common for first-time applicants who apply at the Roadrunner level to achieve Roadrunner Recognition," says Jeff Weinrach, director of the New Mexico Quality Awards program. "We congratulate this organization on its significant achievement and look forward to them continuing to improve their performance."

The New Mexico program is modeled after the Malcolm Baldrige National Quality Award and recognizes organizational performance based on seven Baldrige criteria: leadership, strategic planning, customer and workforce focus, measurement, analysis and knowledge management, operations focus, and results. The Roadrunner level acknowledges significant progress in building sound and systematic processes and attaining improved organizational outcomes.

The Logistics organization is part of Supply Chain Management Center 10200, which started its quality journey in 2003 when the first of several Supply Chain groups received ISO 9001 certification.

Roy Fitzgerald (10260), senior manager of Logistics Operations, was manager of that first Supply Chain organization, and says his current group's effort to improve performance began two years ago with achieving ISO 9001. Under ISO, an organization's management systems and structures must meet specific criteria and quality standards.

LOGISTICS OPERATIONS senior manager Roy Fitzgerald says his group embraced the Quality vision because "we know right now we can't continue to do business as is."

"That laid the foundation," Roy says. "It established a mechanism by which management can regularly receive and assess performance and continually improve."

Logistics then stepped up its work in the Lean Six Sigma, a continuous improvement methodology modeled after Lockheed Martin's LM21 program, developing tools and techniques to eliminate waste from processes and better understand customer needs and expectations. "Over the past several years we made it a point to encourage and support the training and certification of new Lean Six Sigma green belts and black belts in my organization and train the management team on the eight forms of waste," Roy says.

Lean Six Sigma led to Quality New Mexico and the Baldrige framework for performance excellence. "About a year ago, Quality New Mexico came out and reviewed our operations and we worked with one of their folks to assess where we had gaps relative to the Quality criteria," Roy says. "We used that feedback to identify gaps and opportunities for improvement. We worked on those diligently over the course of a year while collecting and developing an application packet."

The application was filed in July, and Quality New Mexico announced in November that Logistics had received the Roadrunner Recognition.

Since Quality New Mexico was started in 1994, 190 organizations have received Roadrunner Recognition, 472 the lower Pinon Recognition, and 12 the top-level Zia Award. Weinrach said a handful of Sandia organizations have received Quality recognitions over the years.

Jeff Hunter (10260), a leader in the Logistics Quality effort along with Keith Austin (10693), says the key to success was focusing on performance from the customer's perspective. "We asked, 'How well are we performing now? What do customers expect from us? How can we change or improve our services or systems to better meet customers' needs?'" he says. "We make sure we can meet or exceed the level of service our customers need and expect."

ANTHONY LEYBA (102611) works in the shipping group in Logistics Operations. Quality New Mexico scored the organization high in workforce safety and security performance.

Logistics used focus groups to better understand what its customers expected and how well the group was performing. It also used data from customer satisfaction surveys and help desk call logs. "We developed a suite of measures that allowed the organization to assess how well our processes were working, and continued to eliminate waste, improve functions, and engage customers," Roy says.

Logistics moved from a function-based to a process-based approach to doing business. "We developed an understanding of the core processes and how those support our customers and align with strategy and where we wanted to go as an organization," Roy says.

Roy, who credits the entire Logistics team of 140 with the success, says his group embraced the Quality vision because "we know right now we can't continue to do business as is."

"We have to work smarter and more efficiently, given budgetary constraints and the economic environment we face," he says. "We want to do that and at the same time continue to improve performance and customer satisfaction."

Roy and Jeff say Logistics, which is responsible for numerous tasks surrounding deliveries, mail, shipping, packaging, property management, reutilization, and transportation at the Labs, will continue the Quality program. Jeff says the group will develop a more systematic approach to strategic and operational planning as well as benchmarks to measure performance against competitors and best-in-industry.

The Logistics team will be honored at the 2012 Quality New Mexico awards ceremony April 3-4 at the Marriott Albuquerque Pyramid North.

"In the end, it's not about awards," Roy says. "It's about taking advantage of opportunities to improve."

TVC president seeks deeper collaboration with Sandia

By Nancy Salem

John Freisinger knows a thing or two about baking. At his parents' popular sweets shop, he made a mean chocolate cake. Candy, too.

As president and CEO of Technology Ventures Corp., Freisinger looks at technology transfer with the eye of a chef.

"In the traditional model, TVC waited for technologies to come out of Sandia fully baked," he says. "I want to find the raw ingredients and tell industry what's in the pipeline. We want to say, 'This is what's available.' Tell us what you're interested in and we can start to help you craft what might look like a business around it."

TVC is a nonprofit founded and funded by Lockheed Martin to help commercialize Labs technologies to benefit the US competitive effort. Freisinger succeeded Sherman McCorkle, who headed TVC for 18 years.

Freisinger says his goal is to forge a tighter connection with Sandia and its work. "The integration has to be more consolidated," he says. "Industry has requirements. The world needs innovative solutions and big companies are looking for what's next. Many might be sitting right behind the Gibson gate."

The technologies might be there but also might not be ready to be commercialized and acquired by big firms. Technology needs to mature and the risk need to be removed. The most efficient mechanism to do that is a small business focused on a specific product for a specific market niche, Freisinger says.

That's where TVC steps in. Free of charge, its staff helps tech entrepreneurs build business models that can be funded by venture capitalists and other investors. It offers training programs and workshops as well as business-plan coaching and help with finance, patents, accounting, and funding. TVC's signature event is the annual Equity Capital Symposium that brings together tech startups with investors.

Since its founding in 1993, TVC has helped raise $1.17 billion in private-sector funding and launch 112 companies employing 12,550 people. Success stories include Emcore, a fiber optics and photovoltaics company founded on Sandia technology and sold to a New Jersey firm; and Altela, a water desalinization/decontamination company headed by former Sandian Ned Godshall.

"If you can productize the technology, make it into something useful in the commercial environment, and show the market risks are lower for adoption of the technology, it's more likely a big company will come in and acquire it," Freisinger says. TVC must become better at understanding what the capabilities are all over Sandia and feed that back to industry, entrepreneurs, and the venture community, he says.

TECHNOLOGY VENTURES CORP. CEO John Freisinger at TVC headquarters in Albuquerque. (Photo by Randy Montoya)

Mark Allen (1931), manager of IP Management, Alliances & Licensing, says Sandia is interested in deploying its intellectual property in support of its missions for the public good. "Sandia has enjoyed a long and productive relationship with TVC," Mark says. "Personally, I am excited to work with John as we explore new and innovate ways for Sandia ant TVC to team to achieve even greater impact."

TVC works with all the labs in the nuclear energy complex and receives some DOE and other federal funding. In the case of Sandia, Lockheed Martin is required by contract to fund TVC. "The goal is to create high-growth companies here with high wages for as many people as possible," Freisinger says. "Sandia and TVC are economic drivers to the community."

Freisinger is a self-described Air Force brat and "seminative New Mexican." His father flew C-130 rescue for the Air Force for 25 years, retiring in Albuquerque four years after being posted to Kirtland Air Force Base.

