

A new twist on botulinum testing

By Patti Koning

The botulinum toxin, caused by the bacteria *clostridium botulinum*, is the most toxic substance known to man — a minuscule quantity can deliver a lethal dose. Despite remarkable scientific advances, laboratory mice remain the only reliable means of testing for botulism.

“The mouse bioassay is primitive, but remains the gold standard due to its sensitivity,” says Greg Sommer (8621). “Our SpinDx botulinum assay vastly outperformed the mouse bioassay in head-to-head tests, and requires absolutely no animal testing. Plus there are a lot of advantages in terms of cost and speed. Our test can be run in under 30 minutes, compared with days for the mouse bioassay.”

“This isn’t an assay with a large commercial market, therefore it’s not something that industry is going to take on. So this is where we, as a national lab, step in and fill the gap.”

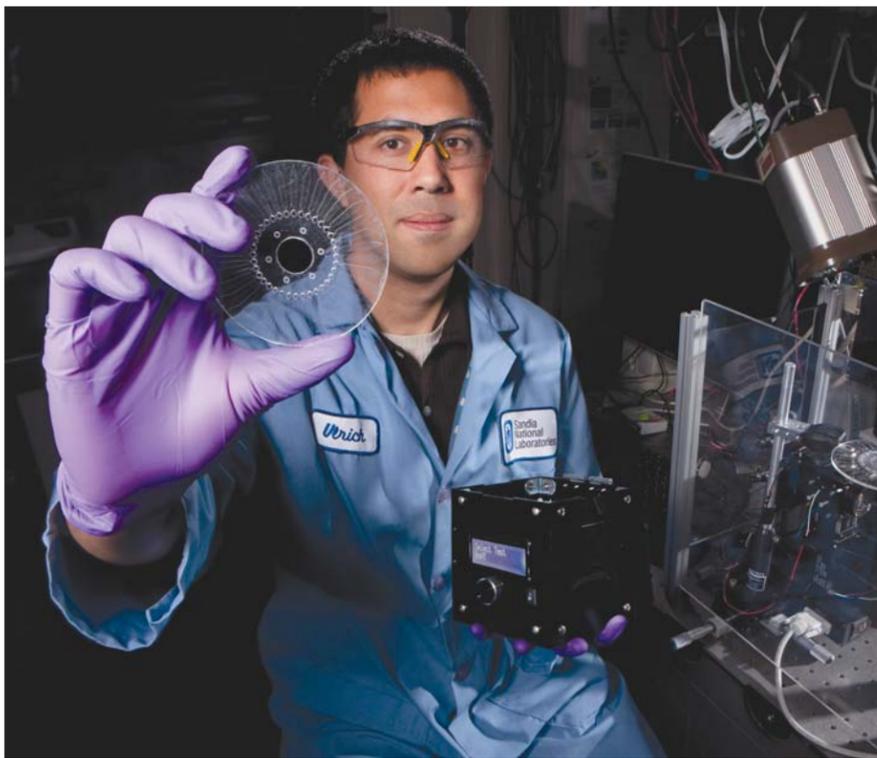
Sandia researcher Greg Sommer

The botulinum assay uses the same lab-on-a-disk platform (SpinDx) as the radiation biosimeter developed by Greg, Ulrich Schaff, and Chung-Yan Koh (both 8621). That device can perform protein measurements, white blood cell counts, and DNA testing, giving a rapid and detailed picture of radiation exposure (see *Lab News*, May 6, 2011).

The project received National Institutes of Health funding to adapt the lab-on-a-disk platform for toxin diagnostics. While botulism is quite rare — only about 145 cases are reported in the United States each year, according to the Centers for Disease Control and Prevention — the lethality of the toxin makes it an attractive candidate for bioterrorism.

“A very small amount in the food system could harm a lot of people,” says

(Continued on page 3)



DISK JOCKEY — Ulrich Schaff holds a prototype SpinDx, a portable instrument for running assays for toxins and other substances. The SpinDx botulinum assay outperformed the current “gold standard” botulinum test, mouse bioassays, and has the potential to become a powerful biodefense diagnostic tool. (Photo by Randy Wong)

Legacy waste program wraps up



As DOE’s Legacy Transuranic Waste Program nears its end at Sandia, workers at the Labs prepare the last load of Remote-Handled Transuranic Waste to be shipped from Sandia to the Waste Isolation Pilot Plant facility in Carlsbad, N.M. **Photos on page 7.**

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Mentoring at Sandia: It takes many forms

By Sue Major Holmes

Sandia/California Senior Manager Howard Hirano (8110) makes himself available to people who need help or guidance, formally or informally. He holds occasional casual brown bag sessions, where anywhere from a handful to up to 10 staff members gather to discuss whatever they want.

