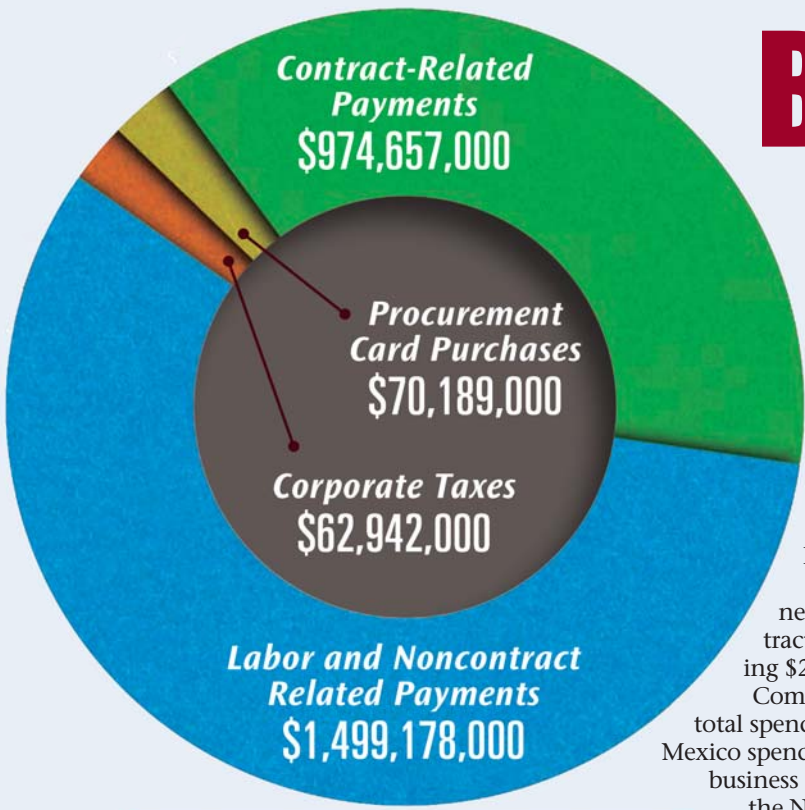

Total Laboratory Expenditures
$2,606,966,000

Business ally

Report spotlights Sandia's increasing economic impact

By Nancy Salem

Sandia spent roughly $975 million on goods and services in fiscal year 2013 and New Mexico businesses were awarded more than $420 million, or 43 percent, of the total, according to the Labs' latest economic impact report.

US small businesses received nearly $500 million in Sandia contracts, with the New Mexico share totaling $287 million, or 57 percent.

Compared with the previous fiscal year, total spending was up $79 million and New Mexico spending was up $19 million. Total small business contracts were up $27 million and the New Mexico share up $31 million.

"There is no question that 2013 was a very challenging year for the US economy and in particular for small businesses in New Mexico, California, and the entire country. Yet through it all, Sandia's overall spending increased $79 million," says Don Devoti, manager of Small Business Utilization Dept. 10222. "The economic impact of this increased spending has benefited small businesses in New Mexico and across our nation. Sandia's partnership with small and diverse business suppliers is key to the economic prosperity of New Mexico."

While Sandia spends a large portion of its funding in New Mexico, its economic footprint is thought to be much larger than the actual dollars it spends. Economic impact models suggest the effect Sandia has on New Mexico's economy could be about three times the total amount it spends on purchases and salaries.

Seeking small and diverse suppliers

Sandia reaches out to local businesses through a variety of programs. It holds public forums with suppliers and civic leaders to discuss contracting opportunities, and lists contracts on its Business Opportu-

(Continued on page 5)

Talent Acquisition Center offers new tools for recruiting and hiring

By Tim Deshler

The Talent Acquisition Center (Depts. 3554 and 3555) is making big changes to the recruiting and hiring process at Sandia.

Recent enhancements take advantage of new

technologies that make it easier for managers and recruiters to find, screen, and hire the best candidates. Changes include a new recruiting iPad app and iPad loan program, a more in-depth applicant screening program, virtual interviewing, and other new tools and resources.

Loaner iPads available

Campus recruiters and tech talk presenters can use Sandia's recruiting iPad app by downloading it from iTunes onto their iPad, or by borrowing an iPad from Recruiting and Student Programs. The Recruiting loaner iPads come fully loaded with Sandia recruiting collateral, along with the app. Users should be aware that security and use restrictions for the Recruiting iPads are different than standard-issue iPads.

The new Corporate Recruiting Presentation includes a comprehensive slide deck that recruiters and managers can customize for information ses-

(Continued on page 4)

Inside . . .

Hydrogen fuel cell unit powers Honolulu port 3
VP Jill Hruby talks threat reduction at AAAS meeting . . 4
Yifeng Wang: Asian American Engineer of the Year . . 5
Marlene Brown: New Mexico Woman of Influence . . 8
My life as a mystery writer and police volunteer 8

Sandia LabNews

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Sandia National Laboratories

Cargo-security partnership wins national tech transfer award

TEAM LEAD John Dillinger (5628) tests the security of a cargo container. He says the national FLC partnership award reflected the efforts of more than 100 Sandians from nine centers. (Photo by Randy Montoya)

By Nancy Salem

Sandia and two collaborators won the national Federal Laboratory Consortium's 2014 Interagency Partnership Award.

The award recognizes agency and/or laboratory employees from at least two organizations who together did outstanding work in transferring technology. The winning partnership included Sandia, the Space and Naval Warfare Systems Command (SPAWAR) Systems Center Pacific (SSC Pacific), and the Department of Homeland Security (DHS) for the development of cargo container security technologies.

The team developed, tested, evaluated, and transitioned new cargo security technologies to meet specific DHS and Department of the Navy requirements. Since 2001, DHS has been required to secure the storage and transportation of cargo entering and traveling through the United States against terror

(Continued on page 4)

That's that

News from the fusion front: Researchers at Lawrence Livermore National Laboratory's National Ignition Facility have reported in *Nature* that they have achieved a breakthrough in the ongoing quest to attain sustainable fusion, which many consider to be the Holy Grail of energy sources: clean, safe, and with enough potential fuel (seawater) to power the needs of the planet for the foreseeable future.