Freisinger, who was born in Sacramento and lived in 10 cities before the family settled in New Mexico, went to St. Pius High School and UNM. His parents, Jack and Sharon, built a successful retirement business, the Specialty Shop on Lomas Boulevard, doing cake decorating and candy-making. "Mom was a domestic goddess and dad learned cake decorating. They became master chocolatiers," Freisinger says. He and his two siblings took turns working the store. "I'm quite good," Freisinger says, smiling. "I can decorate cakes and make chocolate."

At UNM, Freisinger majored in economics and Russian studies, graduating in 1990. The Berlin Wall was down and glasnost had arrived. "Anybody with any background in Russian studies was being recruited to go to Russia for commercial enterprises," he says.

Freisinger was in the executive training program at Hyatt Hotels and getting offers to work in Russia. He packed his bags and signed on with Coca Cola in a work-study program through the University of Arizona.

Freisinger traveled back and forth for about two years before deciding it wasn't the life for him. He returned to Albuquerque in 1993 and took a series of high-tech jobs, a couple of which were with small startups. He worked for boards of directors as a turnaround specialist. "It was terrible," he says. "The first thing you do is fire people."

He looked for something that would let him help businesspeople before they got into trouble, and joined TVC five years ago as a project manager. He moved into fundraising and, when McCorkle announced he was retiring, raised his hand along with several other candidates for the top job. Freisinger got it.

"Lockheed Martin made the choice," says McCorkle, chairman and CEO of the Sandia Science & Technology Park Development Corp. "I'd use four words to describe the attributes John brought that Lockheed seeks: knowledge, imagination, savvy, and enthusiasm."

He carries those traits into his life outside work. In addition to baking, Freisinger is a master carpenter and holiday decorator whose home at Christmastime is a sightseers' destination. He and his wife, Shelly, and twin 11-year-olds, Elizabeth and Michael, are involved in sports, church, and other community activities.

At TVC, Freisinger's strategy is long-term, to nurture homegrown companies that will create jobs and wealth.

"We do a good job of helping the entrepreneur. But there are many resources within the Lab we are yet to be aware of that we can help more fully," he says. "There are more technologies to be pulled out and spun into entrepreneurial companies. There is more work to be done with the big guys to understand what their requirements are. That's heavy lifting. We now have the tools in place."

Sandia monitors nuclear safety of mission to Mars

By Stephanie Hobby

NASA'S MARS SCIENCE LABORATORY SPACECRAFT, sealed inside its payload fairing atop a United Launch Alliance Atlas V rocket, clears the tower at Space Launch Complex 41 at Cape Canaveral Air Force Station in Florida.
(Photo courtesy of United Launch Alliance)

The Mars Science Laboratory is just beginning its eight-month journey to Earth's neighbor after a successful launch Friday, Nov. 26, but for the past five years, a team of Sandia engineers has been working behind the scenes to ensure its smooth launch.

NASA's $2.5 billion MSL rover, the largest and most sophisticated vehicle to visit the Red Planet, is powered by a multi-mission radioisotope thermoelectric generator, or MMRTG. The generator turns heat from the decay of 10.6 pounds of plutonium dioxide into 110 watts of electricity to move the rover and run a suite of 10 instruments, which can do things like find water 32 feet below the surface and analyze chemical composition of rocks three car-lengths away.

While the MMRTG significantly increases the rover's range and lifetime from previous rovers, which relied on solar panels, launching nuclear material requires diligent attention to safety, and Sandia has been tasked with the tremendous responsibility of conducting the safety analysis report. Since 2006, Sandia engineers have analyzed millions of combinations of potential scenarios to ensure risks to people, animals, and the environment were minimal as the Atlas V rocketed out of Earth's atmosphere.

The first time the US launched a nuclear battery was on a satellite in 1961, less than eight weeks after Alan Shepard became the first American in space. Every launch of nuclear material since requires DOE to perform and write up a rigorous safety analysis, which is then sent to the Office of the President for final launch approval. Sandia was selected by DOE in 2006 to conduct the safety analysis for MSL and all future nuclear missions.

RON LIPINSKI at his Radiological Control Center console at Kennedy Space Center. (Photo courtesy of Bart Bartram of Tetra Tech NUS, Germantown, Md.)

"We look at the probabilities of all the different accidents that could happen. Because each event can happen at a particular time and a different way, we simulate the trajectory of a launch. There are parameters that represent those times and ways, and we randomly select each of these every time we run the code. We run the code more than a million times, so we build up a large statistical database," says Ron Lipinski (6223), team leader for Sandia's safety analysis report. Ultimately, Sandia provides probabilities of risk to decision makers. Sandia does not make the decision to launch.

Built with safety in mind

The MMRTG is built with safety in mind. The marshmallow-sized plutonium pellets are encased in four layers of iridium and graphite, designed to withstand heat from a fire or reentry. Plutonium-238 dioxide was a deliberate choice; the alpha particles it gives off can be stopped by a sheet of paper. In fact, about the only way it could pose a health risk is if it's ground into fine particles and inhaled. It is manufactured in ceramic form, and if something goes wrong, it is designed to break into large chunks, which would drastically minimize environmental hazards.

While the risk of a launch failure is small, and the chance of any plutonium being released is even smaller, accidents do happen, so the model simulates anomalies in every part of the launch sequence, including rocket trajectory, accident times, explosions and fires, debris impact, and orbital reentry. The team uses the Launch Accident Scenario Evaluation Program (LASEP) to analyze how the plutonium-powered generator would respond to a given incident. Sandia's experts in blast and impacts, fire and thermal, reentry dynamics, health physics, atmospheric transport, and contamination work together to develop a robust picture of any potential risks.

In the event of an explosion, the blast and subsequent impacts could damage the fuel and its casings, so one team was focused on running hundreds of scenarios over the course of several years to understand how the fuel and fuel containment structures would react.

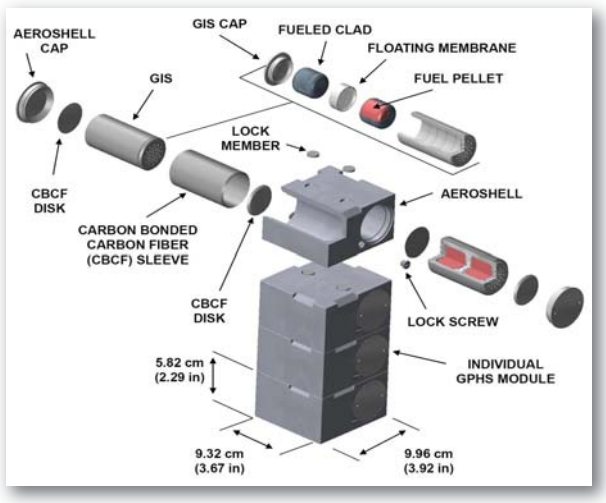
"We track how much plutonium-238 would be released and what form it would be released in, should there be a blast or impact. We then provide that data to LASEP, which combines many different scenarios to perform its calculations," says team leader John Bignell (6223), who came to Sandia from NASA's Jet Propulsion Laboratory, where he did structural analysis for the rover suspension and chassis. "It's pretty amazing to think that something you had direct contact with ends up on another planet, and I was excited to get the opportunity to continue working on this project when I came to Sandia."

A long history of testing

Launching something as large as the MSL required tons of rocket fuel, so fire is another hazard, particularly in the first 50 seconds after launch, when the rocket is still relatively close to Earth. Tim Bartel (6223) led a team to analyze the risks of high temperatures on nuclear cargo, either from an explosion or accidental reentry of the rocket.

