New standard for supercomputing proposed

System developed by Sandia-led group rates real-world problem-solving capabilities of supercomputers

By Neal Singer

A new supercomputer rating system will be released by an international team led by Sandia on Nov. 17 at the upcoming Supercomputing Conference 2010 in New Orleans.

> *"We're all engineers and we don't want to over-hype or over-promise, but there's real excitement about these kinds of big data problems right now."*
>
> **— Researcher Richard Murphy**

The rating system, Graph500, tests supercomputers for their skill in analyzing large, graph-based structures that link the huge numbers of data points present in biological, social, and security problems, among other areas.

"By creating this test, we hope to influence computer makers to build computers with the architecture to deal with these increasingly complex problems," says Richard Murphy (1422).

"The very careful and thoughtful definition of this new competitive standard is both quite subtle and tremendously important, as it may heavily influence computer architecture for decades to come," says Rob Leland, director of Computations, Computers, and Math Center 1400.

The group isn't trying to compete with Linpack, the current standard test of supercomputer speed, says Richard. "There have been lots of attempts to supplant it, and our philosophy is simply that it doesn't measure performance for the applications we need, so we need another, hopefully complementary, test."

(Many scientists view Linpack as a 'plain vanilla' test mechanism that tells how fast a computer can perform basic calculations, but has little relationship to the actual problems the machines must solve.)

The impetus to achieve a supplemental test code came about at "an exciting dinner conversation at Supercomputing 2009 [conference]," Richard says. "A core group of us recruited other professional colleagues, and the effort grew into an international steering committee of over 30 people." See www.graph500.org.

Many large computer makers have indicated interest, says Richard, who says there's been buy-in from Intel Corp., IBM, AMD Inc., NVIDIA Corp., and Oracle Corp. "Whether or not they submit test results remain to be seen, but their representatives are on our steering committee."

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Sandia LabNews

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Sandia National Laboratories

Veteran-owned businesses and Sandia

VETERAN AND SMALL BUSINESS owner Tracy Solomon, right, of TEVET LLC, and Kent Childs (1748) look over some equipment that Solomon's company supplied to Sandia. (Photo by Randy Montoya)

By Heather Clark

Tracy Solomon's business cards depict three photographs of uniformed veterans — himself, his father, and his grandfather — but this service-disabled Navy veteran doesn't dwell on the injuries he sustained during the first Gulf War. He'd rather talk about how his small business can help Sandia researchers get the test and measurement equipment they need and how his company's services add value to their purchases.

Solomon's company, TEVET LLC — short for Test Equipment Veterans — is a service-disabled veteran-owned small business (SDVOSB) that provides equipment from manufacturers such as Agilent Technologies.

TEVET is one of 120 veteran-owned companies doing business at the Labs whose owners have started companies after serving in the military or being

(Continued on page 5)

Grants advance Sandia/UNM Cancer Center partnerships

National Cancer Institute awards total nearly $4 million

By Stephanie Hobby

The National Cancer Institute recently announced two five-year awards totaling nearly

SANDIA FELLOW and UNM professor Jeff Brinker is working with the UNM Cancer Center to research nano-bio materials and nanomedicine. (Photo by Randy Montoya)

$4 million for a partnership between the University of New Mexico Cancer Center and Sandia. One $1.95 million grant will fund the creation of a joint Cancer Nanotechnology Platform Partnership, and another $1.8 million grant will pay for a new Cancer Nanotechnology Training Center to train a new generation of multidisciplinary scientists. In addition, the State of New Mexico is providing another $2 million to build a lab supporting Sandia Fellow

(Continued on page 9)

Inside . . .

That's that

Got a note the other day from Dominique Foley Wilson (1912), calling my attention to a headline in a recent edition of *Sandia Daily News*. Where else but Sandia, she wanted to know, could you get away with a headline like this: **"Seminar on BAR protocols for MAD services."** To which I responded that if anyone from outside Sandia showed up for this seminar, they'd end up sorely disappointed. Disappointed enough, in fact, to go away mad, looking for a bar.

And by the way, the BAR seminar isn't a mixology course teaching bartenders how to deal with angry patrons; it's an exploration of something called Byzantine Altruistic Rational (BAR) protocols for Multiple Administrative Domains (MAD). The *SDN* item explains that, "to meet the needs of MAD environments, BAR protocols draw from distributed systems and game theory to tolerate both 'byzantine' behaviors when broken, misconfigured, or malicious nodes arbitrarily deviate from their specification, and 'rational' behaviors when selfish nodes deviate from the specified protocol to increase their own utility." All kidding aside, folks, this ain't easy stuff; it's probably about as complicated as anything the human mind has ever tried to grapple with. That there are people who are conversant with this language and the issues it addresses often amazes me.

* * *

Speaking of language, we English major types — I have a degree in journalism, but I think you know what I mean: bookish, tweedy, self-important (just kidding) — consider ourselves to be "words" people and consider scientists, engineers, and mathematicians to be "numbers" people. Until I came to work at Sandia, I was pretty comfortable with those characterizations; they seem self-evident, don't they?

Over time, though, I've come to realize just how much writing my technical colleagues are required to do in the course of their work: lab notebooks, papers, articles, proposals, posters, publications. (What am I forgetting here?) Sure, we employ a lot of excellent tech writers who support the line, but still, I deeply suspect that there are plenty of people with an MTS or TNG after their names who write a lot more than I do . . . and then pull down big hours in a lab solving the thorniest technical challenges of our times.

My point is that practically all of us — regardless of which side of the house we live in — write every day in the course of our work. As a generalization, I think it's fair to say that the better we are at the craft of writing, the better we do in our careers.

To that end, let me commend to you the new blog launched by my colleague, Julie Hall (800), "The Write Stuff." On the blog's homepage, Julie writes, "This blog explores issues concerning grammar, style, writing, and effective written communication. I am especially interested in the unique requirements and challenges of webpages, presentations, and social media." In her very first post, back in late August, "Stamping out typos and bad writing," Julie asked, "Does it bother you when you see grammatical errors or typos in the newspaper or on a website? Do you get frustrated when you don't understand a colleague's email? Have you ever taken a red pen to a restaurant menu that was riddled with misspellings? (OK, so maybe the latter is a bit extreme but, I swear, it was only a paper menu.)"

Let me tell you something about Julie. I've been in this writing game for . . . well, let's just say a long time. And I can tell you that I've never worked with anyone who cares more about, and brings more passion to, the subject of good, strong, clear, concise writing than Julie. Trust me on this: She knows whereof she writes. The blog is well-written (no surprise there) and fun; Julie takes a light hand to what could be a heavy topic. Check it out via the internal *Lab News Interactive* website at https://info.sandia.gov/newscenter/interactive/. The Write Stuff blog is listed along the right column along with several other interesting and often provocative *Lab News Interactive* blogs. I encourage you to check 'em all out.

* * *

Sticking with language stuff, the recent flurry of Halloween-related advertising flyers and brochures sparks this thought: Are there any two words in the English language that have been more abused by second-rate copywriters than "spectacular" and "fantastic?" The latest abuses (seen in Sunday inserts in the *Albuquerque Journal*): "spook-tacular!" and "fang-tastic!" (The fang-tastic! sale, by the way, promised "un-boo-lievable!" savings.) This stuff is scarier than anything I saw on Halloween night.

See you next time.

— Bill Murphy, (505-845-0845, MS0165, wtmurph@sandia.gov)

Jackie Kerby Moore honored by research park group

Jackie Kerby Moore has received a Career Achievement Award for her work as executive director of the Sandia Science & Technology Park from the Association of University Research Parks (AURP) at a recent international meeting in Minneapolis.

JACKIE KERBY MOORE (1933) receives a Career Achievement Award from Greg Hyer, associate director of the University of Wisconsin-Madison University Research Park, at a recent meeting of the Association of University Research Parks in Minneapolis.

Jackie, manager of Technology & Economic Development Dept. 1933, also has served as the executive director of the Sandia Science & Technology Park (SS&TP) since its inception in 1998.

Jackie was one of several honorees at the 15th annual AURP Awards of Excellence, which encourage the development of best practices among research parks. The AURP is a professional association of university-related research and science parks.

"AURP recognizes exceptional leadership in innovation by honoring university research parks, individuals, and companies who are driving innovation in their communities," AURP President Harold Strong said.