In its approach, the research team used NIF's 192-laser array to compress a deuterium/tritium fuel pellet in such a way that the resulting fusion reaction yielded more energy out of the fuel core than went into it. It should be noted, though, that only a very tiny fraction of the lasers' energy actually reached the fuel core.

Sandia Pulsed Power Sciences Center Director Mark Herrmann congratulated the research team, but added a cautionary note. In a largely upbeat and optimistic commentary in *Nature* accompanying the Livermore paper, Mark wrote: "Perhaps the biggest question is: Will ignition be achievable at the NIF? The answer is uncertain. Funding agencies and scientists want to know, and only time and more experiments will tell whether that will be possible. This is frequently where we who work in fusion find ourselves, facing significant obstacles but encouraged by scientific advances such as those of Hurricane [lead author of the *Nature* paper] and colleagues."

Sandia researchers using the Z machine are also pursuing fusion using electromagnetic energy to drive their experiments. A bit behind the Livermore team, Sandia's researchers recently have made notable, incremental progress toward sustainable fusion, learning much along the way. And around the world, other research teams are on the same quest. It's far from clear which technical approach will ultimately deliver the goods – it could be Z – but there is optimism in the community that they are closing in on the goal. The director of the Princeton effort, one of the best-funded and most highly visible fusion programs, was quoted in news reports about the Livermore breakthrough as saying "In 30 years, we'll have electricity on the grid produced by fusion energy – absolutely. I think the open questions now are how complicated a system will it be, how expensive it will be, how economically attractive it will be."

By the way, both NIF and Z are funded by NNSA to support the stockpile stewardship program; the insights these teams are gaining about fusion processes help advance our understanding of the physics at the heart of nuclear weapons. The energy implications of this research are a bonus, you might say, but a bonus with potential immense payoffs down the road.

I feel bound to add my own cautionary note: The rap on fusion is that, as the saying goes, "Fusion is 30 years away . . . and it always will be." But you know, given the strides being made by researchers from Livermore and Sandia and Princeton and elsewhere, maybe we really are within a generation or so of seeing this long quest completed.

* * *

Have you been watching the Olympics? Are you as astonished as I am by how close the competitions are at the very highest levels? I mean, in the downhill ski event, for example, after racing down a dizzyingly steep run for almost two miles, maybe a second separates the winner from the 10th-place finisher. What differentiates a gold medalist from someone you never heard of? Less than the blink of an eye.

With those kinds of margins, the athlete has become just the tip of the spear; the front-line SpecOps soldier backed up by an incredible logistics organization. A highly specialized technical team of doctors, aerodynamicists, materials experts, nutritionists, kinesthesiologists, meteorologists, nuclear physicists (okay, not sure about that one), and who knows what else, spend their working lives trying to help the athlete find an extra couple of hundredths of a second. Bottom line, of course, is that it's up to the athlete to execute, but clearly, sport and science and engineering are, more than ever, joined at the hip, exploring the outer limits of human performance.

Have you noticed how, every four years (well, every two now) we all become instant experts in the nuances of half-pipe snowboarding, ice dancing, biathlon, and curling(!), tossing off words like triple toe loops, amplitude, sideslip, and fall line? Speaking of special lingo, here's a phrase from the figure skating world we could use at Sandia during the performance evaluation process: Kiss and Cry – that's the area next to the rink at major competitions where the skaters wait to get their results.

See you next time.

– Bill Murphy (505-845-0845, MS1468, wtmurph@sandia.gov)

Sandia summer interns eligible for short-term leases in KAFB housing

Labs employees qualify for longer-term leases on base

KIRTLAND FAMILY HOUSING

Sandia employees and summer interns are eligible for on-base housing at Kirtland Family Housing. Enjoy the safety and convenience that comes with living on an Air Force installation.

Special for summer interns: Two- and three-bedroom homes in the Pershing Park subdivision are available and include all utilities. Application and security deposit will be waived. These homes can be applied for online at www.kirtlandfamilyhousing.com.

For summer interns, it is important that on the application, under the "Unit/Squadron" heading, the words "SANDIA INTERN" are added. This is the only way a three-month lease will be possible.

For more information, contact Kirtland Family Housing at 505-232-2049.