"Liquid propellant makes a big explosion, but it's over quickly and doesn't really do much damage. Solid propellant is different. It's reliable and provides the extra thrust needed, but it can cause a really hot-burning environment, and the temperature can reach 3,000 Kelvin, which is hot enough to vaporize plutonium and present health hazards," Tim says. "Sandia has a long history of testing and characterizing burns, and we do thousands of calculations over the course of several years to better understand and mitigate those risks."

All of those calculations are used to determine the



EXPANDED VIEW of the MSL battery, which includes plutonium dioxide pellets. Sandia conducted the safety analysis for the nuclear material.

source term analysis, which is how much plutonium could be released to the atmosphere and the particle size distribution. "We are trying to analyze things that rarely happen, and we dig into the details of those rare occurrences. Then we have multiple layers of people looking at those results because of the high level of scrutiny and the possible impacts to the public. So we have to do a good job and show that we do a good job, too," says Daniel Clayton (6223), team lead for the source term analysis.

Nathan Bixler (6223), who also conducts safety analysis for commercial nuclear reactors, led the team to understand consequences, including how the release could be transported by wind and how it would affect the public. He used Daniel's analysis and combined that with historical meteorological data, which is considered to be a good indication of future weather patterns.

GREG LUCAS, part of Sandia's safety analysis team, stands in front of the countdown clock at Kennedy Space Center.
(Photo courtesy of Greg and Ray Lucas)

"The chance of an accident is low; even lower is the chance that plutonium would be released, and the chance that human health could be affected by an accident is fractions of a percent," Nathan says. "If an accident were to happen, we calculate that a little over a square kilometer would be contaminated which is likely to be confined to Kennedy Space Center and the Cape Canaveral Air Force Station, and could be cleaned up without any impact to the surrounding area."

A few members of the Sandia team went to Florida for the launch; Ron was part of the Radiological Control Center at Mission Control, which included representatives from NASA, DOE, Lawrence Livermore National Laboratory, and state and local agencies in Florida, to do rapid response in case of an accident.

Sandia will monitor the safety of future missions, and the team is thrilled to be a part of this effort. Greg Lucas (6223) was hired after an internship with the group, and this is his third year with the program. "It's a great project to be a part of so early in my career," Greg says. "It's nice to know that your analysis does help this launch proceed, and you feel that you have a part in making the MSL mission happen."

"This is an opportunity to be part of history, and to be a part of this mission is wonderful," says Ron. "We've gotten some tremendous insights into other planets, as well as our own. It's very exciting."

Computer-driven holiday light display dazzles, delights, enthralls

By Adriana Gronager

Note: Adriana Gronager was a student intern in Dept. 3601 last year. She wrote this story about her family's annual holiday lighting display at the request of the Lab News.

Clark Griswold may have new competition from John Gronager (5900) and his traditional holiday light display. With a total of 1,488 channels, which synchronize an estimated 23,000 light bulbs to holiday music, John creates an outburst of holiday bliss throughout his family's yard.

John's inspiration for the holiday light display began at an early age when he and his parents decorated the outside of their house for the holidays. Once John began a family of his own, he and his wife, Georgia Gronager (10654), made it a holiday tradition to decorate both the inside and outside of their home.

"We started decorating the house with just a few light strings and a couple of rows of luminarias. The kids seemed to really enjoy it and Georgia thought the lights made the house look beautiful. I began to add more and more lights as the years went on," John says.

John quickly came up with the idea of synching the bulbs to holiday music after a tenant from his rental house sent multiple pictures of a light display they had created for Halloween, noting that all of the lights were synched to music.

Over the next year, John assembled a controller for 16 channels, created a design, and connected the bulbs. He then selected traditional holiday music and programmed a controller for each song. In December 2008, John presented his first holiday light display to the neighborhood.

"The responses from the neighbors were great! Families came up to me and thanked me for my holiday spirit. Before I knew it, cars began to line up and down the street," John says.

Since John's holiday light display began to attract a lot of traffic, he decided to put out a collection box for donations that would benefit the Joy Junction foundation.

John says, "Joy Junction is a worthy charity that supports our community." The first year I created the light display, I heard that Joy Junction was having a few donation issues. That's when I thought, why not help those who help others?"

Address: 1504 Gray Rock Pl. N.E. • Times: Daily, 5-10 p.m. • Music broadcast over 99.9 FM.

John says he hopes that his holiday light display gives his audience a sense of joy and happiness while they prepare for the holidays. As for the future of the light show, John wants to eventually see his holiday display captured on Google Earth.

Guided bullet

(Continued from page 1)

bullet to the marketplace.

Researchers have had initial success testing the design in computer simulations and conducting field tests of prototypes, which can be built relatively inexpensively using commercially available parts, Red says. The project was started with funding from the Laboratory Directed Research & Development program.

THE TINY FINS along the sides of the four-inch-long self-guided bullet steer the projectile to its target.

While engineering issues remain, "we're confident in our science base and we're confident the engineering-technology base is there to solve the problems," he says.

Sandia's design for the 4-inch-long bullet includes an optical sensor in the nose to detect a laser beam on a target. The sensor sends information to guidance and control electronics that use an algorithm in an eight-bit central processing unit to command electromagnetic actuators.

ON TARGET — From left to right, Marc Kniskern (5422), Scott Rose, James "Red" Jones, Jim Woods, and Brian Kast (all 6531) brought together a variety of expertise to design a self-guided bullet to help war fighters. (Photo by Randy Montoya)

These actuators steer tiny fins that guide the bullet to the target.

Most bullets shot from rifles have grooves, called rifling, that cause them to spin in order to fly straight, like a football thrown in a long NFL pass. To enable a bullet to turn in flight toward a target and to simplify the design, the spin had to go, Red says.

The bullet flies straight due to its aerodynamically stable design, which consists of a center of gravity that sits forward in the projectile and tiny fins that enable it to fly without spin, just as a dart does, he says.

Computer aerodynamic modeling showed that the concept would result in "dramatic improvements" in the bullet's accuracy, Red says. Computer simulations showed an unguided bullet under real-world conditions could miss a target more than a half mile away (1,000 meters away) by 9.8 yards (9 meters), but a guided bullet would get much closer, to within 8 inches (0.2 meters), according to the patent.

Plastic sabots provide a gas seal in the cartridge and protect the delicate fins until they drop off after the bullet emerges from the firearm's barrel.

The prototype does not require a device found in guided missiles called an inertial measuring unit, which would have added a lot to its cost. Instead, the researchers found that the bullet's relatively small size when compared to guided missiles "is helping us all around. It's kind of a fortuitous thing that none of us saw when we started," Red says.

As the bullet flies through the air, it pitches and yaws at a set rate based on its mass and size. In larger guided missiles, the rate of flight-path corrections is relatively slow, so each correction needs to be very precise because fewer corrections are possible during flight. But "the natural body frequency of this is 30 hertz, so that means we can make corrections about 30 times per second. That means we can overcorrect, so we don't have to be as precise each time," Red says.

Testing has shown the actuator performance is promising and the bullet can reach speeds of 2,400 feet per second, or Mach 2.1, using commercially available gunpowder. The researchers are confident it could reach standard military speeds using customized gunpowder.