Jackie, a past president of the AURP, has overseen the management, marketing, recruitment of tenant companies, and stakeholder relations at the park.

The 250-acre master-planned research park located just outside the Eubank Gate at Sandia/New Mexico has 31 businesses that employ more than 2,000 people. Total investment in the park exceeds $334 million, according to data Sandia maintains on the park.

In 2008, the AURP named the SS&TP the Outstanding Research Park of the Year. — *Heather Clark*

Sandia suppliers win Small Business Heavyweight Awards

By Adriana Gronager

Four small businesses that are Sandia suppliers have won the Small Business Heavyweight Awards from *New Mexico Business Weekly*.

The businesses were nominated by Don Devoti, manager of Small Business Utilization Dept. 10222.

The winning businesses were Backerworks Manufacturing LLC, Enregs Inc., Machining Solutions LLC, and Voss Scientific.

Don says he nominated these companies to show Sandia's support for local small businesses and their importance to the Labs.

"These are great small businesses that are key to Sandia's mission success, and I am proud to recognize them," says Devoti.

The awards were distributed at a ceremony in August.

- **Backerworks Manufacturing** is a small, woman-owned business that provides precision machining, custom fabrication, and certified welding capabilities for Sandia.
- **Enregs**, a small disadvantaged, 8(a) and woman-owned small business, has been working with Sandia since 2003. Enregs writes and reviews reports that look at potential safety hazards at Sandia and works with the Labs to help ensure that proper safety precautions and action plans are in place.
- **Machining Solutions LLC**, also an 8(a) small business, does high-precision machining work for Sandia and works with high-rigor groups such as the satellite group.
- **Voss Scientific**, a small business, works with Sandia in areas that include: creation of million-degree plasmas, pulse power energy flow optimization, X-ray radiography, laser propagation and phenomena, and high-power microwave systems.

Sandia LabNews

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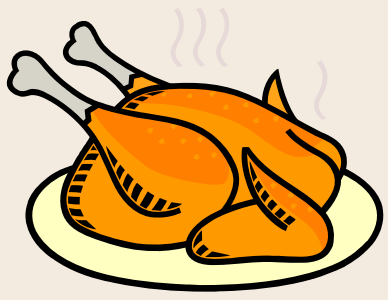

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- IPOC (front entrance)
- In front of Bldg. 800
- Bldg. 825 (Steve Schiff Aud. parking lot
- Bldg. 887 (NE parking area just inside Eubank Gate)

Questions to Patty Zamora
844-2416

DOE gets serious about reducing greenhouse gas emissions

By Patti Koning

Last fall, President Barack Obama called on federal agencies to "lead by example when it comes to creating innovative ways to reduce greenhouse gas emissions, increase energy efficiency, conserve water, reduce waste, and use environmentally responsible products and technologies."

Executive Order (EO) 13514, which he signed in October 2009, sets ambitious goals for the reduction of greenhouse gas emissions, energy and water use, and waste.

Those federal agencies, DOE included, are now developing strategies to meet these targets. In September, DOE issued the *Strategic Sustainability Performance Plan: Discovering Sustainable Solutions to Power and Secure America's Future*.

The plan lays out guidelines for meeting the 28 percent reduction, specified in EO 13514, in greenhouse gas emissions from electricity, fossil fuel, fugitive gas, and transportation to be achieved by fiscal year 2020, using FY2008 as a baseline. Achieving this, says Gary Shamber (8516), manager of Environmental Management for the California site, will require some innovative solutions as well as a radical change in behavior.

"Twenty-eight percent in 12 years is a lot," he says, "and as is the case at Sandia/New Mexico, electrical energy use is the predominant source of emissions. We've tried to effect a reduction in the past five years without much success. Even though much of our energy use is somewhat fixed, changing our behavior will certainly help, turning off lights and equipment for example, but this alone is not going to get us to 28 percent. We will need substantial infrastructure improvements, too, and possibly new alternative sources."

Buildings consume a tremendous amount of energy, so as new, more energy-efficient buildings replace older, less efficient buildings, they contribute to meeting that reduction. Of course, the energy usage associated with construction is factored into the big picture.

The 28 percent reduction in greenhouse gas emissions also targets direct emissions from fleet vehicles, stationary combustion, such as from boilers, and fugitive emissions such as off-gassing from the Labs' chemical inventory. Replacing asphalt with landscaping and planting trees can be used to offset emission totals.

"We've even talked about having groups adopt a tree and commit to its care," Gary says. "A tree can do a tremendous amount of work."

EO 13514 also calls for a 13 percent reduction by FY2020 in indirect emissions — employee commuting, business travel, waste, and the production and transportation of purchased material. This is where individual actions can make a big difference, Gary says.

PATRICK SCHINDLER (8226) points out the battery management system he designed for his electric Volkswagen Beetle. The battery management system keeps the car's battery — 20 cell banks of lithium ion batteries in series — at a consistent voltage, regulates the car's draw on the battery, and transmits the cell voltages to a user interface that gives the driver information about the remaining charge and health of the battery. This battery provides about 10 kwh of energy for a range of approximately 30 miles. (Photo by Dino Vournas)

To achieve these goals, he thinks that members of the workforce (MOWs) need to regard their individual environmental stewardship in the same way they regard safety. "We're working hard to integrate a safety mindset into the way we naturally do work, so it's not just a box you check off but something you think about every step of the way," he explains. "We need to get to the same place with environmental stewardship. We must constantly be thinking about how to conserve energy and water, reduce consumption, and recycle."

MOWs can maximize use of the chemical exchange program and seek out ways to divert waste from the landfill. (Those disposable plastic spoons can really add up.) Further investments in improving videoconferencing technology could reduce air travel. MOWs can also reduce the number of miles driven to work by using public transportation, biking, or carpooling. Gary says he hopes that Sandia will eventually adopt a program similar to the one at Lawrence Livermore National Laboratory that allows employees to pay for public transportation expenses from a pretax flexible spending account.

Sandia won't get to 28 percent in one giant leap — it will be many incremental steps, some minor and some huge. One of the most important steps, says Gary, is for everyone to take ownership of the problem and make environmental stewardship second nature. You can read the Strategic Sustainability Performance Plan at www.energy.gov/media/DOE_Sustainability_Plan_2010.PDF

(Continued on next page)

Sandia CaliforniaNews

HITEC workshop explores intersections between biofuels and electric vehicles

By Mike Janes

In the second in a series of workshops coordinated by Sandia's Hub for Innovation in the Transportation Energy Community (HITEC), participants from the automobile industry, biofuels and energy sectors, academia, government, and other organizations gathered near Washington, D.C., last month to engage in a discussion on biofuels and electric vehicles.

The workshop, *Transitioning the Transportation Sector: Exploring the Intersection of Biofuels and Electric Vehicles,* was designed to forge a dialogue that considers future technology pathways encompassing both electric vehicles and biofuels as alternative forms of transportation energy. Nearly 40 participants, including representatives from Chevron Corp., General Motors Co., Toyota Motor Corp., US Renewables, Resources for the Future, and the Electric Power Research Institute, took part.

"As we continue to consider what our future transportation pathways are going to look like, we need to take a broader systems perspective and examine the intersection of technologies," says Dawn Manley (8114), manager of the systems research and analysis group and lead workshop organizer. Ron Stoltz (8302), manager of Advanced Energy Initiatives, was co-organizer of the event.

Some technologies have natural synergies, Dawn says, such as biofuels and combustion engines, since

(Continued on next page)

DAVE McCURDY, former congressman from Oklahoma and current president of the Alliance of Automobile Manufacturers, was one of the guest speakers at the HITEC workshop.

Gas Emissions

(Continued from page 3)

At one time or another, most people at the California site have probably noticed an odd-looking bike parked in one of the racks. It's a regular bike, but it also has a motor — an electric bicycle, hand-built by Patrick Schindler (8226).

A self-described tinkerer, Patrick first learned about electric bicycles a few years ago and then, as he puts it, "I instantly became obsessed." Since then, he's built several different models of electric bikes including one for his wife, who works at Lawrence Livermore National Laboratory, and another for his office mate Dave Tobeck (8226).

He's convinced the US is on the cusp of an electric bike revolution, noting that they are ubiquitous in China. "An electric bike is really amazing. It's small and light enough to put on a car bike rack or take on BART, yet it can go up to 40 miles per hour with a 50-mile range," Patrick says. "It's dead silent and doesn't make anyone angry. And you always have the option of pedaling. It's the ultimate hybrid."