“I learn a lot about what people are thinking about as problems, what are the issues, what they’re worried about. I also learn about projects,” he says. “It helps me as much as any help I provide to any individual.”



“I’m delighted that we have such a strong mentoring culture at Sandia. Mentoring is a vital part of professional development, particularly here at Sandia, where we have such a critical national security mission.”

Executive VP and Deputy Labs Director for Mission Support Kim Sawyer

Howard, one of 102 people nominated as outstanding mentors at Sandia this year, is part of a long-time mentoring culture at Sandia that includes innumerable permutations: people who mentor several others, individually or as a group; Sandians who have more than one mentor; junior staffers mentoring senior staffers; peers mentoring each other; formal structured mentorships, and more informal relationships.

(Continued on page 4)

Sandia named semifinalist for Freedom Award for support of Guard, Reserve members

By Sue Major Holmes

A big white banner above Andy Anderson’s computer in his office at Sandia’s International Programs Building reads, “Welcome Back, Andy. Thank you for your service to the United States in our Armed Forces and for protecting our Freedom. We’re glad to have you back at Sandia.”

The sign, organized by the Labs’ Military Support Committee and signed by Andy’s coworkers, is just one demonstration of the support Sandia gave Andy (6811) and his wife, Ellen (1500), when he was deployed as a colonel with the Air Force Reserve to Afghanistan for nine months beginning last July.

Even while he was still overseas, Andy and Ellen nominated Sandia for the

(Continued on page 5)



The race is on

Every year, mechanical engineering students at the University of New Mexico build a serious race car. And every year, Sandia’s Imane Khalil, an adjunct professor at UNM, guides them to the heart of the job — the engine. See the story and photos on **page 6.**

Inside . . .

- Labs honors volunteers at annual breakfast 2
- Event highlights science/business partnerships 8
- Old robot gets new life at New Mexico Highlands 8
- Moving security beyond a cost of doing business 9
- Tameka Huff is a “Woman on the Move” 10
- Giving a boost to Albuquerque Heading Home 10



Habitat No. 12

For the 12th year running, Sandia volunteers are pitching in to build a Habitat for Humanity home for a partnering family. Help is still needed on this year’s project. For details, see the story and work schedule on **page 12.**

That's that

In the news media, the AP stylebook represents something close to Holy Writ. It provides guidance and sets the standard for such issues as when to capitalize titles, how to refer to dates, what's the proper way to use further and farther, lay and lie, and just countless other common and not-so-common language usage questions. This is important in the news media, because you want your publication to have some consistent way of presenting information.

At the *Lab News* we use a hybrid style: Most of our usage conventions are based on AP style, some of what we do is our own, and some we get from the *Chicago Manual of Style*.

When I don't know what else to do, I defer to AP's guidance. As the saying goes, nobody ever got fired for choosing IBM. Likewise, an editor can hardly be faulted for going with AP style. As such, I keep a copy of the stylebook close at hand and AP's online guide bookmarked for easy access. I refer to it for one thing or another almost every day.

As part of its online subscription service, AP sends out periodic updates that address new language issues: This is how to spell al-Qaida. Always capitalize "Internet," but lowercase "website" and make it one word.

The updates also sometimes provide guidance that reflects the changing, dynamic nature of the language. The most recent was jarring for this old journalism school graduate. According to AP, it's okay now to use the word "hopefully" in sentences like, "Hopefully, I'll get a new car this year."

My old J-school profs are either rolling their eyes or rolling in their graves. For them, "hopefully" didn't mean "it is to be hoped." It meant "in a hopeful manner." And that's all it meant.

I vividly remember one prof reading a student's Reporting 101 news story aloud to the class. When he came to that dreaded word, he'd rail, "Hopefully? Hopefully?! That's the mark of a cub!" (As in cub reporter, about the worst thing you could be, even if you were a cub.) I never quite got what the objection was to the other (let's face it) more common usage. I just knew it was bad.

His was a hard lesson to shake, let me tell you. And not just for me. A colleague in my office with a background in the news media responded to that new AP guidance with disdain. She wrote to me: "I saw AP's endorsement of 'hopefully,' and see it as another example of a proud institution sliding down the slope. I hope (proper usage) I never use that word." To which I replied, "Hopefully, I won't either." Wise guy.

* * *

Did you see where there's a move afoot – not sure how far along it is – to get rid of the penny? The proud old penny, the shiny penny, the one-cent piece that's been part of our currency since we established the US Mint in 1792.