A nighttime field test using a tiny light-emitting diode, or LED, attached to the bullet showed the battery and electronics can survive flight, Red says.

Researchers also filmed high-speed video of the bullet radically pitching as it exited the barrel. The bullet pitches less as it flies down range, a phenomenon known to long-range firearms experts as "going to sleep." Because the bullet's motions settle the longer it is in flight, the rate of inaccuracy is less at longer ranges, Red says.

"Nobody had ever seen that, but we've got high-speed video photography that shows that it's true," he says.

The bullet could have uses for the military, law enforcement, and recreational shooters.

Sandia researchers who helped Red and Brian develop the technology are: engineer Brandon R. Rohrer (6533), aerodynamics expert Marc Kniskern (5422), mechanical designer Scott Rose (6531), firearms expert James Woods (6531) and Ronald Greene (5416), a guidance, control and simulation engineer.

"It was one of the coolest things I've ever worked on," Red says. "I worked with a great bunch of people who are incredibly bright, incredibly motivated, and who solved a great array of problems. It was awesome."

New hires

(Continued from page 1)

communicate as best we can with our employees to give them ample opportunity to understand what that means to them from a personal perspective," Karen says. "We did that with our retirement changes."

The Labs' aging workforce is another reason for the retirements, Karen says.

KAREN GARDNER

Transferring the knowledge of one workforce to the next is important for Sandia's workforce planning and accounts for some of the recent hiring, she says.

Sandia's managers look at the work they have and determine whether they have employees with the skills needed to accomplish their work and meet their commitments over the short and long term, Karen says.

"We have hired forward for the right skill set for the Labs, so those individuals can work in tandem with the people who have been here for a very long time for knowledge transfer and business continuity," Karen says. "When folks retire, we can carry on without missing a step."

It's not an accident that Sandia's employee numbers overall are remaining stable. Sandia performs deliberate, ongoing assessments to meet a full range of workforce requirements in close collaboration with key customers, DOE, NNSA, and Sandia's leaders. Sandia is hiring to ensure we have the right capabilities to carry out the future work we will do for the nation, while maintaining affordability and attention to the changing demographics of the workforce, Karen says.

Human Resources' data also show that 170 people (not including retirees) voluntarily left the Labs in fiscal year 2011. The figure represents about 1.6 percent of the workforce and is extremely low compared with other large employers in certain regions of the country, Karen says.

"Sandia is such a great place to work, our researchers are finding solutions to the toughest problems the nation can give us, and our hiring practices are such that we are bringing in the right talent. These are people who can meet these challenges and who want to live where we have labs."

Climate change, unchecked, could be factor in conflict between peoples, says Sandia Climate Security lecturer

By Neal Singer

The windiest day in recent memory blew about 100 Sandians into Bldg. 810 last week to hear noted University of Washington atmospheric science professor Thomas Ackerman give a wide-ranging talk on climate change. He discussed alterations already observable in today's climate, as well as why cloud simulations formerly difficult to model have become less so, and problems likely to arise with attempts to intentionally reverse climate variations rather than alter the conditions producing the unwanted change in the first place.

In the question-and-answer period following the talk, he discussed the difficulties of dispersing meaningful climate data to those who request it, and the famous Photoshopped image of a polar bear marooned in Arctic waters on a drifting cake of ice.

Ackerman, also director of UW's Joint Institute for the Study of the Atmosphere and Ocean, served for six years as chief scientist of DOE's Atmospheric Radiation Measurement (ARM) program, the largest ground-based atmospheric observing program in the world. He pioneered the use of millimeter-wavelength radar for cloud studies, serves on the science teams of two NASA satellite observing systems, and last week was named an American Geophysical Union Fellow.

'Physics doesn't lie'

"He has worked with Sandians on many occasions," says Rob Leland (1400), program director for the talks, the fifth in Sandia's Climate Security Program lectures intended to explore possible dangers and opportunities in changes of climate. The audience, in addition to Sandians, included students teleconferencing from the University of Texas at Austin.

The climate news, Ackerman said, isn't good. "Humans have been adding GHGS [greenhouse gases] to the atmosphere at an ever increasing rate," he said. "Physics doesn't lie: The result will be a warmer world."

Offering examples of what that means in global terms, he said that in Tarawa Atoll in the south Pacific, fresh water that exists naturally in a thin near-surface layer on the atoll is in process of being overrun by rising salt water. This is killing plants and trees whose roots relied on the small fresh water layer. The atoll is the capitol of the Republic of Kiribati.

In Odisha (formerly Orissa), an Indian state, higher temperature means decreased crop yields, increased intensity of cyclones, and increased variability of monsoon rains; in Africa's sub-saharan Sahel region, it adds environmental stress to an area already stressed; and in Togiak, Alaska, it significantly reduces snowfall within the lifetimes of native peoples and keeps ice from forming in a bay that used to freeze till May.

Will hit developing world hardest

"Climate change will hit the developing world the hardest," Ackerman said, "stressing marginal environments and creating the potential for human migration, political conflicts, and war."

While he noted scientific expectation that by 2100, Earth's climate will have risen 2 to 4 degrees and sea level rise will be on the order of a meter — "maybe larger"— he then moved to explain successful efforts to lessen the widely recognized problem that, as he put it, "Uncertainties are everywhere in global climate predictions."

He gave a nod to the effect of aerosol particles on climate, which by blocking sunlight might be masking some of the warming due to greenhouse gases. But the major cause of divergent simulations, he said, were the varied attempts to handle cloud formation.

"If we change climate, how does that modify cloud properties, and how does that feed back into climate?"

Because reducing climate change uncertainty as it pertains to national security is of interest to Sandia (and the focus of Sandia's Climate Security program), Ackerman was able to work with systems engineer Mark Ivey (6913).

"I told him what I wanted and he told me what I could have," Ackerman joked.

He sent out microwaves and laser beams, and measured incoming radiation to determine cloud radiative effects.

"We're starting to get a handle, after 10 years of trying, on the accuracy of our cloud models," he said, using robustness and distinctness of cloud profiles.

He described a painstaking effort to gather actual cloud data in Darwin, Australia. The tests involved collecting moisture data eight times daily on seven vertical levels for a period of ten months over a specific area. Other cloud test data have been collected as well, he said, at other locations around the world, with a noticeable improvement in the accuracy of models.

He moved into the third and last phase of his lecture by asking, "What if our climate models get better, our simulations of global and local climate change improve, our uncertainties are coming down, our knowledge of the physics is getting better, but we don't change our behavior?"

This would require major changes in government policies and investment, which are "not occurring and are unlikely to occur any time soon."

Greenhouse gas emissions can be represented by this equation, he said: <population x gross domestic product x energy consumption x economic efficiency x the amount of carbon-based fuel used>.

"Thus, our only options are to increase efficiency or reduce the use of fossil fuels."

Such changes would involve "dozens of new nuclear power plants, huge developments of wind and solar farms, strict efficiency codes and standards, drastic upgrades in car and truck fuel efficiencies, development of carbon capture and storage, and it all has to be done in the next 20 to 40 years."