In the summer and when the weather is nice, Patrick rides his electric bike to work (his commute is approximately a mile each way). When he needs a car, he drives one of two electric Volkswagen Beetles that, naturally, he converted himself.

He's hoping that the site can put in place a policy to allow a charging station in the parking lot. "It doesn't have to be fancy," Patrick says. "All we need is a 110-volt outlet — almost any car out there has the ability to charge on a 110-volt outlet. I know there are more people on site who'd use an electric car if they could charge it at work."

Patrick travels two miles a day, maybe four if he goes home for lunch. On the opposite end of the spectrum is Curtis Specht (8231). Over the past 42 years, he estimates he's traveled more than 700,000 miles between Sandia and his home in Stockton. Only about a quarter of those miles were in his own vehicle, thanks to a carpool that has spanned Curt's career at Sandia.

He and a friend from college, now retired from Sandia, planned to drive together and quickly found two other Sandians living in Stockton. About 10 different people have participated in the carpool over the last four decades. Today John Smith (8123), Ken Lee (8222), and Mike Gutzler (8353) share the ride with Curt.

The carpool has worked because they've kept it simple — everyone is on the same 9/80 schedule and they work the same hours. "We meet at the same Home Depot parking lot every morning," says Curt. "If you know you have to work late or have an appointment, you drive yourself."

Besides the cost savings from using less gas and reducing vehicle wear and tear — Stockton is 90 miles roundtrip from Sandia — the carpoolers also enjoy one another's company. "We shoot the breeze and have a good time," Curt says.

Commuting Alternatives

PATRICK SCHINDLER with one of his self-designed, home-built electric vehicles. (Photo by Dino Vournas)

Mike Tootle (8243-1) doesn't shoot the breeze with anyone in his daily commute, but he does enjoy the breeze while riding his bike. He's been riding his bike to work for the past 25 years. An avid cyclist in his free time, Mike says he has no desire to drive, although he occasionally walks to work for a change of pace. His roundtrip commute? Six miles.

"I'm from the East Coast, so I'm used to biking in the rain," he says. "If it rains, I wear my rain suit. Otherwise nothing changes."

When Mike first came to Sandia he lived in Tracy, about 20 miles each way, but he still found a way to bike home. During the summer when the days are long, he'd get a ride to work and bike home, taking back roads.

About a year ago, John Andersen (8238) began running to work. On Monday, he drives or bikes the two miles from his home to Sandia, bringing with him a change of work clothes and running gear. He runs home that evening and back again on Tuesday morning, taking a shower in the locker room in Bldg. 910 and changing into the work clothes he left the day before. He drives or bikes home that evening, and repeats the pattern on Wednesday and Thursday.

"For me, it's a way to kill two birds with one stone while feeling a little better about not contributing more smog to the environment," he says. "Plus it's cheaper — the drive, while it's short, puts wear and tear on my car and there is also gas."

Levi Lloyd (8966) is another hybrid commuter — he rides his bike to the Altamont Commuter Express (ACE) train in Tracy, then rides the train to Livermore, and bikes to Sandia from the Vasco Road ACE station. "When I moved to Tracy about a year and a half ago, I was concerned with the environmental footprint of commuting," explains Levi. "So I picked a home close to the ACE train in Tracy so commuting by bike and train would be an option."

He enjoys being able to nap and read on the train. He does drive to work sometimes, usually because of weather or because of schedule. "Driving takes about 35 minutes and biking to and from the train station takes about 50 minutes," he says. "I'm happy to give up those 15 minutes for a more relaxed commute."

Workshop

(Continued from page 3)

biofuels will ultimately have to burn in some sort of engine. Others, however, don't have such apparent links, making it all the more important to explicitly consider how the technologies may evolve together.

Typically, Dawn says, those in the transportation energy community have tended to tackle issues directly related to one technology at a time. Biofuels and electric vehicles, for instance, are for the most part being developed separately since each has its own challenges: the biofuels industry grapples with scale, food, and water issues (as well as production and distribution infrastructure development), while the electric vehicles industry must address battery development, strategic materials, range issues, and other questions. "But for the most part, few people are talking about both technologies together and how they interact with one another," Dawn points out.

The workshop explored three key issues:

• the potential carbon savings derived from biofuels and electric vehicles (and the expectations for the short- and long-term)

• the best use of biomass for energy (e.g., when do liquid fuels make sense and when does electricity)

• regional uses and local consumer preferences and how they both influence the evolution of biofuels and electric vehicles

Though a post-workshop report is still in development, Dawn says a clear theme is emerging: the difficulty in getting the biofuels and electric vehicles communities together with a common language and common discussion points.

JOE WHITE, a senior editor in *The Wall Street Journal's* Washington, D.C., bureau and "Eyes on the Road" columnist, delivers closing remarks at the HITEC workshop.

"It was really hard to have the conversation," she says, because the two communities were simply not used to talking about their individual technology with the added context of the other. While Dawn says she found it surprising that the two sides struggled so much in this regard, it was encouraging that the participants acknowledged the importance of having such discussions.

Pulitzer Prize-winning journalist Joe White, a senior editor in *The Wall Street Journal's* Washington, D.C., bureau and "Eyes on the Road" columnist, delivered closing remarks at the workshop. He cautioned that automakers tend to be risk averse and might be slower to adopt electric vehicles and biofuels than some might hope.

"If it means blowing a billion dollars, an automaker is going to be reluctant to experiment with an untested technology," White says. Consumers, he says, are still buying petroleum-based vehicles and even SUVs, and gasoline is still more abundant and cheaper than alternative fuels.

Still, White says, there are signs of hope.

"The auto industry is taking the challenge more seriously than ever before," he asserts. "They're pouring billions into new alternatives, and there's a card-deck of technologies they're exploring: biofuels, battery and electric, hydrogen, and hybrids of various kinds. There is all sorts of experimentation going on."

Dawn says a report on the *Transitioning the Transportation Sector: Exploring the Intersection of Biofuels and Electric Vehicles* should be completed and made available in the coming weeks.

Supercomputers

(Continued from page 1)

Each organization has donated time and expertise of committee members, he says.

While some computer makers and their architects may prefer to ignore a new test for fear their machine will not do well, the hope is that a large-scale demand for a more complex test will be a natural outgrowth of the greater complexity of problems.

How does it work?

Large data problems are very different from ordinary physics problems.

Unlike a typical computation-oriented application, large data analysis problems often involve searching large, sparse data sets performing very simple computational operations.

To deal with this, the Graph500 benchmark creates two computational kernels: a large graph that inscribes and links huge numbers of participants and a parallel search of that graph.

"We want to look at the results of ensembles of simulations, or the outputs of big simulations in an automated fashion," says Richard. "The Graph500 is a methodology for doing just that. You can think of them being complementary in that way — graph problems can be used to figure out what simulation actually told us."

Performance for these applications is dominated by the ability of the machine to sustain a large number of small, nearly random remote data accesses across its memory system and interconnects, as well as the parallelism available in the machine.

Five problems for these computational kernels could be cybersecurity, medical informatics, data enrichment, social networks, and symbolic networks. "Many of us on the steering committee believe that these kinds of problems have the potential to eclipse traditional physics-based high-performance computing over the next decade," says Richard.

While general agreement exists that complex simulations work well for the physical sciences, where lab work and simulations play off each other, there is some doubt simulations can solve social problems that have essentially infinite numbers of components. These include terrorism, war, epidemics, and societal problems.