A good case can be made that the penny is obsolete – and expensive. According to folks who keep track of these things, most people don't really "spend" pennies. They collect them as change and then toss them in a jar somewhere. There are probably billions of the things sitting on people's shelves, mine included. Vending machines don't take pennies, so you can't use them there. Most to the point, though, is that the actual cost to produce a penny is now 2.41 cents.

Critics of the penny (can you think of anything less consequential to get passionate about?) argue that it just doesn't make sense to spend more producing a coin than it's worth. True, but champions of the penny – and some of them seem to be pretty passionate, too – are convinced that the end of the penny will mean rounding up or down to the nearest nickel, with most merchants opting to round up. In other words, it's gonna cost us.

It so happens I have some experience with this. In New Zealand, which I visited recently, the currency is the New Zealand dollar and smallest coin is the dime. Prices are still based on cents, though, so you'll see things priced \$1.99 or \$3.59 or whatever. The rounding to the nearest dime only occurs when all the prices are added together and is as likely to come out in favor of the buyer as of the seller.

Either way, we're talking a few cents here, people, and there has never been a time in US history where a coin was worth as little – in buying power – as today's one-cent piece.

Every rational bone in my body says the penny ought to go, but I've been around long enough to know that public policy in this country isn't always based on what's rational. And there is a part of me that wonders, in a penniless world, how much is my two-cents' worth worth? A penny for your thoughts.

See you next time.

– Bill Murphy (505-845-0845, MS 0165, wtmurph@sandia.gov)

Sandia Serves Volunteer Breakfast

By Stephanie Hobby

Sandia honored the efforts of Sandia employees, contractors, and retirees who selflessly donate their time and talents to better the community at the annual Sandia Serves Volunteer Breakfast on April 19.

This year, roughly 1,000 Sandians logged more than

"Volunteering is an integral part of Sandia's culture, and we are so proud of the tremendous impact our employees have on our community."

— Pam Hansen Hargan
Human Resources & Communications Div. 3000 VP

108,000 volunteer hours doing things like building houses, reading to children, and judging science fairs. To put that in perspective, 108,000 hours is about 12 years and four months.

Human Resources & Communications Div. 3000 VP Pam Hansen Hargan opened the breakfast by saying how important volunteers are to Sandia's community outreach efforts. "Volunteering is an integral part of Sandia's culture, and we are so proud of the tremendous impact our employees have on our community," she said.

Dina J. Ma'ayan, the development director and a counselor from PB&J Family Services, was this year's guest speaker. PB&J is a local organization that helps at-risk children grow and develop their full potential in nurturing families within a supportive community.

Ma'ayan discussed the importance of volunteering and its impact on the community, and specifically thanked Sandia volunteers for their service, because they are known problem-solvers.

Nearly 300 Sandians earned the President's



VOLUNTEERS Yvonne Petrova (10508) and Hy Tran (2541) participate in Sandia's annual Sandia Serves Breakfast, which honors hundreds of Sandians who donate their time to better the community. (Photo by Rachel Baros)

Volunteer Service Award, which recognizes individuals, families, and groups who have volunteered more than 100 hours. The program is run by the President's Council on Service and Civic Participation, which was established by executive order in 2003 to encourage each American to donate more than 4,000 hours, or two years of their lives, to service.

In addition, 102 Sandians received the Community Service Award, which is presented to volunteers who donate more than 100 hours of service to one organization in a calendar year.

Sandia developed the award program to provide financial support to nonprofit agencies where Sandians serve. Recipients are eligible to earn between \$100 and \$500 for the agency they serve. The amount of the financial award depends on the number of hours volunteered.

"We are always overwhelmed by the generosity of our employees who give of their time, talent, and resources," says Patty Zamora (3652) who coordinates the breakfast. "This is one way to recognize that and let them know we're grateful for all they do."

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Botulinum testing

(Continued from page 1)

Greg. "This isn't an assay with a large commercial market, therefore it's not something that industry is going to take on. So this is where we, as a national lab, step in and fill the gap."

There are several reports of botulinum having been weaponized by terrorists and nations at war, most notably by terrorists in Japan in the early 1990s as well as by Iraq during the Persian Gulf War. While the toxin has not yet been successfully deployed as a bioweapon, those working in national security are trying to get ahead of the problem with vaccines and therapeutics, as well as diagnosis and prevention. Additionally, botulinum is being used more frequently for therapeutic and cosmetic uses (Botox), creating greater risk for misuse.