Failing this, the other option open to humanity is geoengineering, "the evil twin on the horizon," as he put it. Processes suggested include making low-level clouds brighter by adding sea salt particles to the air, which would nucleate more water droplets and thus, more reflection. Other ideas include chemical air scrubbers ("no working system, expensive, and we'd need lots of them"), and reducing solar radiation by hoisting mirrors into space.

Manipulation, not management

"This is manipulation, not management, because management implies we know what we're doing," he said.

(There was not a single cough, rustle, or comment heard by the *Lab News* from the audience during the entire talk. A number of researchers rested their chins on their raised palms in the classic "thinker" position. Sandians must make an ideal lecture audience.)

He found ethical as well as practical issues to deliberate climate modification. "Do we have the right to deliberately modify global climate? Who is the 'we?' Who pays if things go wrong? Who speaks for future generations? How do we manage risks when we don't know what the risks are?"

Concerning governance, he said, "What international structures are appropriate for governing global climate intervention? How do we define damages? Who compensates?"

He gave a lengthy example of induced climate change in the Arctic satisfactory to Russia but not to China, and an arctic consortium that didn't agree to take certain steps that either nation wanted.

"Who gets to set the global thermostat? The Chinese want cooling, the Russians want warming, and the Bangladeshians want something else.

"We are going to be unprepared for this situation [of deteriorating ecosystems, human starvation, and likely armed conflict] because climate observing systems are not being maintained, US climate research programs are being attacked… as redundant and unnecessary, funding is disappearing, and we have no national strategy.

"I don't know how to convince people that if you add CO_2 [carbon dioxide, a greenhouse gas emitted by burning fossil fuels] to the atmosphere, it's going to warm. I think we are putting our heads in the sand, leading from the rear, and complaining all the way."

Concerning a question about requests from others to examine data from his experiments, he said, "There's a tremendous amount of work that needs to be done. I want to give the data up and let the chips fall where they may, even though people may cherry pick the data and misuse it, but it's not that simple. How must I release it? I give someone one-millimeter radar data and they say, 'Can't you put this into a form that means something?' How much of my life am I supposed to put in to putting this into different forms that various people want?"

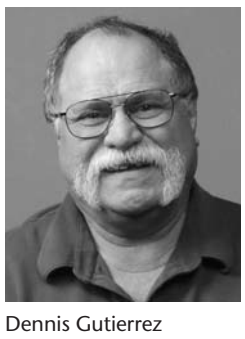
Answering another questioner, he disavowed the use of Photoshopped pictures of a polar bear marooned on a tiny ice flow.

First snow of season impacts Labs

THE FIRST SNOWFALL OF THE SEASON roared into Albuquerque in early December, riding on the back of near-hurricane force winds and arctic temperatures. Various locales around the metro area received between 1 and 6 inches of snow, forcing the closure of schools, businesses, and government agencies. Sandia called for a two-hour delayed start on Monday, Dec. 5; with deteriorating conditions, employees who were able to show up for work that day were released early. By Tuesday morning, most employees were able to report to work as usual. Above, Robert Naranjo (4848) braves the cold to clear snow from the walk in front of Bldg. 811 on Monday, Dec. 5. (Photo by Randy Montoya)

Recent Retirees

New Mexico *photos by Michelle Fleming*
California *photos by Randy Wong*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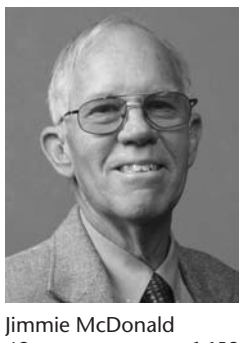
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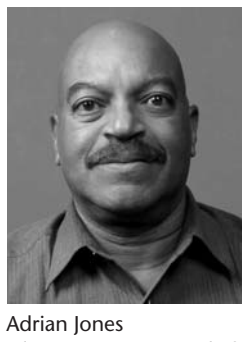
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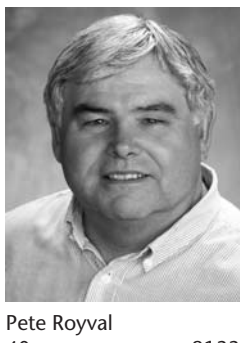
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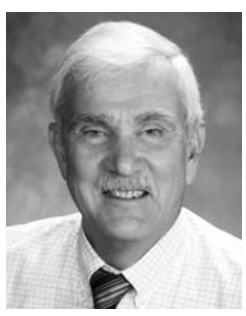
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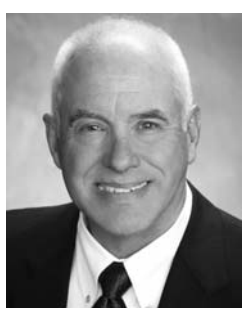
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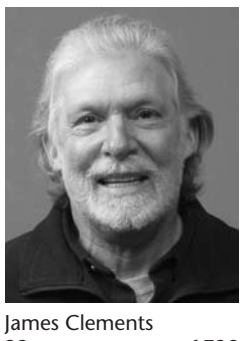
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Steve Goods
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Thomas Gutierrez
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Larry Demo
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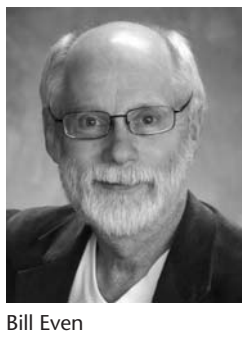
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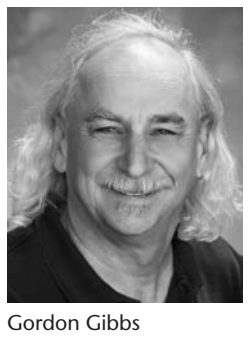
Gordon Gibbs
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Steve Hatch
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Kurt Olsen
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Chris Robertson
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Glenda Ross
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T.J. Allard
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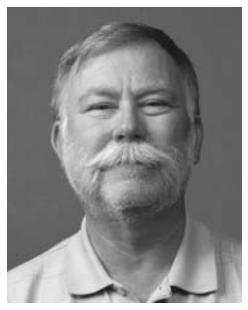
Jim Berry
31 8949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William Holub
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Jeff Lenberg
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Hal Morgan
31 1930


Michael Orrell
31 2130


Ron Diegle
30 2624


Greg Foltz
30 8114


Tracey Lamee
30 8949


Shawn Mooney
30 5351

Duane Schneider
30 1132

Steven Yearout
30 5733

Don Charlesworth
29 8511

William Houf
29 8365

Dale Walker
29 8231

Recent Retirees

For more retiree photos and Milepost photos, see next page

Recent Retirees

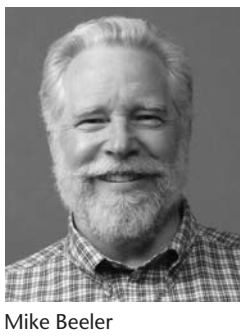
New Mexico *photos by Michelle Fleming*
California *photos by Randy Wong*

Randy Creighton
28 1126

John Freshour
28 4142

Joe Henfling
28 6916

Amy Martin
27 1464



Mike Beeler
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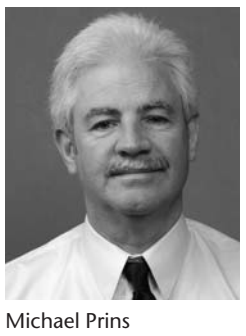
John Ledwith
26 2700