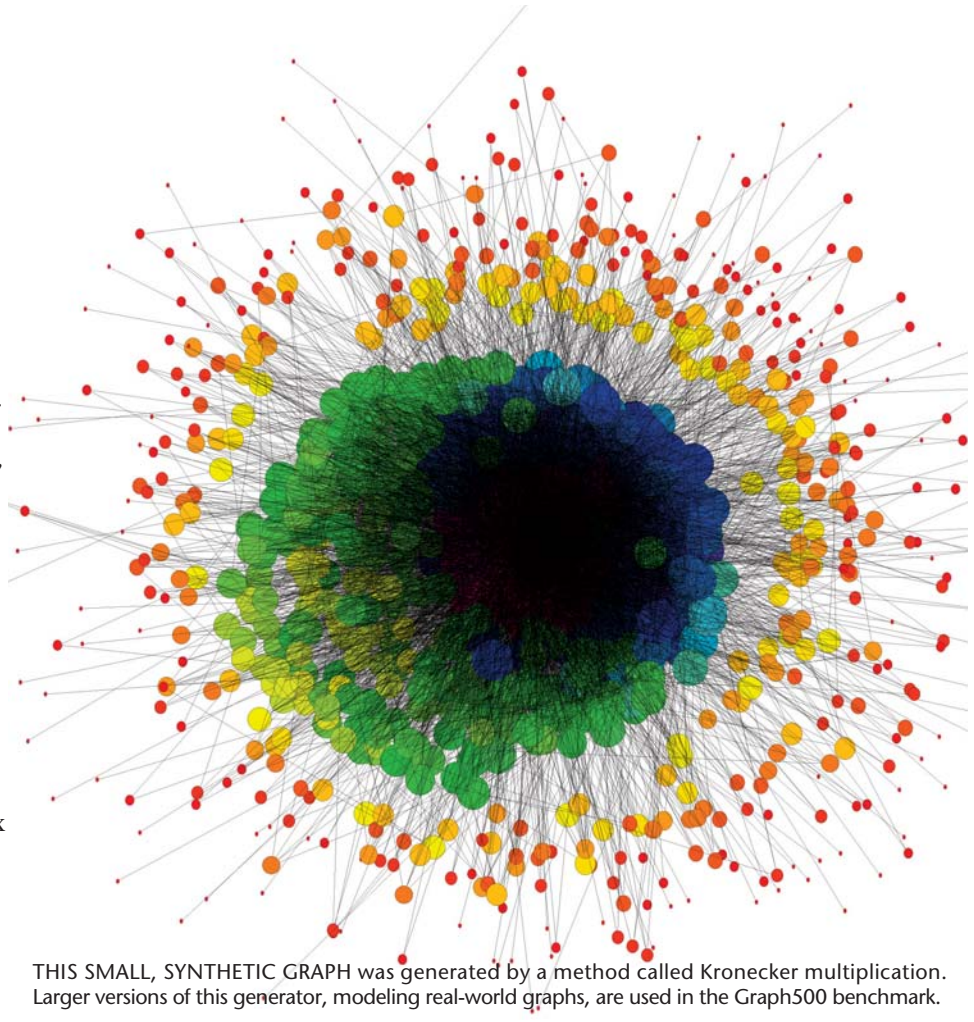
"These are exactly the areas that concern me," Richard says. "There's been good graph-based analysis of pandemic flu. Facebook shows tremendous social science implications. Economic modeling this way shows promise."

Studies show that moving data around (not simple computations) will be the dominant energy problem on exascale machines, the next frontier in supercomputing and the subject of a nascent DOE initiative to achieve this next level of operations within a decade. (Petascale and exascale represent 10 to the 15th and 18th powers, respectively, operations per second.)

Part of the goal of the Graph500 list is to point out that in addition to more expense in data movement, any shift in application base from physics to large-scale data problems is likely to further increase the application requirements for data movement, because memory and computational capability increase proportionally. That is, an exascale computer requires an exascale memory.

"In short, we're going to have to rethink how we build computers to solve these problems, and the Graph500 is meant as an early stake in the ground for these application requirements," Richard says.

"We're all engineers and we don't want to over-hype or over-promise, but there's real excitement about these kinds of big data problems right now," he says. "We see them as an integral part of science, and the community as a whole is slowly embracing that concept. However, it's so new we don't want to sound as if we're hyping the cure to all scientific ills. We're asking, 'What could a computer provide us?' but ignoring the human factors in problems that may stump the fastest computer. That'll have to be worked out."



THIS SMALL, SYNTHETIC GRAPH was generated by a method called Kronecker multiplication. Larger versions of this generator, modeling real-world graphs, are used in the Graph500 benchmark.

Some large data problem statistics

- **Cyber security:** Large enterprises may create 15 billion log entries per day and require a full scan.
- **Medical informatics:** There are an estimated 50 million patient records in the US, with 20 to 200 records per patient, resulting in billions of individual pieces of information all of which need entity resolution: that is, which records belong to him, her, or somebody else.
- **Data enrichment:** Petascale data sets include maritime domain awareness with hundreds of millions of individual transponders, tens of thousands of ships, and tens of millions of pieces of individual bulk cargo. These problems also have different types of input data.
- **Social networks:** Almost unbounded, like Facebook.
- **Symbolic networks:** Often petabytes in size. One example is the human cortex with 25 billion neurons and approximately 7,000 connections each.

Veteran businesses

(Continued from page 1)

wounded while serving.

The owners are known as "vetrepreneurs," and under federal law, Sandia can set aside procurement contracts for veteran-owned companies and SDVOSBs, recruit them, and advocate for them.

Toni Leon Kovarik, an advocate in Small Business Utilization Dept. 10222 for veteran-owned businesses, says contract-related payments to veteran-owned small businesses were more than $20 million in fiscal year 2009, including about $3.1 million to SDVOSBs.

Toni recruits veteran-owned firms to bid on contracts at Sandia, attending events and holding office hours at the Veterans Procurement Assistance Center in Albuquerque.

John Smatana, vice president of sales for Factory Express, a certified SDVOSB, was introduced to Toni through the center. That initial contact eventually resulted in a contract for the Albuquerque office supply firm to supply and service high-security paper shredders, as well as other supplies and equipment repair, at Sandia.

Consistency of work makes a difference

Smatana and CEO David Zimpelman, who was diagnosed with a serious medical condition while serving at Kirtland Air Force Base in the 1980s, say the consistency of the work with Sandia has helped the company weather the recent economic downturn and helped it keep a full-time service technician on board, which helps all its New Mexico customers.

Smatana says the company carries the red, white, and blue SDVOSB logo on its website and letterhead.

Being registered as an SDVOSB "adds legitimacy to the company for the government purchasers. I think the next step is making sure that they have the opportunities for the service-disabled veteran-owned companies. I think they're out there, but I think there's a lot more that could be set aside," he says.

Toni also works with small businesses to prepare them to bid on projects at the Labs and to work with Sandia, which typically has more business requirements than the private sector, and sometimes encourages companies to partner to provide goods and services to the Labs.

"Working with veterans is an honor," Toni says. "We have some people who have just returned from service. To be able to help point them in the right direction, toward services that will help them grow their companies, means a lot."

Set-asides are competitive in marketplace

Toni also helps veteran-owned companies and SDVOSBs through her work inside the Labs by learning about pending contracts that such firms could bid on and by working with Sandia's contracting representatives to encourage them to set aside contracts for such companies.

Jeff Miller (10248), a contracting representative, recently set aside a Just In Time (JIT) agreement for SDVOSBs to provide Cisco networking hardware to the Labs. A decision on the agreement, estimated to be worth about $3.5 million for up to seven years, is expected to be made later this month.

Because he's spending taxpayer money, Jeff says he needs to make sure set-asides are still competitive by ensuring that the Labs can select from a pool of highly qualified companies.

"We don't think there will be any detriment to Sandia because there are enough qualified companies out there that can offer the service we need, as well as good competitive pricing," he says.

Zimpelman agrees that set-aside contracts cannot be handouts. Veteran-owned businesses need to earn their business and offer competitive prices and quality, but he thinks programs to help such companies are good public policy.

"The reason to support that is that we need to have some patriotism. Let's take care of those who took care of our country," he said. "I think it's good that this society as a whole supports those who are making a sacrifice."

Solomon agrees: "A young man or woman who enters military service is making a conscious decision to step forward and sign themselves over as property to their government to do with them what they will and to be placed in harm's way, if necessary, in order to protect and preserve this great nation. So I think it's important, especially in the veteran community, that the government does something for those who were willing to sacrifice."

Son and grandson of veterans

Solomon, the son of a Vietnam veteran wounded in the Tet Offensive and the grandson of a World War II veteran who was wounded after escaping from capture during the Bataan Death March, continues to suffer from pain due to his own injuries incurred during the first Gulf War, but overcame those obstacles and led a successful corporate career before starting TEVET. Both his father and grandfather received Purple Hearts.

He could have located the new company anywhere, but he chose to start his business to help those in his rural Appalachian hometown of Greeneville, Tenn., a Historically Underutilized Business Zone (HUBZone), in 2003.