Remarkably simple platform

The goal, says Greg, is to create a handheld, point-of-care device that can be used in the field by emergency responders. The SpinDx platform has several advantages for such a scenario. For one, it's remarkably simple.

The device works just like a CD player, using a spinning disk to manipulate a sample.

"You just mix your sample and spin, says Ulrich. The device is very reproducible and reliable."

Another advantage is the ability to process samples in virtually any form, which is especially important when testing for a food-borne toxin. If you prepare your sample correctly, this device can read it, says Chung-Yan.

In a recent demonstration, he was challenged to test what was basically a continental breakfast — milk, half-and-half, yogurt, honey, hot chocolate mix, cinnamon, canned meat, peanut butter, and a raspberry vinaigrette salad dressing. "Milk and honey are difficult because they are viscous and opaque, plus honey has bee proteins that can interfere," he adds. "Foods with a lot of fat — again, milk as well as peanut butter — are also traditionally hard to work with."

Through a lot of trial and error, Chung-Yan made improvements to the assay that enabled it to handle thick, viscous food substances and increased its sensitivity under these challenging conditions. Collaborators at the USDA provided high-quality botulinum antibodies that bind with high affinity, enabling the higher sensitivity.

That ability to process so many food substances makes the device relevant for food safety testing. About 15 percent of botulism cases are food borne, usually related to home canning. In 2007, 14 people in seven states contracted botulism from hot dog chili sauce due to faulty manufacturing equipment at a food plant in Augusta, Ga.

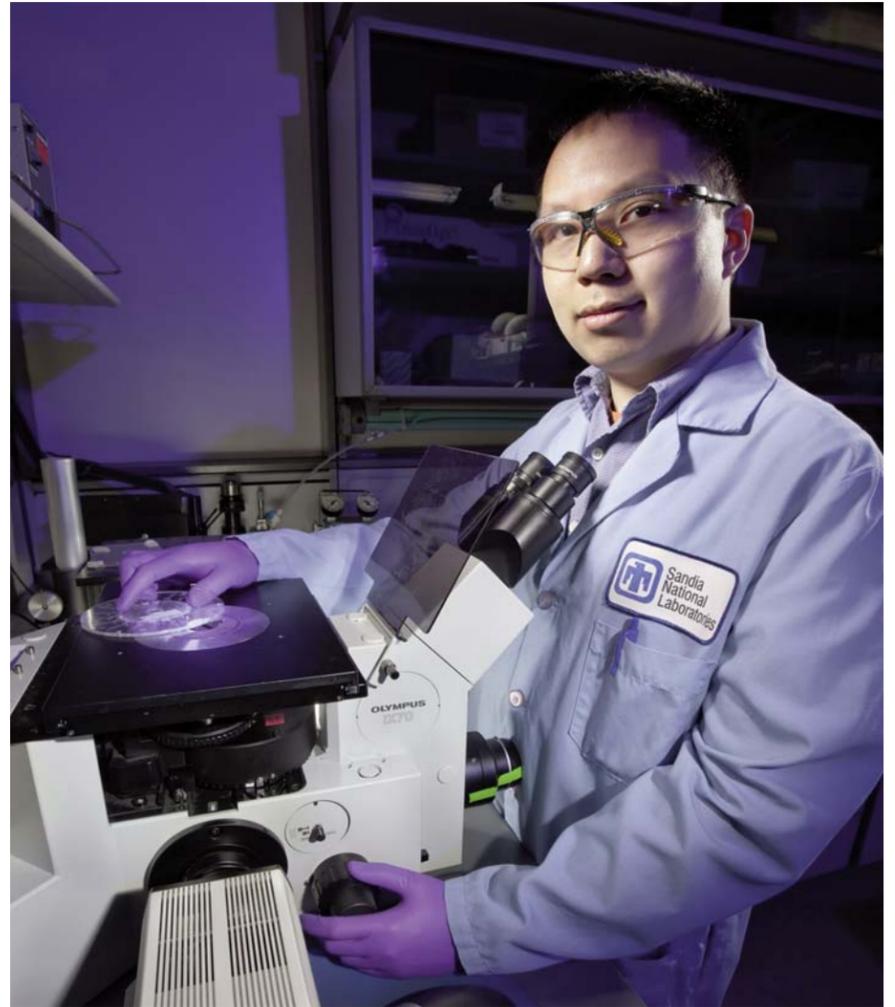
"Food processing plants are looking for something that can be integrated into their assembly lines," says Greg. "Our device will be suitable because it's fast, inexpensive, and simple to operate."