Sandra Lormand
26 8944

Kathryn Olson
26 9532

Mark Vaughn
26 6916

Rosalie Lopez-Spinello
25 2734



Michael Prins
25 5564

Karen Scott
25 162

Ruth L. Smith
23 1100

Carl Axness
21 6225

Sandy Smallwood
18 3333

Linda Sickles
18 410

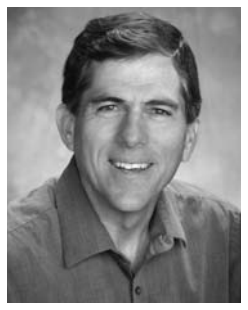
Ellen Wilsey
13 10661

Frank Paulic
10 421

Mileposts

New Mexico *photos by Michelle Fleming*
California *photos by Randy Wong*

Edward Talbot
35 8960



Ken Black
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Larry Schneider
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Paul R. Smith
30 4879

Red Jones
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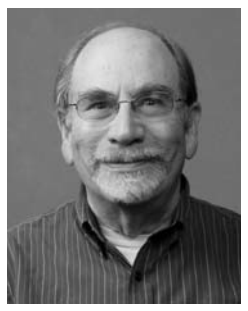
Dennis King
25 6916

Chris Lanes
25 5349

Mike McDuffie
25 3654



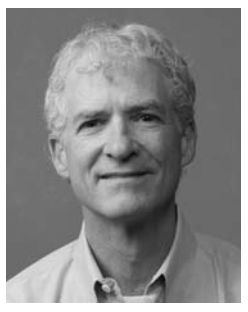
Richard Shagam
25 2624

Randy Shul
25 1746

Frank Trowbridge
25 2732

Paul Vianco
25 1831

Bill Boling
20 4237



Mark Davis
20 99

Larry Luna
20 411

James Miller
20 1815

Miriam Minton
20 6612

Stephen Montague
20 5644

Dwight Stockham
20 4144

Nita Uriarte
20 2212

Patrick Xavier
20 6134

Steven Yesner
20 5419

Jennifer Clark
15 8135

Kristen Valdez
15 5944

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

CLASSIC HEAD SKIS, black, 2-pr., 7-ft., 6'9", 50 yrs. old, decorate den or powder ski, make offer. Vook, 884-4754.

BASKETBALL HOOP & CAR, Little Tykes, $15, ea.; Kettler tricycle w/push bar, $65; First Act drum set, $30. Pena, 271-5222.

LUMINARIAS, to benefit Holy Ghost Catholic school, $8/dz. delivered. Maestas, 459-7650.

REFRIGERATOR, black, 20.5-cu. ft., 67" x 32" x 31", freezer on bottom, ice maker, manual, ~10 yrs. old, $200. Potter, 610-9933.

ELLIPTICAL TRAINER, ProForm SpaceSaver, pre-programmed routines, folding base, excellent condition, w/floor mat, $350 OBO. Keller, 264-2787.

SNOWBOARD BOOTS, new, youth, Liquid, size US 6, $45; BMX bike frame, Junior XL Intensive, $100; carbon fiber bike fork, $50. Brewster, 238-4704.

CAMERA, Casio Exilim EX-Z70, 7.2 MP, compact, works great, does photo & video, $45. Chang, 385-6158.

IN-LINE SKATES, California Advanced Sports ZX600, youth size 3-6 adjustable, w/elbow, wrist, knee pads, all brand new, $25. Nelson, 856-5505.

SNOWBOARD BOOTS, men's, size 10, Morrow, black, very little wear, almost new, $25. Eller, 417-4390.

VACUUM, Royal metal 3000, upright, w/attachments, $75; girl's bike, 24-in., Mountain Track, w/Barbie bell, excellent condition, $75. Strauch, 803-6805.

PROJECTOR, Kodak Carousel 4200, unused, in box, $125. Thompson, 298-8954, robertt12500@comcast.net.

RECLINER, La-Z-Boy, heat, vibrate, velour, teal, excellent condition, $165. Willmas, 281-9124, ask for Jack or Deborah.

VACUUM, Dyson DC25 Ball, 1 yr. old, excellent condition, $250. Lichlyter, 505-323-2773.

ANTIQUE DRAFTING TABLE, oak base w/cast iron, top refurbished, $375 OBO. Whitlow, 321-6670.

TREADMILL, Vision Fitness Premier, ~$2,000 new, asking $650. Esterly, 296-9759.

PROFESSIONAL HOME THEATER, 9 Magnapan speakers, 4 subs, 10 components w/rack, projector, screen, cost $25,000, asking $5,000. Richter, 896-9534.

JEWELRY CABINETS, standing, QVC, new, $90; bicycle, Aquila, 52 cm, MSRP $1,295, Shimano Tiagra STI, $500. Malcomb, 294-6975.

DINING TABLE, Southwestern, white washed, 5-ft., w/6 matching chairs, upholstered in Southwest fabric, good condition, $200. Finley, 293-1961.

POOL TABLE, Brunswick, 8-ft., felt replaced 1 yr. ago, table rarely used, excellent condition, $1,000 OBO. Serna, 505-615-5371.

TIRES & WHEELS, 4, 31X10.50X15, Goodyear Wranglers & 5 Jeep Canyon wheels, ~50% tread, $500. Wolf, 856-8539.

COLOR TV, Panasonic model CT32011E, 32-in., w/remote & unused digital converter, great buy, $100. Mooney, 294-5161.

TIMESHARES, 2, Jan. 21-28, 2012, great locations, studio units, partial kitchens, sleeps 3, $70/night. Herrera, 239-8545.

BEAD & TAPESTRY LOOM, Mirrix, 22-in., complete, like new, $280. Ayers, 505-349-1793.

SEWING MACHINES — Singer 500A & 503A vintage, all metal gears, heavy duty, nice, $150 ea. Vigil, 505-792-0180.

SPEAKERS, 1-pr. Klipsch, 3-way, Heresy II floor standing loud speakers, medium oak finish, excellent condition, $200. Bickel, 822-0951.

RADIAL ARM SAW, 10-in., Craftsman Professional, $175. Obrien, 400-1564.

PRE-LIT LED CHRISTMAS TREE, Sylvania, 7-ft., 300 mini lights, 52-in. wide, never used, $80. Wagner, 881-4840.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:

- **EMAIL: Michelle Fleming (classads@sandia.gov)**
- **FAX: 844-0645**
- **MAIL: MS 0165 (Dept. 3651)**
- **DELIVER: Bldg. 811 Lobby**
- **INTERNAL WEB: On internal web homepage, click on News Center, then on *Lab News* link, and then on the very top of *Lab News* homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.**

Ad rules

1. Limit 18 words, including last name and home phone (If you include a web or e-mail address, it will count as two or three words, depending on length of the address.)
2. Include organization and full name with the ad submission.
3. Submit ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active Sandia members of the workforce, retired Sandians, and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish any ad that may be considered offensive or in bad taste.

ROLLER BLADES, men's size 8, women's size 7, new-in-box, $30 ea.; dartboard, in wood cabinet, new, $45. Vigil, 400-0639.

CLASSICAL GUITAR, Cordoba 2000, model 50K, hard case, great Christmas gift, $800 new, $500 firm. Miller, 275-8154.