For companies like TEVET — which obtained the first SDVOSB and HUBZone competitive set-aside procurement at Sandia — these set-asides have meant economic development and job creation.

Sixty percent of TEVET's workforce is veterans and the company just secured a 7,500-square-foot facility in Tennessee, Solomon says. The company also has seen its revenue grow each year, nearly doubling in 2010.

When TEVET began working with Sandia in 2009, the company opened an office in Albuquerque, and Solomon expects to expand further in 2011.

"Our goal is to grow our footprint in New Mexico, hiring people here locally," Solomon says.

New library offers a world of choices

Robust online presence allows patrons to participate in the library's decisions . . . and tap wealth of resources

By Neal Singer

DANIELLE POLLOCK (above) developed the new Tech Library homepage with Carol Ou, Laura Calderone, Amy Rein, and Julie Hillskemper. The new website permits comments and enables RSS feeds that will send Sandians alerts from journals, so that the researcher can see in advance what a new issue will contain. (Photo by Randy Montoya)

Anyone wondering where the online Sandia Technical Library has gone need only travel to the Sandia Techweb internal homepage and have sharp eyes.

There, among the nine categories, in the midst of approximately 60 visible entries, the single word "Library" sits modestly under the next-to-last category, "Info Sharing and Publishing." But it links to an amazing electronic world of information and knowledge.

When more people click the link, says Alan Burns, de facto chair of Sandia's Library Advisory Board, the keyword hopefully will be placed more prominently on the more sparsely populated, far-left list, a real-world correlation to Peter Pan's Tinker Bell glowing brighter when more people believe in her.

(The Library Advisory Board advocates for all the Labs' staff and for the library itself in Sandia's decision-making process, Alan says. He says that while he chairs meetings, Physical, Chemical, and Nano Sciences Center 1100 director Charles Barbour is the formal library board chair doing higher-level administration negotiations to acquire books, journals, and other matters involving finance.)

Those entering through the current link and then clicking "Technical Library Homepage" find themselves in an amazingly clear world of many choices. Once understood, these bring a strangely pleasing, small-town quality to unexpectedly efficient interactions.

To a much greater degree than ever before, a patron can participate in the library's decisions rather than only use its resources.

Two physical branch locations

You learn immediately that not only does the library have two physical branch locations — at CINT, off-base on Eubank Boulevard, and in the Bldg. 858 South mezzanine, as well as several specialized satellite collections — in addition to its truncated presence in Bldg. 804, but also that library managers are looking to "expand our branch library services" and "identify potential new locations," according to the homepage. A contact person, in addition to a poll and feedback column, are available to make your wishes known.

"New Books," print and electronic, are listed prominently. The print volume, *Bursts: the hidden pattern behind everything we do*, had three requests ahead of me. As I would at any other library, I'm waiting for it.

I ordered two older print books: Stephen Hawkings and Roger Penrose's *The Nature of Space and Time*, and Julian Schwinger's *Einstein's Legacy*. Both arrived at my desk through Sandia mail in only a few days.

E-books arrive immediately. I clicked on *Computational Intelligence in Engineering* (Rudas, Fodor, and Kacprzyk) and got not only a clear page-turning volume, but also a convenient side table of contents that allowed chapter-flipping with a single click. PDFs can be downloaded.

Most popular databases

The homepage also lists "Our Five Most Popular Databases" — currently, Web of Knowledge, IEEE Xplore, Jane's Online Research, Engineering Information (Ei) Compendex, and Business Source Corporate. These offer the library user an idea of (and link to) search engines other Sandians have found useful. But no reason to walk a path trod by many others; click "All Library Databases," immediately below the five most popular, and links to nearly 100 scholarly databases in a wide variety of scientific fields pop up. One can also crosslink search engines to improve chances of finding the desired item.

We've all been on websites where we wonder "What could they have been thinking?" when we reach some incomprehensible explanation or instruction. That is not the case here. The homepage column, "I need to . . ." links to ask a librarian (an immediate email form with addressee pops up), check my library account (I have two books out, one on hold, with all my Sandia locational data correct), and other "needs" that operate with remarkable quickness and ease. These include find a book, journal, report, article or database, research on a topic, standard or specification, or request a book the library doesn't own.

A strangely poignant section at the bottom of the homepage is MyLibraryShelf Beta. There, if you care to, you can enter the titles of books you own in your office. These then become available for loan to others who may want to read them. Someone sends a request (or you do), you (or someone else) puts the book in Sandia mail. It doesn't get any more small-town than this, like a 17th-century village in the wilderness exchanging treasured volumes among its citizens. Also provided in the same category is a more permanent book swap rather than the temporary loan.

Danielle Pollock developed the homepage with Carol Ou, Laura Calderone, Amy Rein, and Julie Hillskemper, under the leadership of Don Guy (all 9536). Danielle says that the library's former website had subject guides that were long and hard to use. The new model not only permits comments but enables RSS feeds that will send Sandians alerts from journals, so that the researcher can see in advance what a new issue will contain. There are also training sites and tutorials.

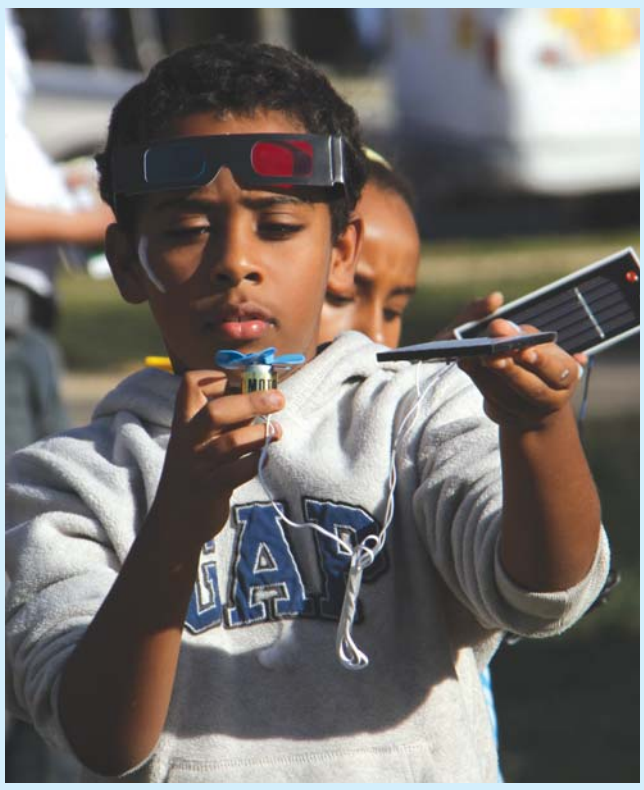
Check it out, and save Tinker Bell one more time.

Keeping science alive in the US

USA Science and Engineering Festival Rally inspires next generation

Story by Amy Tapia • Photos by Ray Ng

The USA Science and Engineering Festival Expo was held on the National Mall in Washington, D.C., Oct. 23-24. The mission of this first-of-its-kind festival was to reinvigorate the interest of America's youth in science, technology, engineering, and math by producing the most compelling, exciting, educational and entertaining science gathering in the US. The short version — "Rally to Keep Science Alive." The festival was hosted by Lockheed Martin. Several Sandians spent their weekend sharing with visitors how Sandia is securing a peaceful and free world through technology. The challenge for the team was to present technologies that visitors could experience, see, and touch. A variety of technologies were demonstrated, including aqueous foam, arm protection gauntlets, robotics, and solar energy. One of the favorites was Snarla, modeling the camera technology developed by retiree Richard Sparks and utilized in the aftermath of the 9/11 World Trade Center attacks. Richard travelled to the Washington event on his own to assist at the Sandia booth and talk with visitors about this technology. The festival concluded two weeks of activities in Washington and around the country. The Festival Expo included more than 1,500 interactive, hands-on exhibits, 75 stage shows, and several student contests.



Science Festival Team – Molly Glen (5220), Darline Polonis (3652), Marcia Espander (10659), Michial McDuffie (3654), Ray Ng (3655), Jose Luis Cruz Campos (17491), Cynthia Harvey-McDonald (5220), Richard Sparks (retired).