Retiree deaths

Joseph Ambrulevich (82) . . . . . Oct. 5
Ruby Cruz (98) . . . . . Oct. 11
Drucilla Summey (90) . . . . . Oct. 15
Gwen Pullen (59) . . . . . Oct. 19
Jacob Young (69) . . . . . Oct. 20
Joe A.Ochoa (84) . . . . . Oct. 22
Leonard Storz (60) . . . . . Oct. 25
Lynn Tyler (78) . . . . . Oct. 31
James Leeman (82) . . . . . Oct. 31
Donald Kuehl (78) . . . . . Oct. 31
Ruth Cowham (89) . . . . . Nov. 3
Paula Asturias (93) . . . . . Nov. 4
Howard Cilke (84) . . . . . Nov. 5
Celso Sanchez (79) . . . . . Nov. 7
Joseph Treml (85) . . . . . Nov. 8
Robert Miller (77) . . . . . Nov. 9
W Kenneth Paul (77) . . . . . Nov. 12
Amado Chavez (83) . . . . . Nov. 13
Ronald Hayenga (87) . . . . . Nov. 15
Richard Allen (80) . . . . . Nov. 18
Harley Walker (90) . . . . . Nov. 21
George Duke (89) . . . . . Nov. 22
Jerry Slusser (89) . . . . . Nov. 22
Marion Young (91) . . . . . Nov. 22
Alfred Riedel (age 80) . . . . . Nov. 29
Gloria Atencio (66) . . . . . Dec. 6
Kent Johnson (89) . . . . . Dec. 8
Robert Hannigan (87) . . . . . Dec. 13
Donald Lloyd (85) . . . . . Dec. 14
Mary Abieta (69) . . . . . Dec. 14
Howard Stuart (86) . . . . . Dec. 15
Gabriel Chavez (84) . . . . . Dec. 15
Charles McKinney, Sr (76) . . . . . Dec. 16
Jane Lord (94) . . . . . Dec. 17
Betty Lacher (90) . . . . . Dec. 18
Paul Gaither (89) . . . . . Dec. 19
Helen Agats (93) . . . . . Dec. 24
Thomas Cook (87) . . . . . Dec. 27
James Stueber (89) . . . . . Dec. 27
Louise Weston (66) . . . . . Dec. 27
Marie Vaughn (86) . . . . . Dec. 29
Margaret Coy (61) . . . . . Dec. 30
Thomas Merewether (68) . . . . . Dec. 31
Marcella Florez (78) . . . . . Jan. 3
Frank Truby (89) . . . . . Jan. 6
Leo Doyal (76) . . . . . Jan. 8
Jack Hudson (66) . . . . . Jan. 9
Clauncey Matthews (79) . . . . . Jan. 13
Benjamin Armijo (86) . . . . . Jan. 17
Darrell Munson (80) . . . . . Jan. 17
Louis Kerschion (79) . . . . . Jan. 18
William Guntrum (92) . . . . . Jan. 22
Joseph Doyle (82) . . . . . Jan. 23
Robert Devore (90) . . . . . Jan. 24
John Jewell (70) . . . . . Jan. 25
Richard Duran, Jr. (88) . . . . . Jan. 28

Sandia LabNews

Sandia National Laboratories

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Portable, self-contained hydrogen fuel cell unit to power Port of Honolulu for six months

Deployment project builds on earlier study's optimistic results

By Mike Janes

Clean hydrogen power that's expected to lower emissions and reduce energy consumption will be coming to the Port of Honolulu in 2015 after the completion of a new fuel cell technology demonstration, one that could lead to a commercial technology for ports worldwide.

The work comes on the heels of last year's study and analysis that confirmed the viability of hydrogen fuel cells to provide auxiliary power to docked or anchored ships. Hydrogen researchers at Sandia have joined with several partners in the follow-up project, which will result in a portable, self-contained hydrogen fuel cell unit that can float on a barge, sit on a dock, or be transported to wherever it's needed to provide electrical power.

Ports have been a major source of water and air pollution in the US but remained relatively unregulated until recent years. As ports have begun to expand and their impact on the environment has become more apparent, port operators face a variety of regulations. Many ports have begun to enact sustainability goals or adopt green practices, and that's where fuel cells can play a role.

"No one has ever built this kind of custom unit for this purpose," says Joe Pratt (8366), who serves as project manager. The unit, he said, will fit inside a 20-foot shipping container and will consist of four 30-kilowatt fuel cells, a hydrogen storage system, and power conversion equipment.

The system will be delivered to and deployed by Young Brothers, Ltd., one of the project partners and a primary shipper of goods throughout the Hawaiian Islands. The unit is undergoing detailed engineering and design through mid-2014 and, after fabrication, assembly, and training for Young Brothers operators, will be operational during a six-month deployment in early 2015. Young Brothers, the project's demonstration partner, is a subsidiary of Foss Maritime Company, a shipping firm that has strong environmental and financial interests in the project.

The Hawaii project is jointly sponsored by DOE's Office of Energy Efficiency and Renewable Energy (EERE) and the Department of Transportation's Maritime Administration (MARAD).

Optimism abounds after earlier study

After conducting a study of various west coast ports in 2013, Sandia analyzed Young Brothers' shipping operations in more detail. Like many operators, the company uses diesel engine generators to provide power to refrigerated containers.

"We compared the efficiencies of their diesel engines versus fuel cells, studied the energy efficiencies at various power levels, and estimated the savings and reductions in emissions that would be realized if they were to convert to a fuel cell-powered operation," says Joe. Analyses have shown that when generators are frequently producing less than maximum power, such as in the Hawaii application, the efficiency advantage of fuel cells compared to the combustion engine is widened, he says.

Though the study had to make some assumptions (the purchase price of hydrogen, for instance), it determined that Young Brothers could save fuel, energy, and, at the same time, enjoy greatly reduced emissions if it switched primarily to fuel cells.

With promising study results and a shipping partner, Young Brothers, to serve as an early adopter and operate the fuel cell system for six months, EERE and MARAD are funding the Hawaii demonstration. The project's other partners include Hydrogenics Corp., which will design and build the prototype unit and supply the fuel cells, and Hawaii Natural Energy Institute, which will provide assistance with hydrogen supply issues.

Other stakeholders include the US Coast Guard and its local Sector Honolulu office and the American Bureau of Shipping. These organizations have regulatory authority over the design and operation of the prototype and see the project as a way to assist their development of formal regulations for hydrogen and fuel cells in the maritime environment. They, along with the DOE's Hydrogen Safety Review Panel, will review the safety aspects of the design and operating plans.

Future deployments and other ports

In addition to its project management role, Sandia is providing technical expertise in hydrogen and fuel cells, particularly in the area of codes and standards, system design, safety systems, data collection and analysis of both operations, and the business case for deployment.

Following the six-month deployment of the fuel cell system, Joe says the project team will analyze the project's successes and challenges, including the operating and cost parameters needed to make a business case at other ports.

The long-range goal, he says, is to develop a commercial-ready technology that can be widely used at other ports. The project team sees a strong market need and desire for a fuel cell solution, not only at maritime ports but also for other applications such as providing power to users that are not connected to an electric grid.

Sandia CaliforniaNews

CLEAN HYDROGEN POWER that's expected to lower emissions and reduce energy consumption will be coming to the Port of Honolulu in 2015 after the completion of a new fuel cell technology demonstration, one that could lead to a commercial technology for ports worldwide. The technology will help ports meet new regulatory and sustainability goals.