REFRIGERATOR, KitchenAid, 21.6-cu. ft., black, ice maker, excellent condition, $300. Smith, 797-9358.

WOOD SPLITTER, SpeeCo, 28 ton, $1,200 OBO; '97 Suzuki 1400 Intruder, $2,800 OBO; '02 flatbed, 16-ft., dual axel, rear brakes, $1,100 OBO. Rankin, 283-1790 or 238-9963.

LUMBER RACK, heavy-duty, for long bed truck $150; all-metal hydraulic dump bed, $1,500; both $1,600 OBO. Garcia, 280-5815.

MOVING SALE: Living room; dining room, bdr. furniture; wooden bar w/stools; yard tools; priced to sell. Behar, 831-5621 or 980-8002.

CONSOLE PIANO, Wurlitzer, w/bench, Scandinavian oiled walnut, 2nd owner, nice starter piano, $650 OBO. Peterson, 856-9629.

TRANSPORTATION

'03 FORD RANGER, Super cab, 5-spd., 4.0L V6, SuperLift, 35-in. Goodrich tires, bed liner, 100K miles, $8,300. Robertson, 319-7966, ask for Kyle.

'97 FORD F150, 2WD, single cab, w/camper shell, 154,544 original miles, $4,000 OBO. Gallegos, 379-6713.

'02 DODGE CONVERSION VAN, V6, white/tan, clean, upgrades, runs great, 90K miles, $4,000 OBO. Auble, 505-974-1090.

'97 BUICK PARK AVENUE, lots of power equipment, CD/cassette, recent service, garaged, 70K miles, $3,500. Geer, 505-203-5122.

'09 B1 TOYOTA 4RUNNER SR5, V6, 4WD, PL, PW, moon roof, AM/FM/CD/Satellite, tinted windows, 11,270 miles, excellent condition, $28,000. Post, 332-8247.

'06 MAZDA 6S GRAND SPORT, AT, leather, alloy, moon roof, 46K miles, good/excellent condition, $2,000 < Kelley Blue Book, $11,000. Blansett, 227-5280.

'03 PONTIAC VIBE, MT, 30/36-mpg (city/hwy), great commuter, 1 owner, detailed maintenance records, 67K miles, $7,500. Chan, 620-1625.

'04 BMW 330 Ci, SMG transmission, M-3 wheels, excellent condition, $13,500. Moore, 412-1584.

RECREATIONAL

'05 HOLIDAY RAMBLER IMPERIAL, loaded, 69K miles, excellent condition, RV only $169,995, RV & Saturn tow, $174,995. Godin, 259-0399.

KID'S POLARIS RIDING ATV, rechargeable batteries, $50; Dora 4-wheeler, $35; both great condition. Aboytes, 480-8906, ask for Adri.

REAL ESTATE

3-BDR. TOWNHOME, 2-3/4 baths, 1,964-sq. ft., 2-car garage, basement, newly remodeled, Morris/Indian School, FSBO, $165,000. Sondreal, 505-379-0690.

4-BDR. CUSTOM HOME, 2-1/2 baths, 2-car garage, large den & master bdr., great views, 5 mins. from KAFB, REC possible, $380,000. Bonham, 385-3565.

WANTED

ROOMMATE, share house w/29-yr.-old professional female, 3-bdr., 2 baths, near Constitution & Wyoming, $600/mo. Gallegos, 505-280-2198.

GUITARS, Parker Fly or Nitefly w/active piezo; Vox SSC-55. Battaile, 505-480-6177.

BED FRAME, fits queen or king mattress. Mathews, 922-6078.

FURNISHED STUDIO APT., along city bus line, January-March 2012, for female retiree currently living in Hungary. Wagner, szentes2002@yahoo.com.

WORK WANTED

HOUSE OR PET SITTING, for college student, past experience at local doggie daycare. Roberts, 275-2941.

American Chemical Society honors 2 Sandians

The American Chemical Society has named two Sandia researchers as Fellows of the society for their outstanding achievements in chemistry and important contributions to ACS, the world's largest scientific society.

Tina Nenoff (1114) and Ellen Stechel (6123) were among 213 scientists inducted as ACS Fellows during the society's recent national meeting in Denver. The society's board of directors created the ACS Fellows Program in December 2008.

TINA NENOFF

Tina is a distinguished member of Sandia's technical staff. Ellen is manager of the Concentrating Solar Technologies Department and program manager of the Labs' Sunshine to Petrol Program.

Tina, who has been with Sandia since 1993, conducts basic and applied research of novel inorganic materials for separation and waste forms, catalysis, and membrane applications. Her work has applications to such things as nuclear waste cleanup and developing cleaner, more energy-efficient chemical and petrochemical industry processes.

She describes the research as a sort of feedback loop. "We try to understand the structure property relationship on the nanoscale, then we extrapolate to bulk scale properties and applications and then feed back that information to optimize on the nanoscale," she says.

She received her master's and doctoral degrees in chemistry from the University of California, Santa Barbara, and her bachelor's degree in chemistry from the University of Pennsylvania.

Ellen joined Sandia in 1981 in the Condensed Matter Physics Department and managed the Advanced Materials and Device Sciences Department from 1994 to 1998. After a stint with Ford Motor Company, she was rehired at Sandia in 2005 on contract to the Department of Homeland Security to work on the technology development cycle from basic research to commercialization. In 2006, she formed a new Sandia department, Fuels and Energy Transitions, and in 2008 took up responsibilities on the Sunshine to Petrol project and managing the Energy, Climate, and Atmospheric Management Department. This year she became manager of the Concentrating Solar Technologies Department, which includes DOE's National Solar Thermal Test Facility (NSTTF), one of only two facilities in the world capable of testing full-size and prototype-scale concentrated solar power (CSP) components and systems.

She manages and develops such programs as concentrating solar power and producing sustainable liquid hydrocarbon fuels from concentrated solar energy and recycled carbon dioxide.

ELLEN STECHEL

Ellen earned a bachelor's degree in mathematics and chemistry from Oberlin College, a master's in physical chemistry and a doctoral degree in chemical physics from the University of Chicago.

"ACS is especially proud to honor these chemists during the 2011 International Year of Chemistry," society President Nancy Jackson, manager of Sandia's International Chemical Threat Reduction Dept. 6823, said in announcing the Fellows. "The work they are doing will improve all of our lives as they unleash the power of chemistry to solve global challenges like providing clean water, sufficient food, new energy sources and cures for disease."

— Sue Major Holmes

Sandia's mighty tree has a brighter and bigger star

By Iris Aboytes

Most of us have a beautifully trimmed Christmas tree gracing our homes. Garland and bells add beauty to its branches. Tiny lights sparkle and illuminate its warm invitation. The tree's crowning glory is a beautiful star that causes us to stop in its wonderment. It reminds us of Christmases long ago and renders expectations of Christmases yet to come. It has become a symbol of joy and happiness.

The tiny lights to Sandia's mighty but imaginary tree came from 500 school children. Because of the generosity of Sandians through the Shoes for Kids program, the students were able to get new school shoes. Just like our old collectible decorations, the program began more than 50 years ago by two scientists who decided to buy shoes for needy children instead of buying each other Christmas gifts.