Tip of the iceberg

But botulism is just the tip of the iceberg. With proof-of-concept on the botulinum toxin, the team is turning its attention toward other toxins as well as pathogens, bacteria, and viruses. While the focus is on biodefense, Greg also sees the SpinDx device becoming a regular medical diagnostic tool.

"Ideally, this device would have a routine clinical application so medical personnel use it regularly," he says. "The disks are consumable and assay-specific, so in an emergency you would just switch to the right toxin disk."

The team is currently developing a deployable prototype to run the assays. The goal is a fully integrated, automated device ready for field testing.



CHUNG-YAN KOH prepares to read the results of a SpinDx assay on a fluorescence microscope used for lab based assays. The developers hope to integrate this final step into a portable, point-of-care SpinDx device. (Photo by Randy Wong)

"We've done most of our testing in a benchtop setting, where we spin the sample on the disk and then read it out on a microscope," he says. "The next step is to automate those processes and get the system into users' hands. This technology has a lot of potential for so many applications."

Sandia California News

Smackdown!

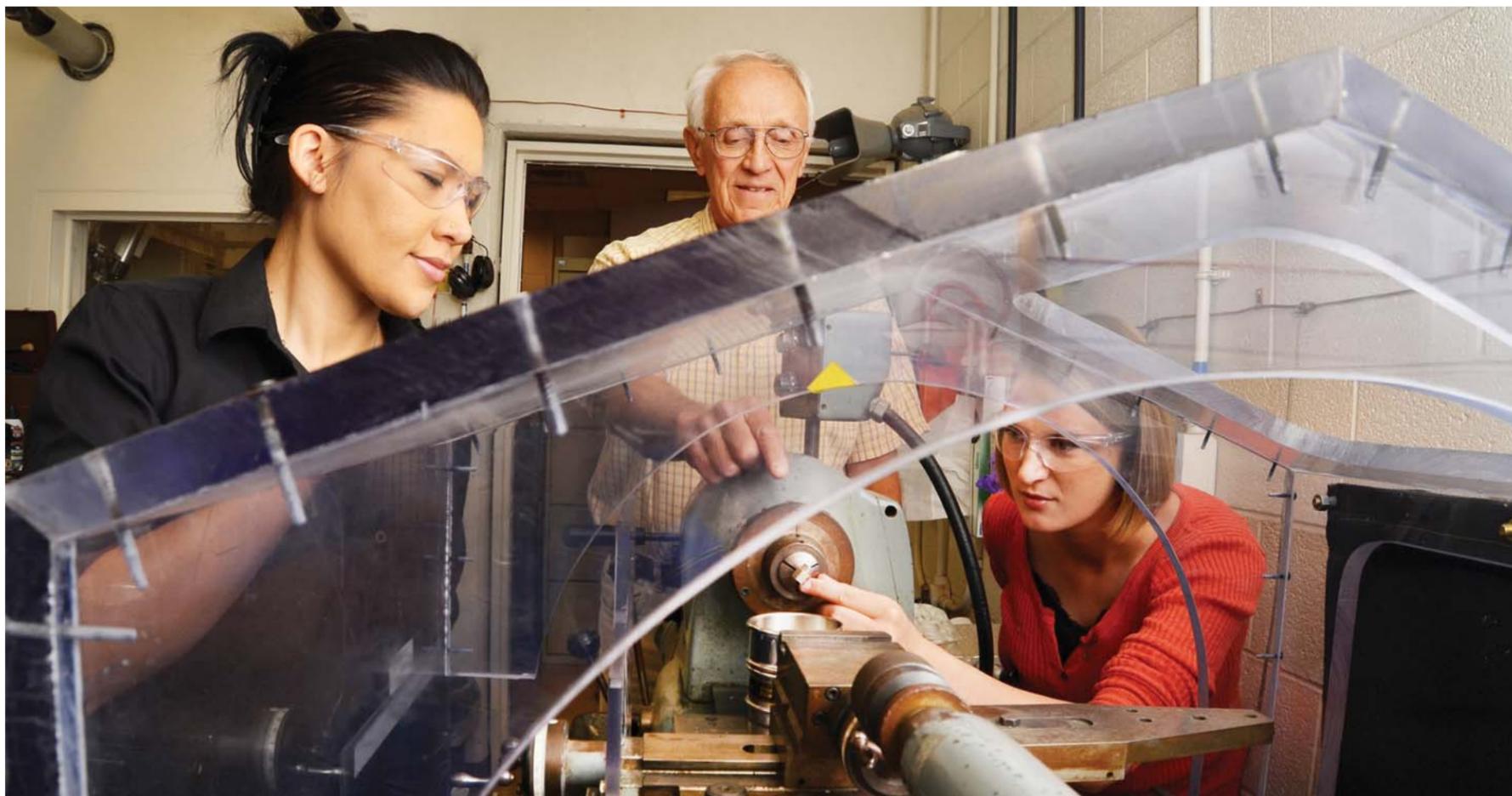
Sandia/California's Active for Life Health and Fitness Labs Challenge features fun, demanding 'Fitness Smack Down'