Threat reduction

Jill Hruby speaks at AAAS annual meeting about Sandia effort to avoid technological surprise

By Heather Clark

Threats of terrorism and weapons of mass destruction don't seem as imminent today as they did after terrorists flew hijacked planes into the World Trade Center towers and the Pentagon and crashed in a Pennsylvania field, but scientists, industry, and universities working on technological solutions to national security challenges must anticipate what could come next.

"Even when the public is not feeling a sense of danger, national security research facilities like Sandia still need to be on the job, anticipating what's going to happen and avoiding technological surprise from those who wish to harm the US," says Jill Hruby, VP of International, Homeland, and Nuclear Security Div. 6000.

Jill discussed Sandia's role in this national security effort, recent research, and future challenges in her talk, "Mitigating the Chemical, Biological, and Radiological Threat," part of a Feb. 16 symposium, Discovery and Innovation in Science and Engineering Security Technologies, at the American Association for the Advancement of Science (AAAS) 2014 Annual Meeting in Chicago.

"Even when the public is not feeling a sense of danger, national security research facilities like Sandia still need to be on the job, anticipating what's going to happen and avoiding technological surprise from those who wish to harm the US."
— Div. 6000 VP Jill Hruby

After 9/11, the US Department of Homeland Security was created and Sandia and others brought science and technology to bear on an intense national effort to respond to threats of terrorism, particularly those using weapons of mass destruction. But in an environment of lower public interest — due, in part, to the success of early efforts to combat terrorism that resulted in fewer major incidents in subsequent years — continued collaboration between national security laboratories, academia, and industry is needed, Jill said.

Jill oversees Sandia's work on nonproliferation and arms control, securing and safeguarding nuclear weapons and nuclear materials, protecting critical US government assets and installations, and reducing the risks to the nation of terrorist threats and significant national incidents, while maintaining and facilitating trade, travel, and personal freedoms.

Since 9/11, she has seen the need for:

• Detecting radiological and nuclear sources in shipping ports, airports, and even the belts of first responders.

• Decontaminating large areas after biological events. Decontamination foam developed at Sandia before 9/11 was used to clean up federal office buildings and mailrooms after the 2001 anthrax attacks.

• Protecting the nation's critical infrastructure and rapidly responding to natural or terrorist acts.

• Detecting explosives in transportation systems, at public events, or in wartime.

• Providing guidance to the global community on more effective security practices for biological, chemical, and radiological materials.

Future challenge to anticipate risks, responses

The US can best prepare for future threats by creating solutions using multidisciplinary technical skills and a systems approach to show where the most critical vulnerabilities are, Jill said.

"In the years after 9/11 many of the 'easy' problems were solved, enhancing our security, but also leaving the US with the more difficult systems-level problems to address," she said. "At the same time, the risks will continue to increase and change quickly, so we need to think ahead as much as possible so our federal systems can respond."

Looking ahead, the national security research community will need to balance sustaining current systems with the necessity of improving technologies and responding to new threats, Jill said.

Sandia's technological contributions also must address everyday threats by providing the ability to detect terrorist acts. For example, equipment to detect illegal drugs also might detect radiation sources. Or, public health officials must have tools that can recognize a public health threat, while also providing evidence on whether a biological terrorist attack occurred, she said.

In addition, Sandia's technology often is licensed by industry, expanding its uses to benefit the public. Examples include:

• Decontamination foam is now being licensed by industry to decontaminate illegal methamphetamine labs.

• A Sandia-developed diagnostic tool, SpinDX, quickly detects biological agents, like anthrax, ricin, botulinum, and other toxins, and companies have licensed the technology for medical applications to more quickly diagnose and treat patients with more common diseases.

Talent acquisition

(Continued from page 1)

sions, tech talks, and other recruiting events. The slides market the major advantages of working at Sandia (Sandia's employment value proposition) and have been cleared through Sandia's corporate Review and Approval (R&A) process.

Campus recruiters and hiring managers say they're pleased with the new Recruiting Event Screening Form (RESF), which guides discussions at recruiting events to help assess whether a prospect would be a good fit for Sandia. Following a recruiting event, completed forms are entered into PeopleSoft. Hiring managers can then view the forms and identify candidates already vetted by a Sandia recruiter, permitting more efficient use of recruiting efforts across the Labs.

The Talent Acquisition Center processes incoming resumes from recruiting events and sends a follow-up email to prospects, reinforcing Sandia's employment value proposition and inviting candidates to apply for opportunities online. The email contains a link to Sandia's Careers website and encourages candidates to sign up to receive emails when new job openings in their career fields are posted.

HR staffing partners have begun screening applicants' resumes for open positions to ensure applicants meet the minimum qualifications of the job posting before forwarding their resumes to hiring managers for consideration. To support this effort, staffing partners work directly with the hiring manager early in the process to get a clear understanding of the job's specific requirements. Feedback on this service has been quite positive.

When managers are ready to begin the interview process, the Hiring Process Guidelines and Interview Wizard are available to help. The Hiring Process Guidelines puts useful interviewing and hiring information at managers' fingertips, and the Interview Wizard includes behavioral questions organized by "Sandia Success Factor" categories. For fast and easy interview preparation, managers can select their questions, filter, print, and go.

Since it was launched in October, managers can now interview remote candidates via Virtual Video Interviewing (VVI), which provides a convenient way to conduct screening interviews with remote candidates without having to arrange travel. VVI is available through computer kiosks in private conference rooms in the IPOC Talent Acquisition Center. Where permitted, managers can set up VVI capabilities on their desktops by following simple instructions on the Talent Acquisition and Onboarding website. Using VVI saves time, reduces costs, and uses technology to entice talented prospects to Sandia.