John Hogan honored with NNSA Administrator's Gold Award

By Bill Murphy

"Sometimes it only takes one great professor to change your life," says John Hogan. "I wanted to be that professor for other people so they could be of service to the nation." John was recently honored with the NNSA Administrator's Distinguished Service Gold Award. John was cited for his distinguished service in the national security of the United States, particularly for his significant contributions to DOE/NNSA's nuclear weapon-related education programs. The Gold Medal is the highest honorary award granted by NNSA, bestowed solely at the discretion of the administrator.

Among John's thousands of students over the past 16 years from across the nuclear weapons complex, DoD, and other federal agencies, was current NNSA Administrator Tom D'Agostino, who once had this to say of John's weapons classes: "You have no idea how much you have benefitted the nuclear weapons program. I took your class and I know. Many illustrations of your teaching and ways of explaining difficult technical aspects have been used in congressional testimony and on numerous other occasions to justify our nuclear weapons program."

D'Agostino himself was scheduled to present the administrator's award to John in person, but was called away by the secretary of defense just before the presentation. In his stead, Deputy NNSA Administrator for Defense Programs Don Cook — himself a former Sandia director — presented the award to John.

According to the award justification about John, the courses he built and taught "entail the most in-depth nuclear topics taught anywhere in the nuclear weapons community." People taught, mentored, and sometimes encouraged by John now hold positions at the highest levels throughout the US — in the White House, Congress, congressional staff, Department of State, DoD, DOE, NNSA, CIA, and the intelligence community at large.

John is the founder of the Sandia Weapon Intern Program and the New Hire Orientation Program. He ran the intern program for the first five classes and has been the principle teacher for all of classes in the program, now in the 13th class. John has made a deep impression on what now amounts to a full generation of students, who have called him, affectionately, Yoda and Gandalf the White, that last perhaps a comment on the color of his hair, but also perhaps because Gandalf was master of a set of invaluable, historical knowledge.

In his acceptance speech for the award, John said, "It is my hope that this wonderful award highlights one of the major challenges that all of the technical fields in the United States face, but especially the engineering and science disciplines that support the nuclear field — that is, getting new personnel and then training the next generation. For many reasons, including lack of defined projects and funding, there is one whole generational gap between many of us of retirement age and the new work force. I have been on a personal crusade for 16 years, trying to prepare those responsible for today's stockpile but more importantly, training the future stewards of our greatest deterrent, nuclear weapons."

John called people the "limited life component in nuclear weapons," and suggested the investment in the human component is far less expensive than investment in new infrastructure. He offered up, more than half-seriously, something he called "the inverse law of office niceness." According to his law, John said, "the higher the challenge the lower the niceness of the office space requirements. Temporary buildings and tents work fine if the stakes are high enough. The corollary is that the more we seem to want better trappings, the lower the challenge. The focus is clear — it should be the people and giving them a challenge."

DISTINGUISHED SERVICE — Don Cook, deputy NNSA administrator for Defense Programs, presents John Hogan, founder of the Sandia Weapon Intern Program, with the NNSA Administrator's Distinguished Service Gold Award for distinguished service in the national security of the United States.

John was part of the Martin Marietta bid team that won the DOE contract in 1993 to manage Sandia and also served on the Martin Marietta transition team. He formally joined the Sandia staff in 1994 at the specific request of Labs weapons educator Dick Brodie. Dick, deeply impressed with John's seemingly bottomless knowledge about both the technical and geopolitical aspects of nuclear weapons, strongly wanted John to assume leadership of the weapons-related education program Dick had taught for 14 years. John moved his family from Orlando, Fla., to Albuquerque, where his career took a turn that was at once welcome and perhaps even unexpected.

> *"I do not know of anything that would fulfill [Churchill's] requirement, so until we find that thing we need to keep the one thing that has prevented a major war for 65 years — the ultimate deterrent."*
>
> **— John Hogan**

John acknowledged in his acceptance of the NNSA award that "I did not wake up one day with teaching as my mission." But he recalled being inspired by a great teacher, Professor John Meason from University of Arkansas (now head of EMERTEC at New Mexico Tech). Meason, John said, "saw a glimmer of hope in me and helped me love all things nuclear and then go on to grad school." Meason, as well as other mentors from throughout John's career including Labs Director Paul Hommert, attended the awards ceremony to help celebrate their colleague's recognition.

While John may not have started out with an idea of being a teacher, it was at Sandia that his late-blooming love affair with passing on knowledge to the next generation came to full flower.

When he signed on at the Labs, John recounted, then-VP Roger Hagengruber gave him "some very simple instructions — 'Focus your attention on the people. Train the next generation. Set up programs and classes that will make people want to come. Your measure of success will be if people fight to get into them.' With over 5,500 students for the three-semester-hour course and hundreds always in backlog, and the longest-running educational program at Sandia — the Weapon Intern Program, with over 250 graduates and now in its 13th class — Roger would be pleased, I think."

John emphasized that during his 16-year teaching career at Sandia, knowledge transfer has gone both ways. "I have had the pleasure of learning from friends throughout the nuclear weapons community and I have learned a lot from the students. My greatest pleasure comes from seeing them succeed, bragging about them, and even more so as the students become my teachers."

After praise and thanks to members of his immediate family for their support over the years, John ended his remarks at the awards ceremony on a cautionary note, quoting Winston Churchill's last address to Congress. Said Churchill: "Be careful above all things not to let go of the atomic weapon until you are sure, and more than sure, that other means of preserving the peace are in your hands."

"I do not know of anything," John said, "that would fulfill [Churchill's] requirement, so until we find that thing, we need to keep the one thing that has prevented a major war for 65 years — the ultimate deterrent."

IN THIS ICONIC IMAGE from the Cold War era, observers (in photo at left) wear special goggles as they watch the Operation Greenhouse Dog above-ground nuclear test from the Officers Club on Peary Island in the Pacific Proving Grounds in 1951. In the photo at right, Lt. Col. Mark Glissman, a former student in the Weapon Intern Program and a guest speaker at John Hogan's award ceremony, Don Cook, and John don vintage goggles used during the above-ground nuclear test program. John had brought along the goggles to honor the legacy of the nation's weapons program.

Executive VP Al Romig wins the 2010 Governor's Distinguished Public Service Award

By Chris Miller

Executive VP Al Romig is one of 12 New Mexicans selected to receive the 2010 Governor's New Mexico Distinguished Public Service Award.

On behalf of Gov. Bill Richardson, former New Mexico governors Garrey Carruthers and Toney Anaya will present the awards Nov. 16 at the 41st annual New Mexico Distinguished Public Service Awards Banquet in Albuquerque.


AL ROMIG

The awards recognize "outstanding contributions to the public service and to the improvement of government at all levels by both government employees and private citizens," according to information provided by the governor's office. Awards are given in four categories: federal government and national laboratories; state government and universities; local and American Indian governments; and business and civic.

Technology Ventures Corp. in Albuquerque nominated Al for the award in the category of federal government and national laboratories. "Al consistently demonstrates national over DOE over Sandia over self as a strongly held personal value," according to the nomination. "He expects quality work of himself and motivates others to achieve at their highest potential."

"I'm delighted and honored to be selected for an award that recognizes public service," Al says. "I've always been passionate throughout my career about serving the nation through the important work we do at Sandia, and about giving back as much as possible to our community."

Al has been instrumental throughout much of his 31-year career at Sandia in developing and driving the Laboratories' science base, technology transfer program, and business development as Sandia expanded its Work for Others program. Al also had important roles in the planning and completion of the $500 million MESA (Microsystems Engineering Sciences and Applications) complex, the largest project ever undertaken at Sandia. He also helped spearhead the Sandia Science & Technology Park, a 250-acre campus-like business park adjacent to Kirtland Air Force Base that currently consists of 31 companies employing more than 2,000 people.

The nomination cited Al's recent leadership in reducing Sandia's overhead costs through the management of indirect services. "He then applied processes to create a culture of leanness and reduced complexity. These efforts, coupled with an instituted austerity program, led to costs savings and cost avoidance of $25 million," according to the nomination.

Al has long been active in serving the local community. He is the current chair of United Way of Central New Mexico and has served on the organization's board for the past 10 years. He serves on the board of the MIND Research Network, an independent nonprofit organization dedicated to advancing the diagnosis and treatment of mental illness and other brain disorders.

Al also serves on the board of directors for Technology Ventures Corp., a nonprofit company founded to help commercialize national laboratory technologies. According to the nomination, his guidance and intimate familiarity with the labs has helped TVC create 112 new businesses, secure more than $1.15 billion in investments, and generate close to 13,500 high-tech jobs in the state.