Photos by Dino Vournas

Sandia/California kicked off the 2012 Active for Life Health and Fitness Labs Challenge with a "Fitness Smack Down." Designed by fitness trainer Emily Thompson and dietician Rachel Connors (both 8527), participants tested their strength and stamina at 12 exercise stations. In the photo above, Dionne Hildago (8511), on right, was the top squatter, completing 60 squats in 60 seconds. Young Ahn (8237), not pictured, also completed 60. Jose Alves (8511), on left, completed 58 squats. In the photo at right, Young Ahn jumped 24 inches, the second-highest jump at the Fitness Smack Down. William Loo (8224) jumped 25 inches and Chris Kershaw (8135) also jumped 24 inches. In photo at left, Belkis Cabrera-Palmer (8132) hula hoops her way to fitness.





MENTORING RELATIONSHIP —Melody Teixeira, left, Tom Massis, and Rachel Carlson (all 2555) look over a disassembly lathe they use in their work. Tom is a mentor at Sandia, where mentoring is part of the culture and takes various forms. (Photo by Randy Montoya)

Mentoring at Sandia: It takes many forms

(Continued from page 1)

Executive VP and Deputy Labs Director for Mission Support Kim Sawyer, champion for mentoring at Sandia, sent certificates of appreciation in March to the outstanding mentor nominees.

"I'm delighted that we have such a strong mentoring culture at Sandia," Kim says. "Mentoring is a vital part of professional development, particularly here at Sandia, where we have such a critical national security mission."

Mentoring can take many forms and is available to everyone at Sandia. It doesn't have to be a formal relationship, says mentoring lead Shelby Green (3502). A site on Sandia's internal web, (<https://sharepoint.sandia.gov/sites/focus/SitePages/About%20Mentoring.aspx>), provides resources for mentors, mentees, and those considering participating in a mentoring program. It links to Sandia's Mentoring Guidebook and lists outstanding mentor nominees. As of last October, the website had been visited more than 2,700 times.

Helping people develop

Howard, who has worked at Sandia for 34 years, believes mentoring is essential to help people develop. He views his open-door policy more as conversations than mentoring.

"At the same time, it's important that people understand where they fit in the Labs, what their job is, how it's perceived," he says. "I find that particularly early-career people focus on a specific project as the scope of their job. I try to put it at a higher level — what is it Sandia does that is important to the nation? It's not specifically a deliverable or widget. I try to help them understand the bigger picture, why we're here, what the values are."

Melody Teixeira (2555) wanted a mentor both to understand how Sandia works and to gain new technical skills because she didn't have much experience before joining the Labs in Albuquerque a decade ago.

Her mentoring relationship with Tom Massis (2555), another outstanding mentor nominee, fell into place at the closely knit Energetic Materials Characterization group because they work together nearly every day, she says.

"If I have a question, he's right here. He responds quickly and well," says Melody, who has been in the group about a year and a half.

Tom says mentoring is natural in a group that works with explosives and always works in pairs or teams. "Obviously, if there are new people around who aren't familiar with it, you're going to be mentoring them," says Tom, who has been either mentee or mentor during his entire 50-year career at Sandia. He estimates he's formally mentored about 10 people.

Mentoring takes time, Tom says. "You keep working

and working and you see that satisfaction. A lot of them could succeed on their own. They don't need me, but we work together on a lot of things."

Tom, who was 20 when he came to the Labs, says he had a great mentor, Robert Buxton, who told him they were in the type of job where it paid to be observant before taking action.

Melody was interested in how things are done at Sandia and asked Tom to show her, but they don't use the words "mentor" and "mentee."

"He says he's going to do what he calls 'train you up right,'" Melody says.

If she's apprehensive about something she's never tackled before, he encourages her, telling her he knows she can do it and he'll help, she says.

"Having guys like Tom around right there to stand beside you while you do something you've never done before ... gives you confidence," Melody says. "Plus he's a really fun guy. It's good for my morale as well to have a colleague who's in the thick of it with me, providing me guidance and support."