The bells on the tree came courtesy of the more than 400 hundred Sandians who donated Christmas gifts to the New Mexico Children, Youth, and Families Department. In record time, dolls, trucks, and gift cards filled every available branch on the tree. More branches were needed to make room for the overflow. Imagine the smiles on the children whose lives are not as rich as ours. Hopefully each special gift will put a smile on a gentle face. Because of Sandians, many children will know there is someone out there who cares. Really cares, sight unseen.

The beautiful garland on this year's tree is courtesy of Sandians who donated 217 turkeys, food supplies, and money to feed those in need. Each hand held another, and the garland got brighter and longer as more than $20,000 was contributed. The community looks to Sandia to make a difference and Sandia is always there.

PATTY ZAMORA (3652) stands among the many gifts donated to CYFD by Sandians. (Photo by Rachel Baros)

The star on this year's tree has grown each year. This year's star was lit by almost 72 percent of Sandians who contributed $4.6 million to the United Way of Central New Mexico through Sandia's Employee Caring Program. Donations are still coming in, so that number could easily change. The star is the courtesy of not just the Sandia employees, but Sandia's secret weapon, Sandia retirees.

There are special decorations offered by many departments throughout Sandia. They have added their own special touch. Independently they have adopted families for the holidays. Their only wish is that their help will enable their adopted families to have as beautiful a Christmas as they themselves do. These decorations come in different shapes and colors as each department has its own emblem.

The gifts under Sandia's tree are for the Sandians. The more than 8,000 packages each has a different name. Each is filled with good jobs, work/life balance, benefits, and opportunities. The packaging is all individualized. There are no two the same, so look for yours. It is right there before your very eyes.

A former Sandia president once said, "Don't tell me what you know, until you tell me how much you care."

Mary Ann Sweeney is one of Sandia's woman pioneers

By Iris Aboytes

Mary Ann Sweeney (1610) rides her bicycle about 80 miles every weekend with her New Mexico Touring Society friends. That's not surprising to anyone who knows her. When she came to Sandia 37 years ago, Mary Ann and her husband, Ed Ricco, lived on base, and she roller skated to work. So nothing has changed, except now she does it all on weekends.

In late November, Mary Ann began a three-to four-month stint at NNSA as editor in chief for the FY 2013 Stockpile Stewardship Management Plan. Her objective is to ensure that the annual report to Congress is accurate and speaks in one voice, rather than in the voices of the roughly 100 contributors from laboratory sites and NNSA.

Mary Ann did theoretical and computational research in inertial confinement fusion, high energy density physics, pulsed power, and weapons science at Sandia until about 1995. Since then, her focus has been on management-related activities supporting the Pulsed Power Sciences Center and NNSA. From 2002 to 2004 she was at NNSA in Washington, D.C., preparing implementation and program plans for the Inertial Confinement Fusion Campaign and measuring the progress at the national labs on that effort.

ENERGY-CONSCIOUS — Back in the day, Mary Ann often roller-skated to work. (Photo courtesy of Mary Ann Sweeney)

Her favorite research project at Sandia was when she used a 3-D electron-photon Monte Carlo transport code to design radiation shielding for PBFA II, the Z accelerator's predecessor. "As a result of my simulations, a shield wall was built at the entrance to the basement alcove, and the computer was placed upstairs in a shielded screen room instead of in the alcove," says Mary Ann.

MARY ANN did theoretical and computational research in inertial confinement fusion until about 1995. Since then, her focus has been on management-related activities supporting the Pulsed Power Sciences Center and NNSA. (Photo courtesy of Mary Ann Sweeney)

Growing up

Mary Ann grew up in Mercersburg, Pa., a farming community of about 1,600 people. "I grew up at a time when most women, including my mother, didn't work outside the home," says Mary Ann. "But I didn't want to be a homemaker. I wanted a career."

The summer before her junior year in high school, the family moved to Baltimore, where her father believed his daughters would get a better education. "And he was right," says Mary Ann.

On the first day of class, the teacher told Mary Ann and another girl who entered his classroom, "You are going to cause trouble."

"He made us sit in the front," says Mary Ann. "I thought physics was really interesting and I wanted to become a physicist."

Mary Ann's father put her and her two sisters through college. "I thought guys were jerks back then, and I had difficulty with the change from a small town environment to a large city," says Mary Ann. "So, I went to Mount Holyoke, a women's college in South Hadley, Mass., and majored in physics."

She wrote her senior honors thesis on white dwarfs, very dense stars with a mass roughly that of the sun and in which nuclear fusion no longer occurs.

"At that time, I believed women could do anything," Mary Ann says.

Mary Ann earned a doctorate in astronomy from Columbia University. It was there, she recalls, where a male student told her she did not belong in graduate school and ought to be at home cooking and sewing. On another occasion, Mary Ann was told by a department chairman that, as a female, she would only find a job if her thesis focused on the kind of studies of galaxies that the astronomer Cecilia Payne-Gaposchkin had done. But Mary Ann's dream was to pursue her interest in white dwarfs, so she found a thesis adviser at Princeton.

Behind the big fence

It was at Columbia that Mary Ann met her husband, Ed, who was also an astronomy graduate student. He went on Air Force active duty and was assigned to Kirtland Air Force Base. Mary Ann found herself in Albuquerque with little interest in staying at home. She looked for science jobs in Albuquerque and Los Alamos. Ed suggested she look into the place right on the base that had a big fence around it, lots of parking lots, and was 12 blocks from where they lived. Not knowing anything about Sandia, Mary Ann wrote on the employment application that she was willing to do anything but secretarial work.

"I began working at Sandia in pulsed power in June 1974," she says. "The same principles that govern nuclear fusion and energy transport in stars apply to our efforts to create fusion in a pulsed power accelerator, except on a much smaller scale. My work at Sandia was not only challenging, but I became a contributor.

"I found out that the culture still had to catch up with the idea of a woman working in plasma physics," recalls Mary Ann. "I had worked at Sandia about a year and registered to attend the first in a series of conferences on high-energy electron beams. The invitation stated spouses should wear long ball gowns to the banquet.

"I informed my department manager that my husband was even willing to wear high heels if necessary. That pointedly shattered the assumption that all the scientists attending would be male."

For the banquet, Mary Ann wore the off-white wedding gown she had made.

"Just because I was in a job that was non-traditional at the time for a woman did not mean I couldn't cook and sew," she says.

When Ed completed his tour of duty, he attended law school at the University of New Mexico and is now a lawyer. Mary Ann found she enjoyed law school vicariously and thinks law might have been another career path for her. But she has remained a Sandian.

Mary Ann and Ed have two daughters, both of whom received Lockheed Martin National Merit scholarships. Alanna Sweeney, a Spanish theater major, is a merchandise planner for Kate's Paperie in New York City. Susanna Ricco, an applied math and computer science major, is in graduate school at Duke University working on her computer vision thesis.

Mary Ann, a Fellow of the Institute of Electrical and Electronic Engineers (IEEE), was the first female chairman of the IEEE Plasma Science and Applications Committee and the first female officer of the American Physical Society Division of Plasma Physics. She received an Alumnae Achievement Award from Mount Holyoke in 2007 for her multi-year role in encouraging women and minorities to pursue careers in science.

"I have wonderful stories of my life," says Mary Ann. "I believe that you should be given credit for what you do, whether you are a man or a woman. I love being part of Sandia's workforce."