Al contributes significantly to the community through his support and participation in Sandia's community outreach programs. The programs help improve K-12 education and assist students, who through hard work and determination, overcome personal difficulties to achieve their goals.

Cancer center

(Continued from page 1)

and UNM professor Jeff Brinker's (1002) research, which is devoted to nano-biomaterials and nanomedicine. UNM donated more than 4,500 square feet of lab space in the new Centennial Engineering Building for the project. Construction is scheduled to begin December 2010.

"Sandia is proud to be a part of this important undertaking," says Steve Rottler, Chief Technology Officer and VP of Science and Technology and Research Foundations Div. 1000. "Pairing Sandia's expertise in materials science with UNM Cancer Center researchers' knowledge of cancer biology, oncology, and clinical attributes provides an ideal setting in which to move forward in our nation's fight against cancer."

Second phase of alliance

The awards comprise the second phase of the NCI's Alliance for Nanotechnology in Cancer Program, which initiated an investment of more than $30 million per year for the next five years to establish Centers of Cancer Nanotechnology Excellence, Cancer Nanotechnology Platform Partnerships, training grants, and the Nanotechnology Characterization Laboratory. The alliance was founded in 2004 to leverage specific advantages of nanotechnology to improve cancer diagnosis, treatment, and prevention. Since then, the alliance has facilitated the discovery of many novel technologies, some of which are currently undergoing commercialization and clinical trials.

"The technology I developed with now-Truman Fellow Carlee Ashley [8621] and UNM colleagues is really a generic platform to target any arbitrary cancer, so we've already written other proposals and are interacting with other cancer research centers throughout the US and Canada, to go after low-outcome cancers like breast, lung, pancreatic, and liver."

— Sandia Fellow Jeff Brinker

Jeff, who is coprincipal investigator on the grant with Dr. Cheryl Willman, a physician and director and CEO of the UNM Cancer Center, and a Distinguished Professor of Chemical and Nuclear Engineering at UNM, used a Sandia-funded Laboratory Directed Research and Development grant to conduct preliminary research in nanofabrication. The nanostructures he developed form the basis for delivering drugs directly to a wide variety of cancer targets, a method that increases the drug's effectiveness and reduces side effects.

Targeting any arbitrary cancer

"The technology I developed with now-Truman Fellow Carlee Ashley [8621] and UNM colleagues is really a generic platform to target any arbitrary cancer, so we've already written other proposals and are interacting with other cancer research centers throughout the US and Canada, to go after low-outcome cancers like breast, lung, pancreatic, and liver," Jeff says.

Jeff is also a team leader in the Cancer Nanotechnology Training Center, which is focused on training multidisciplinary scientists at both Sandia and UNM. One such student, Carlee, started working as an undergraduate student in Jeff's lab in Sandia's Advanced Materials Laboratory. Jeff then served as her graduate coadviser with David Peabody of UNM, and Carlee recently earned one of Sandia's prestigious Truman Fellowships.

"Carlee's experience was the model for the training grant. Her work was used as the basis for what we'd like to do in the future," Jeff says. "She went from biochemistry to training in my lab and then chemical engineering. That kind of interdisciplinary training is something that Sandia and UNM are actively encouraging."

The next five years of the NCI's Alliance program will focus on rapidly advancing new nanotechnology discoveries and speeding their transformation into cancer-relevant applications in clinical practice; aiding nanoparticle characterization and standardization of characterization methods to enable technology transfer from university laboratories to companies that bring these technologies to patients; and developing the next-generation of cancer researchers in the area of nanotechnology.

Making a difference in the community

LENDING A HAND FOR THE COMMUNITY — More than 200 Sandia employees, contractors, retirees, family members and friends spent several days during October as part of the nationally observed "Make a Difference Day." Sandia volunteers pitched in on projects throughout the community. Sandians were everywhere; they supported the Mission of Mercy event where thousands of patients received free dental services, helped do a playground makeover at Martineztown House, helped with a landscape project at Adelante Development Center, prepared food boxes for seniors at Roadrunner Food Bank, painted a participant day room at Cornucopia Adult Day Services, repainted the striping in the parking lot of the thrift shop for the Assistance League of Albuquerque, did garden maintenance at the Albuquerque Rose Garden, and made quilts for newborns of members of the military.

July Emcore tragedy sparks focus on workplace safety at Sandia

Concerns of Sandians located outside Kirtland Air Force Base are focus of all-hands hosted by Paul Hommert and Mike Hazen

LABS DIRECTOR PAUL HOMMERT, left, and Div. 4000 VP Michael Hazen discuss concerns about workplace safety and security during a recent Labs-wide briefing. (Photos by Randy Montoya)

The Emcore shooting in July that claimed two lives and left several Emcore employees injured was tragic for that company and its workers; the incident also raised issues about the safety and security of members of the Sandia workforce who work in facilities at Sandia Science & Technology Park and other locations outside Kirtland Air Force Base (KAFB).

To address those issues directly, Labs Director Paul Hommert and Div. 4000 VP Michael Hazen, whose responsibilities include management of the Labs' safety and security organizations, conducted a Labs-wide briefing on Sandia's ongoing response to the Emcore shootings.

"We need to continue to dialogue with you and communicate back on some of the questions you've raised. I urge you to hang in there with us and keep raising your concerns."

— Paul Hommert

Paul told attendees at the Steve Schiff Auditorium and hundreds of Sandians who watched the session on live streaming video that the shooting tragedy precipitated a deep look at safety and security issues, particularly as they apply to off-base personnel and facilities.

"In the immediate wake of the shooting," Paul said "I committed to come back somewhat separated in time from the event to engage in a lessons-learned dialogue and to understand the implications for how we operate facilities off base. . . . [and] an important part of the learning process for me is to hear directly from you."

In an unscripted presentation backed by PowerPoint slides, Michael called the Emcore experience and Sandia's response to it "an extraordinary learning experience for me." In the immediate wake of the incident, he said, Sandia's post-recovery medical team talked to 350 people. Those interviews and subsequent follow-on investigations have identified the perception among off-KAFB members of the workforce that "being outside the fence is different," and "a perception that they don't feel as safe and secure" as their on-base colleagues, Michael said.

Safety and security — and the *sense* of safety and security — should be the same for all members of the workforce regardless of where they are physically located, Michael said. Sandia's post-Emcore preparedness actions, he said, are aimed at ensuring that those perceptions are fully addressed.

Citing published data, Michael said there are two million workplace violence incidents in the US each year, adding that evidence suggests the individual incidents are becoming more violent. "This is clearly an issue that warrants our attention," he said.

The Emcore shooting was not a matter of a person "snapping that morning," Michael observed. "That incident started a long time before. We need to also recognize that there may be somebody who's working right beside us that we could help before they got to the point where we'd have that high-consequence event."

Sandia has many resources in place to help troubled individuals, Michael said, adding that timely intervention, perhaps involving fellow workers, could help avert a tragedy.

Michael discussed a number of specific actions that have been taken since the shooting. Among them:

- An emergency management critique was held and corrective actions identified.
- Sandia's preparedness and response actions to an active aggressor were reviewed.
- Building evacuation teams were strengthened.
- Thirteen new tone alert radios at IPOC and three at the International Programs Building (both facilities located in Sandia Science & Technology Park near the Emcore facility) were installed.
- Evacuation and shelter-in-place drill plans were established.
- Communications between the city of Albuquerque and Sandia's Emergency Management team were improved.

Michael also cited work in progress intended to ensure workplace safety and emphasized that his team and the Labs leadership is committed to improved and frequent communication regarding issues of workplace safety and security.

He encouraged Sandians to attend a violence in the workplace seminar sponsored by the Albuquerque Police Department that will be held Nov. 16, 2-4 p.m., in the Steve Schiff Auditorium. The seminar, he said, will offer valuable insights into how every member of the workforce might help mitigate a low-probability but high-consequence and tragic incident.

"We need to continue to dialogue with you and communicate back on some of the questions you've raised," Paul said. "I urge you to hang in there with us and keep raising your concerns."

Paul and Michael committed themselves and the Labs to continuing to listen and respond to the concerns raised by members of the workforce.

The streaming video of the presentation by Paul and Michael is available at http://tiny.sandia.gov/vdb9x.