Tom also mentors Rachel Carlson (2555). That mentorship first developed when she came to Sandia as a student about a dozen years ago and continued when she moved from student to staffer about 2004.

Invaluable knowledge passed down

His broad knowledge is invaluable, Rachel says. "Anyone could ask him anything, and he could say what happened in 1978 or what happened when there was an issue with a component."

Tom says Sandia realizes tremendous benefits from mentoring and the resulting partnerships because "we come up with answers, or develop something or new materials, or find a problem" and solve it, he says.

Melody and Rachel believe mentoring also benefits the Labs by passing along the knowledge of long-time Sandians.

"They have all this historical information: 'Oh, yeah, I remember when we had that problem and this is how we solved it.' It maintains that legacy of experience and historical information," Melody says. That, she says, allows others to hear about firsthand experiences and "all those intricacies you lose in paper documents."

Rachel suggests more-senior Sandians benefit as well because "they get to work with a different skill set and a different way of looking at things. It ends up being more of a teaming environment."

Vanessa Garcia (5403) had three mentors as an intern at the Center for Integrated Nanotechnology (CINT) for two years. Her contact with Joyce Lujan (10618), Annie Garcia (10694), and Heather Brown (10611) developed into mentorships that helped her move from clerical student to business student to tech-

nical student. Vanessa, who will receive her master's in business administration from UNM this spring, now has mentor Heather Kraemer (2136) as she continues her graduate internship in a new role with Center 5400's mission assurance team.

When Vanessa started at CINT, she was happy just having a job and a paycheck. "I always knew I would go to college but never fully understood the value of a higher education until I started working with these three women," she says. But she looked up to Joyce, Annie, and Heather, and says they helped her develop skills and morphed into mentors who now are also outstanding mentor nominees.

Annie taught her about Sandia's financial areas, Heather Brown taught her program administration, and Joyce gave her advice on what classes to take and whether her program was a good fit for Sandia, Vanessa says.

"It was amazing because I got the full circle of everything," she says.

As the relationship grew, they gave her more responsibility. "They trusted me and they knew I could do it, and because of that my quality of work went up," she says.

When Vanessa became discouraged about school, they'd tell her she needed to finish.

"I didn't have the confidence in myself to feel I could do well in the program," she says. "They encouraged me. I have a 4.0, so obviously their influence has stuck with me."

Being a mentor

Now she'd like to be a mentor someday. "It was such a valuable experience which had a positive effect on my life, I'd like to give that opportunity to somebody else," she says.

Howard recommends people seeking mentors find someone with whom they can think out loud, and says mentors should not presume to have answers. The value, he says, is largely in the conversation itself.

Melody says a good fit is key: "Before you decide to mentor someone else or be a mentee, research a little, think about what kind of individual do you think would be a good match for you."

HR manager Joan Luciano (3502) says Sandians should approach mentoring in the same thoughtful manner as they would any initiative or new assignment. "Too often, people avoid mentoring because they are uncomfortable approaching someone or unclear as to how to take that first step. Or the relationship just fizzles out. Our mentoring resources, especially the Mentoring Guidebook, outline the stages of mentoring and help both the mentee and mentor prepare and think through the various aspects of the partnership. Preparation is key to ensuring a positive experience and clarifying what you hope to gain," she says.

Sandia nominated for Freedom Award



(Continued from page 1)

Secretary of Defense Employer Support Freedom Award, as did Christopher Wade (5561), a sergeant in the Marine Corps Reserve who's currently deployed.

Sandia is now a semifinalist for the award, the highest recognition the Department of Defense offers businesses and public sector employers for supporting employees who serve in the National Guard and Reserve. The Labs will represent New Mexico in the large business category, defined as companies with more than 500 people.

The Freedom Award was created in 1996 to recognize employers who give exceptional support to their National Guard and Reserve members. Nominations must come from employees who are in the Guard or Reserve, or from their families.

The Labs and 22 other employers from around New Mexico were recognized with Above and Beyond awards at a "Salute to New Mexico's Most Supportive Employers" luncheon April 19. Three of those employers — Sandia in the large employer category, Don Gorman Electric LLC of Santa Fe as a small business, and the New Mexico State Police in the public sector — were named Freedom Award semifinalists. As such, they received Pro Patria awards, the state's top honor for support of employees in the Guard and Reserve. Sandia also won a Pro Patria award in 2000.

Gov. Susana Martinez, on hand to give out this year's awards, told the crowd of about 300 that having an understanding employer means everything to people serving on the front lines. She praised the support employers give to the families, from mowing a lawn to showing a spouse back home "which end of the wrench to use."