All of these tools and resources can be found on Sandia's Recruiting and Student Programs website, available through the new Leader Resource Center (go to TechWeb>>Lab Info>>Leader Resource Center>>Talent Acquisition and Onboarding>>Recruiting and Student Intern Programs). While there, managers who participate on recruiting teams can also check out the Recruiter wiki, which contains additional information and links. Through the wiki, users can submit recruiting trip reports, share best practices, document contacts, and more. All of these improvements ensure efficient use of managers' time and improve Sandia's branding with candidates.

FLC award

(Continued from page 1)

attack, introduction of contraband cargo, and pilferage. And the Navy must ensure the security of high-value cargo, such as munitions, that it stores and transports around the world on a 24-hour basis.

The research done under the partnership resulted in five invention disclosures and four US patent applications.

John Dillinger (5628) and Steve Morrison (6531) led the project for Sandia. The same partnership was also recognized last fall with an FLC Outstanding Regional Partnership Award, one of five Far West/Mid-Continent regional awards received by Sandia.

"Congratulations to John, Steve, and their entire team for winning both regional and national FLC awards for this important work to secure our borders," says Jackie Kerby Moore, manager of Technology and Economic Development Dept. 7933 and Sandia's representative to the FLC. "It's very exciting when Sandia is recognized alongside our partners for successful technology development and commercialization."

John says the project started in late 2004 and that more than 100 Sandians from centers 1500, 1800, 5300, 5600, 6400, 6800, 8000, 9000, and 10000 worked on it. "All their efforts contributed to this award," he says. "Steve and I believe the award represents the character this project has had since its inception. We see it as years of contribution by a large number of Sandia staff and their collaboration with vendors, DOE laboratories, SPAWAR, and sponsor DHS Science and Technology Borders and Maritime Division.

"The goal was to enhance US air, land, and maritime border security through the transition of scientific and technical knowledge, ultimately providing standards and solutions for the global supply chain industry. The team's challenge from day one was to enhance security and improve the flow of commerce."

The FLC is a nationwide network of more than 300 members that provides the forum to develop strategies and opportunities for linking laboratory mission technologies and expertise with the marketplace.

The FLC Awards Program annually recognizes federal laboratories and their industry partners for outstanding technology transfer efforts and has become one of the most prestigious honors in technology transfer. Since its establishment in 1984, the FLC has presented awards to nearly 200 federal laboratories.

"We are thrilled to have won this partnership award with SPAWAR SSC Pacific and DHS," Jackie says. "Partnerships with government, academia, and industry are crucial to Sandia's efforts to deploy technology for the public good."

Yifeng Wang selected Asian-American Engineer of the Year

By Neal Singer

Yifeng Wang (6222) has been selected by the Chinese Institute of Engineers/USA to receive the Asian American Engineer of the Year (AAEOY) award for 2014.

The award annually recognizes "American individuals of Asian descent who have made exceptional contributions to the field of Engineering, Science, and/or as a Corporate Leader."

Since 2002, some 180 corporate executives, managers, engineers, and researchers from leading US technology corporations, research institutions, and the US Armed Forces have received the AAEOY award, including seven Nobel laureates.

Yifeng was nominated by Sandia executive VP Kim Sawyer for "pioneering contributions to nanogeochemistry, nonlinear geochemistry, and environmental material development and sustained contributions to backend nuclear fuel cycle research."

YIFENG WANG has been selected to receive the Asian American Engineer of the Year (AAEOY) award for 2014. (Photo by Randy Montoya)

"This is a very real honor and I am thrilled by the selection. I would like to thank my colleagues and managers for their support and encouragement over the years," Yifeng says.

Yifeng, who grew up in a small village in China, came to the US in 1988 and became an American citizen in 2001.

"For those like me who came to the US at that time, each person has his or her own interesting story," he says. "Mine is that when I first arrived in Bloomington, Indiana, as a visiting student I barely spoke English. I communicated with my graduate advisor mostly through writing in a notebook. Additionally, China and the US were so different. The cultural shock was huge."

Yifeng earned a PhD degree in geochemistry from Indiana University in 1993. "I was lucky to have a chance to join the Indiana group, which was working on geochemical self-organization studies. The concepts I learned there, such as nonlinear dynamics and system complexity of Earth systems, have influenced my career in many ways."

After working a year and half at the Georgia Institute of Technology as a postdoctoral student, Yifeng joined Sandia in 1995. In the course of his 18-year career at Sandia, he became known for the broadness of his geological research interests, which span nanogeochemistry, biogeochemistry, early Earth evolution, environmental materials, and geologic repository science.

A pioneer in nanogeochemistry, he was the first to demonstrate the effect of nanopore confinement on mineral-water interface chemistry and gave this new research field its name: nanogeochemistry.

"Sandia is a good place for idea hybridization," he says. "Nanogeochemistry is a hybridization of geochemistry with nanoscience. Interestingly, the concepts we developed turned out to be quite useful for nuclear waste isolation and shale gas research."

At DOE's Waste Isolation Pilot Plant (WIPP), Yifeng conceived and developed an innovative concept that used magnesium oxide to sequester microbially generated carbon dioxide and, additionally, to control WIPP disposal room chemistry. The concept proved critical to the EPA's ultimate approval of WIPP. Magnesium oxide, in use since WIPP opened, is still the only engineered backfill in the WIPP repository design.

"WIPP is the first project in which I was involved at Sandia," Yifeng says. "It was great for a fresh-out-of-school graduate to see his contribution become an integral part of a prominent engineering project, such as WIPP. This is another benefit of working at Sandia, where science and engineering come together naturally."

Yifeng, a distinguished researcher in geoscience engineering, is the technical lead for the DOE Used Fuel Disposition Crystalline Disposal R&D Work Package. He coordinates dozens of technical staff across eight national laboratories and other research organizations for this project. He's also the principal investigator of an LDRD project involving shale gas disposition and release. He has published more than 80 peer-reviewed publications and has six patents issued or pending.

He will be joined by other recipients to receive the award at the AAEOY Award Ceremony on Saturday, March 1, in San Francisco.