"We need to also recognize that there may be somebody who's working right beside us that we could help before they got to the point where we'd have that high-consequence event."

— Michael Hazen

Corporate Investigations has seen 60 percent increase in reported incidents of workplace violence

By Adriana Gronager

In the wake of the tragic shooting at Emcore last summer, employees in businesses throughout the community, including Sandia, have become more aware of workplace violence, says Chris Padilla, senior manager of Corporate Investigations Dept. 920.

This year, Chris says, Corporate Investigations has seen a 60 percent increase in reported workplace violence incidents at Sandia compared to 2009. There have been 10 reported incidents in 2010, six of which have been substantiated. Why the increase? According to Chris, there is no definite answer.

"There is a possibility that employees are more aware of where and how they should report incidents and they are no longer afraid to do so," Chris says.

The most common type of workplace violence incident Corporate Investigations sees, Chris says, is employee-on-employee bullying. Managers, he says, need to be aware of what's going on among the people in their organizations. "They're the decision makers," Chris adds. "They're the ones who need to set the tone and expectations about what constitutes acceptable and unacceptable behavior."

If the behavior continues despite the manager's efforts to intervene, the employee(s) and/or manager need to contact Corporate Investigations.

"When there are over eight thousand employees in one company, you're going to have issues with some not getting along with others, and we're not the only lab seeing the increase," Chris says. "But we are committed to do everything we can to ensure that Sandia is a workplace where people can feel safe and secure as they do important work for the nation."

Sandia is taking steps in addressing ways to handle workplace violence. A class developed by the Albuquerque Police Department (APD) will be held Nov. 16, in the Steve Schiff Auditorium from 2 -4 p.m. The class will be videostreamed to all facilities.

Two sergeants and one psychologist from APD will speak and will answer questions about workplace violence, domestic violence, and active-shooter scenarios. Sandia is also looking at incorporating some new training developed by Lockheed Martin that addresses workplace violence. The annual training will be mandatory for all employees.

'We are all one country, we are all one people'

By Iris Aboytes

Yvonne Batchelor (2993) joined the Women's Army Corps (WAC) to honor the maternal grandparents who raised her.

She attended basic training at Ft. McClellan in Alabama. Yvonne was in the last trial class — a class that took the same basic training courses as the men — before basic training became integrated.

After her initial training, she went to Ft. Huachuca, Ariz., where she attended Military Occupational Specialties (MOS) training and became a military intelligence analyst. She was then sent to the 207th Military Intelligence (MI) Detachment at 7th Corps Headquarters, Stuttgart, Germany. She was one of the first 14 MI WACs stationed in the European theater.

In Germany, Yvonne examined Warsaw Pact reports of both military and civilian movements and, analyzed the information to see if it had an impact on NATO forces in Europe.

"I was raised by Nasbah and Richard Thomas, whom I called mama and daddy. Mama did not get the opportunity go to school," Yvonne says. "She was the oldest in her family and was kept home to tend the sheep and livestock. She did not speak or understand English, but she was a woman before her time.

"She would tell us, 'You need to learn to read, write, and speak English as well as, or better than, an Anglo because everything is in books. If you can read, you can be and do anything.' She was adamant about a good education being the key to success. My joining the Army to financially help my family, serve my country, and guarantee myself an education was a way that I could honor my mama's and daddy's wishes."

"Daddy was a Navajo Code Talker," she adds. "In July 2001, the first 29 Navajo Code Talkers received the Congressional Gold Medal in Washington, D.C. Daddy and the other 28 set up and taught the code.

"With pride, he would tell us stories about what it meant to be a Code Talker. He made us laugh when he would tell us about how the military was skeptical at first because they did not think the Code Talkers were taking enough time to interpret the messages. At the time, messages would take a minimum of 30 minutes to encrypt and send. The Navajo code was much more efficient, taking fewer minutes to encrypt and send. So what the Code Talkers did, instead of stopping after delivering the message, is continue talking for several minutes longer. They asked about each other, friends in the war, their families, and catching up on news from back home. The added time made them credible. Daddy would laugh, saying, 'It's funny, the military wanted us to be accurate and fast, but not *too* fast.'

"Although not considered citizens until 1924 and not having the right to vote until 1948, our people served in the military during both world wars," says Yvonne, "But daddy said it did not matter. 'We are all one country, we are all one people,' he would say. 'Some might not have been born here, but are of us now.'"

Her grandparents' teachings made joining the military a logical choice. The Army provided housing and meals, so most of her military pay could be sent home. The GI Bill allowed even the very poor to go to college. And she wanted an education above all else.

"I was in the military for a little more than a year when I was discharged because of pregnancy," says Yvonne. "At that time, a woman could not remain in the service if she got pregnant. However, shortly after my discharge, I found a way of serving in a civilian capacity."

MAKING A GRADE — Yvonne is promoted to Private First Class in this 1973 photo.

Through the 7th Corps' Judge Advocate General's office, Yvonne worked with the military for the remaining 3 1/2 years in Germany, where she helped other service people whose language of origin was Navajo.

"The culture shock from reservation life to off-reservation life when you can't speak American English very well was difficult enough," says Yvonne, "but moving to a foreign land and having to learn yet another language and culture was unbearable for many. They isolated themselves, withdrawing into depression and frustration. That resulted in alcoholism spilling over with all the ensuing behavior."

She testified to help the courts understand this culture shock to facilitate and/or mitigate the court's ruling.

Yvonne married while she was in Germany. When she called home to tell her family that she was getting married, she was worried what her grandfather would think because of his role in World War II. Her then-to-be husband was Japanese, a naturalized American. She had no reason to worry. His response was, "Did you tell him we're Americans?'"

CODE TALKER — Richard Thomas, Yvonne Batchelor's grandfather, was one of the original 29 Navajo Code Talkers and received the Congressional Gold Medal in July 2001.

November is American Indian Heritage Month
Nov. 11 is Veterans Day

Beverly Manuelito served in the Army as a gift to her father

By Iris Aboytes

When Beverly Manuelito (5917) was in basic training at Fort Jackson, S.C., "What was I thinking," crossed her mind several times. "The daily training exercises exerted my body to the point of exhaustion, and the humidity was unbearable," she says. Beverly served in the US Army for five years and in the reserves for 10 more.

Beverly did not have any brothers, so she became her father's little tomboy. "Daddy had served in the Korean conflict, so I enlisted to be just like him," Beverly says. "He was so proud.

BEVERLY MANUELITO

Manuelito, the surname of the greatest war chief of the Navajo Indians, comes from a long line of warriors, most notably her father, Bill Manuelito, who served during the Korean War.

Beverly was an advanced individual trainer personnel specialist. She was stationed with the 574th Personnel Company in Hanau, Germany. "We dealt with all retirements, awards, visas, passports, and all human resource actions," she says.

"I was fortunate to be spared the horrible experiences of war. I was stationed in West Germany and in the homeland, not the deserts of the Middle East. My husband thinks of me as his hero, his little sergeant," she says with a chuckle.

"I missed home and my parents, but it was great living in a different culture," Beverly says. "I was able to tour and explore the countryside. The German people were very friendly."

From Germany, Beverly went to Walter Reed Army Medical Center in Washington, D.C. She worked to make sure all Purple Hearts and other awards were issued when they were requested.

"Civilians don't get to see the effects of war by walking through the halls of Walter Reed," she reflects. "Some days, you just don't want to go to work knowing there are new admissions of soldiers each day, many with brain injuries, PTSD [post-traumatic stress disorder], missing limbs, and other disabilities. There was one fella who kept asking for his bomb-sniffing dog. He asked me to help him find his dog. It was real heartbreaking.

"For decades, the military was the only way for American youth to enrich their lives," she adds. "The recession was in full swing in the1980s. The economy was much worse than what it is today. There weren't any jobs available."

Beverly's dad was born and grew up on the Navajo Reservation in Newcomb, N.M. "The dusty little community is 20 miles south of Shiprock," says Beverly. "He didn't want to stay there; he wanted to travel and see the world, so he enlisted in the Army."

Beverly's father retired from the *Houston Chronicle* as a pressman. "He was a natural storyteller," she says. "I loved hearing about all his experiences.

"I know from experience that not all servicemen and women get the chance to start a family or build a career following their pursuits of happiness," she says. "Even now I cringe when I read about another soldier getting killed or hurt. We are continually given the ultimate gift – their lives."