Economic impact

(Continued from page 1)

nities website. It supplies small and diverse business owners with information on doing business with Sandia and seeks qualified suppliers.

The 2013 Sandia National Laboratories Economic Impact report breaks down Sandia's spending and spotlights its role in the economy. The 2013 data reflecting actual payments made is based on Sandia's fiscal year from Oct. 1, 2012, to Sept. 30, 2013. The report demonstrates Sandia's continued commitment to small business.

Here are some numbers showing Sandia's overall economic impact in 2013:

- $1.5 billion was spent on labor and non-contract-related payments.
- $974.6 million went to contract-related payments.
- $59.3 million went to the state of New Mexico for gross receipts taxes.
- $70.1 million was spent through procurement card purchases.

DON DEVOTI, manager of Small Business Utilization Dept. 10222, says Sandia's commitment to small business continues to grow. (Photo by Randy Montoya)

The Small Business Act mandates that federal contractors use small businesses, including those that are small disadvantaged, owned by women or veterans and service-disabled veterans, and small businesses in impoverished areas — called Historically Underutilized Business (HUB) zones. The Small Business Utilization Department oversees the mandate and negotiates small business subcontracting goals with NNSA.

"Sandia continues to have very aggressive goals for small business and supplier diversity this year," Don says. "My small business team and our entire procurement organization are committed to meet and/or exceed these goals and to continue making a difference to New Mexico's economy. We will continue to engage, value, and partner with our supplier community."

Sandia's total small business expenditures for fiscal year 2013 with New Mexico and California breakouts

	National	New Mexico	California
Total small businesses:	$499,317,000	$287,070,000	$55,451,000
Woman-owned small businesses:	$104,888,000	$79,239,000	$10,890,000
Businesses in impoverished areas (HUBZone):	$14,141,000	$5,133,000	$146,000
Small disadvantaged business (SDB)	$138,634,000	$118,278,000	$7,960,000
Business owned or co-owned by socially and economically disadvantaged person 8(a):	$33,583,000	$27,171,000	$128,000
Veteran-owned small businesses:	$62,155,000	$17,428,000	$5,282,000
Service-disabled, veteran-owned small businesses (SDVOSB):	$21,016,000	$6,104,000	$3,767,000
Small business (non-minority, non-woman, non-veteran owned)	$124,900,000	$33,717,000	$27,278,000

"Sandia National Laboratories has a long and distinguished record of encouraging and partnering with highly qualified, diverse small business suppliers who assist us in achieving our national security mission. We are fully committed to continuing this track record."

— Sandia President and Laboratories Director Paul Hommert

Partnerships promote national security

Sandia President and Laboratories Director Paul Hommert echoes the Labs' full support of the Small Business Act. "Sandia National Laboratories has a long and distinguished record of encouraging and partnering with highly qualified, diverse small business suppliers who assist us in achieving our national security mission," he says. "We are fully committed to continuing this track record."

Sandia also helps the state's economy through the New Mexico Small Business Assistance (NMSBA) program, established by the state Legislature in 2000 to help companies receive technical support from the Labs. In 2012, the Sandia NMSBA provided nearly $2.4 million in technical assistance to 196 New Mexico small businesses in 27 counties. Since 2000, it has provided more than $24 million in assistance.

Sandia employees gave more than $5.6 million in 2012-2013 to the United Way of Central New Mexico as the largest corporate contributor to the agency. That number topped $6 million in the 2013-2014 Employee Caring Program campaign, and will be reflected in the 2014 economic impact report.

Sandians also logged more than 115,000 volunteer hours in 2012. They supported STEM (science, technology, engineering, and math) education through a variety of community programs, such as family science and math nights and engineering challenges, that reached thousands of students.

Mileposts

New Mexico *photos by Michelle Fleming*

Terry Stalker
40 5447

T.J. Garner
35 2551

Shirley Perea
35 3339

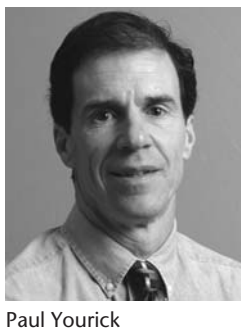
Recent Retirees

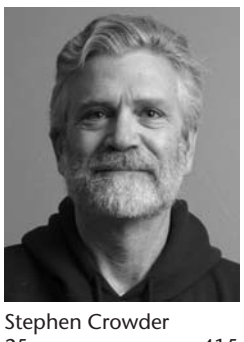
Gary Kellogg
37 1114

Jaime Gomez
30 5781

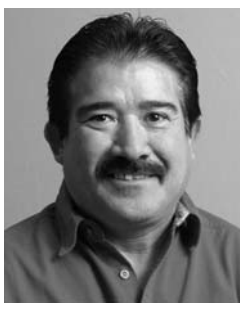
Guadalupe Massoth
30 9517

Danelle Tanner
30 2632


Paul Yourick
30 6010


Stephen Crowder
25 415

Charline (Char) Welles
25 3520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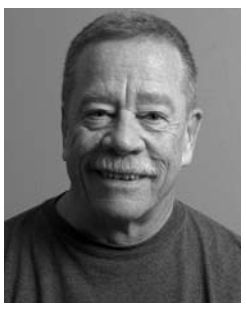
Michael Lanigan
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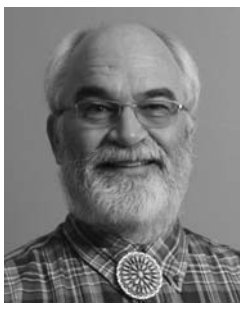
Steven Rezac
25 2242

James Wiseman
25 5946

Dennis Anderson
20 6114

Lothar Bieg
20 2632

Theresa Brown
20 6924


Mike Du Mond
20 4135

Robert Jarecki Jr.
20 1746

Robert Abbott
15 1463

Eugenia Bekaye
15 4000

Larry Bruskas
15 6831

John Casias Jr.
15 423

Michael Cassady
15 3520

Michael Kaneshige
15 2554

Curtis Keliiaa
15 9336

Julie Lujan
15 96

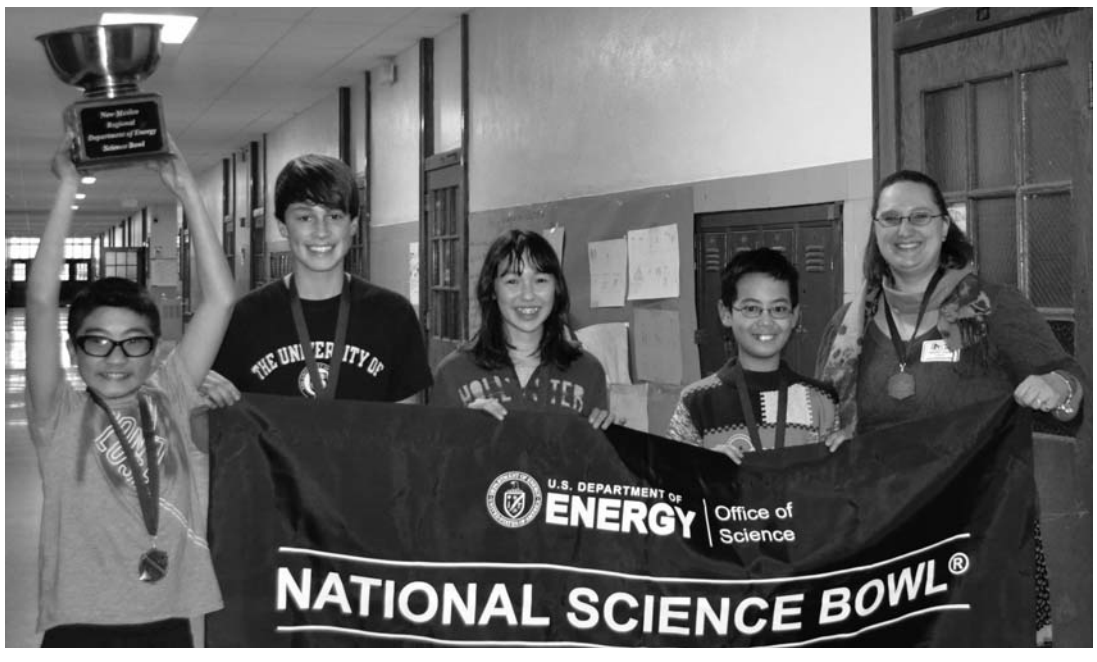
Ken Morris
15 2728

Gina Talandis
15 2998

Eric Varley
15 5943

Jane Zingelman
15 3654

Los Alamos Middle School wins regional DOE Science Bowl



Following close on the heels of their older colleagues, a team from Los Alamos Middle School won the DOE Regional Middle School Science Bowl on Feb. 8. The team will represent New Mexico in the DOE National Science Bowl in Washington April 24-28. The Los Alamos High School team won the regional high school competition on Jan. 25. Both teams will receive all-expense paid trips to the competition.

Sandia's Community Involvement Dept. 3652 coordinates this annual event for DOE. This year, more than 130 students from 12 New Mexico middle schools participated, supported by a dedicated team of volunteers from Sandia and the community.

The National Science Bowl for middle school students was started in 2002 and includes two types of competitions — academic (math and science) and a model car race. The car race provides the students with a hands-on science and engineering experience where the teams design, build, and race model cars.

The National Science Bowl is held at the National 4-H Center. In 2014, more than 110 teams will compete for the national title. In addition to the academic competition, students are given the opportunity to attend presentations by well-known scientists on current topics in math and the sciences.

Marlene Brown is a 2014 Woman of Influence

Marlene Brown (2958), who started at Sandia as an intern in 1995 and became a member of the technical staff in 1999 working in photovoltaics, has been selected as one of *Albuquerque Business First's* 2014 Women of Influence.

Marlene is a recognized leader in the solar power community in New Mexico and around the country. She was named a "Solar Hero" in *Solar Today* magazine in 2009, was the recipient of the Women in Solar Energy Award from the American Solar Energy Association in 2009, and was listed as one of the top 10 women in renewable energy in *Petroleum World* magazine in 2010. She is a sought-after speaker on photovoltaic applications for organizations in New Mexico and around the country.

MARLENE BROWN

In a career marked by notable professional success and proactive involvement in the community as mentor, teacher, and volunteer, Marlene cites her work empowering women — for example, through her women-only classes in photovoltaic systems installation — to be her proudest accomplishment. Her Facebook username — "mbwildwoman" — says it all: She is fiercely determined to help women succeed. In her Women of Influence nomination package, Marlene responded to the question "What needs to happen in order for more American women to reach the top levels of leadership in business?" this way: "Women need to believe in themselves and not give in to their own fears. Our fears stop us from doing so many things. We are raised differently and still have to get past what stops us. We need to start mentoring women when they are young and encourage them to pursue their dreams." Marlene has organized her life to live by those words.

Marlene is one of 30 women recognized by *Albuquerque Business First*, formerly called the *New Mexico Business Weekly*, a newspaper and companion digital edition that focus on business and economic issues. According to the publication's website, the 30 honorees were selected by a panel of judges from among more than 400 nominees. The award recognizes New Mexico's most dynamic women of diverse professional backgrounds who stand out as role models for their peers and are leaving a lasting and positive mark on the state.

In her 15-plus years at Sandia, Marlene has worked in the Labs' satellite programs and nuclear weapons programs as well as in photovoltaics.

Currently a component evaluation surveillance engineer in Integrated Stockpile Evaluation Group 2950, she has also worked as a quality engineer for subsystems and components in the W76 and B61 programs, project lead for workforce development for DOE, and Tiger Team lead for the Solar America Cities Project.

She provided on-orbit analysis for NNSA Nuclear Detonation System satellite payloads and has served as a subject matter expert for renewable energy for Sandia's Facilities organization.

Marlene holds a BA in environmental and natural sciences from The Evergreen State College, Olympia, Wash., and master's degrees in electrical engineering and systems engineering. She holds professional certificates in a diverse range of disciplines, from electrical trades and energy-efficient building technology, to systems engineering and architecting.

When she's not on the job, Marlene's work doesn't stop. She volunteers her time as a consultant for the Boko Bed Net Project. The project seeks to reduce malaria in Ghana through use of simple technologies. By building a bed net with a light and a fan powered by PV panels, people are encouraged to use bed nets, which lead to a reduction in malaria.

Marlene learned to build the PV panels and is helping teach local people to build them themselves. She also found an Albuquerque company to provide LEDs to the project.

The do-it-yourself panels Marlene introduced to the project are increasing efficiency, reducing the cost, and creating local jobs.

In a testimonial written in support of her Women of Influence nomination, a longtime colleague from the private sector said, "Marlene is an incredible leader, and has helped bring a lot of women into the renewable energy field. I have known Marlene for almost 20 years, and taught numerous solar classes with her, and she not only really knows the technology, but can convey it in a way to make it understandable and exciting to people at all levels.

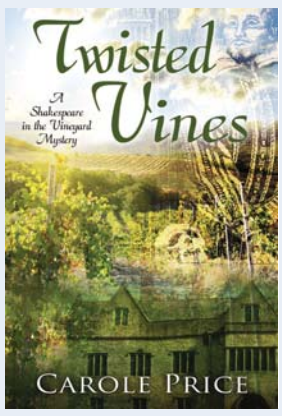
"Working with Marlene has been a pleasure, because she always gets things done and forges ahead even when things get difficult and others might give up. I know that a lot of women in the solar field really look up to Marlene as a mentor and role model."

My life as a mystery writer and police volunteer

By Carole Price

When I retired from Sandia in 1998, murder had never entered my mind except for in the mysteries I loved to read. Two years later, I started a new adventure after talking with author Penny Warner at a book signing. She invited me to join her critique group, and my mind started thinking of new ways to kill people off in prose.

Since that day, much has happened. I wrote my first mystery novel, set in Martha's Vineyard. After receiving my share of rejection letters, I retired that book to the far reaches of a file drawer.



CAROLE PRICE'S first published novel, *Twisted Vines.*

I then stumbled upon the inspiration for my next book. My daughter had moved to Ashland, Ore., home of the famous Oregon Shakespeare Festival, and my husband and I attended several plays while visiting her. Simply put, I fell in love with the Bard and the theater, signing on for a behind-the-scenes tour and later interviewing someone from the festival. I was completely hooked and started to write a Shakespearean mystery set in Livermore's wine country. This novel would become *Twisted Vines*, my first published book.

If I was going to write mysteries, I realized that I needed to understand police procedures. So in 2003, I graduated from Livermore's Citizens Police Academy and became a volunteer with the Livermore Police Department.

LADYKILLER — Carole Price may seem the unlikeliest person in the world to be plotting murder from her home office, but since her retirement from Sandia, that's exactly what she's been doing. And getting paid to do it, all in fiction, of course.

I now help the traffic department by tagging abandoned vehicles (those that have not been driven for 72-plus hours). Every Monday, dressed in my navy and khaki uniform, I pick up a radio, keys, and call-ins. I then hop into a volunteer police car and head out to work. I'm the eyes and ears of the police department while I cover my beats — the two city sectors that I monitor for abandoned vehicles. Fortunately, I've only had to radio dispatch a few times for officer assistance.

The Livermore Police Department has been very supportive of my writing and generous in answering my many inquiries about police procedures. My research is fun. During roleplays with the special weapons and tactics (SWAT) unit, I've been shot at (with paint guns), handcuffed, and tossed to the ground.

Meet crime analyst Caitlyn Tilson Pepper

In 2011, Five Star Publishing offered me a contract for *Twisted Vines*, the first in my Shakespeare in the Vineyard mystery series. Published in August 2012, *Twisted Vines* takes place in Livermore with a few scenes (just talk, no murders) in an interview room inside the Livermore police station. My publisher has specific rules for using the name of a real town or city; permission is required for every "real" name/place that appears in a scene with action. To meet this requirement, I consulted with the Livermore police chief. He then asked the city attorney to grant me written permission to use one of the police department's rooms in my book as long as my text didn't portray the police department or Livermore in a negative light.

Twisted Vines tells the story of crime analyst Caitlyn Tilson Pepper, who inherits a vineyard and two Shakespearean theaters in Livermore from an unknown aunt and becomes a target for murder. Cait's investigation into the life and death of her aunt, a famous Shakespearean actress, forces her down an ever-darkening road paved with familial lies, devastating secrets, and multiple murders.

Since the consolidation of publishers and the disappearance of independent bookstores, authors are required to actively promote their own books. When *Twisted Vines* came out in the fall of 2012, I joined three other authors for a book tour of San Francisco Bay Area bookstores and libraries to promote our books. I also accepted an opportunity to be part of a panel at a mystery writers' conference in my home state of Ohio.

In March, I'll be in Monterey, Calif., attending the Left Coast Crime Conference for another opportunity to promote my Shakespeare in the Vineyard mystery series. The second book in the series, *Sour Grapes*, comes out this fall.

I'm currently working on the third book in the series, *Prey in the Vineyard*, rewriting a stand-alone mystery set on Martha's Vineyard, and writing some short stories.

* * *

Carole Price worked as an administrative assistant from 1981 until she retired in 1998. Following retirement, she contracted for DOE and returned to Sandia as a contractor for a 10-month stint. Her first published mystery, *Twisted Vines*, is available at Amazon, Barnes and Noble, Bay Area bookstores, and libraries across the United States and internationally. You can learn more about Carole's mysteries at her website: http://carolepricemysteries.com. She is also a monthly blogger at http://theladykillers.typepad.com.