Michael Hazen, VP of Infrastructure Operations Div. 4000 and the VP champion for the Military Support Committee, accepted Sandia's awards on the Labs' behalf.

Competing against other states, territories

All states and US territories are eligible to nominate companies for the Freedom Award, which goes to the nation's 15 most supportive employers, five in each category. A selection board at the Pentagon will narrow down the nationwide list of 133 semifinalists, then a panel of senior defense officials and business leaders will choose the top five in each category. The Freedom Award winners will be announced this summer. Representatives of those companies will be invited to a ceremony in Washington, D.C., in September.

The New Mexico Employer Support of the Guard and Reserve Committee (ESGR) screened the state's



SANDIA AWARD — Michael Hazen, VP of Infrastructure Operations Div. 4000 (far right), accepted awards on Sandia's behalf from Gov. Susana Martinez (next to Michael) during a luncheon April 19 honoring employers' who support their National Guard and Reserve members. Joining Michael in accepting the Pro Patria award, the state's highest honor for supporting Guard and Reserve employees, are, left to right, Machelle Karler (3512), Rose Gehrke (10617), Jody Thomas (2733), Gilbert Morales (10685), Esther Hernandez (40), and Raymond Battaglini, state chairman of the New Mexico Employer Support for the Guard and Reserve.

(Photo by Randy Montoya)

nominations and selected the top employer in each category.

Sandia's nomination for the Freedom Award says the Labs, where more than 300 members of the Guard and Reserve work, is a model for other large employers. It notes Sandia allows deployed employees to use their own leave and that donated by fellow employees to keep pay and benefits for up to a year. It also cites the Labs' Military Support Committee, which keeps in contact with families to reassure deployed Sandians that their family, their job, and their future are taken care of.

According to highlights of Sandia's nomination, the Labs provided more than 500 hours of paid leave for military duty, and trained its managers about the Uniformed Services Employment and Reemployment Act, which ensures serving in the Guard and Reserve doesn't hurt people in their civilian careers. The nomination also singles out the Military Support Committee for recognizing Sandians' active duty accomplishments once they return.

Andersons praise Sandia's support

Andy was an Air Force reservist when he joined Sandia in February 2003. He says Sandia's willingness to hire him knowing he could be called up was a huge plus "because it's not always viewed as a positive thing because you may be absent from work."

When he was notified last summer that he had two weeks to get ready to deploy to Afghanistan, his manager Dan Briand and project leader Martin Sandoval (both 6811) gave him their full support despite suddenly having to find someone to handle his work.

"Not one time did I get any kind of attitude or frustration or any negative opinion at all," Andy recalls. From

managers to fellow staff members, everyone jumped in to handle his many projects on top of their own heavy workloads. Managers told him to focus on what he had to do in Afghanistan and not worry about his Sandia job.

When he returned April 9, "I had streamers all over my room and balloons all blown up, a big sign on the door, "Welcome back,"" he says.

Andy praises such Sandia policies as allowing those deployed to take advantage of donated vacation time to retain pay and benefits. Sweeping his hand around his office, he adds, "I had a job to come back to; that's always a good thing to know."

Sandia also accommodates his regular reservist duties. He says he occasionally has to take a day off for a conference or is called up during natural disasters in his role as the Air Force's emergency preparedness liaison officer to the state.

"From a regular reservist's standpoint and for deployments, you could hardly work for a better group than I've got," he says.

Ellen, a senior management assistant who has been at Sandia for seven years, praised her boss, Center 1500 Director Duane Dimos, for his help while Andy was gone. Not only was she stressed because of where Andy was, but there also were days when everything went wrong.

"The washing machine broke, the car broke, I had to get new tires, the electricity went out one day" although the neighbors still had power, Ellen says. A coworker of Andy's fixed the electrical problem, but she says Duane was ready to tackle it if someone else hadn't already been on the way.

She told Duane she needed to keep busy while Andy was gone, so he gave her extra projects. Duane, Andy's bosses, and coworkers in both groups called to check on her. Sometimes Duane and his wife would give her flowers, and he'd tell her it was because "you looked so sad last week."

Andy had deployed before — including for Operation Desert Storm in 1991 — but his Afghanistan tour was harder on Ellen because of how quickly news from the fighting there hit the airwaves. She'd hear about something happening where Andy was before he could email her that he was safe. Those were teary times, she says, but her coworkers were there for her.

Now she's been asked to join Sandia's Military Support Committee, and says she wants to offer others the kindness she received. "What I'd like to do is to help the families, just check on them," Ellen says.



NOMINATED SANDIA — Air Force Reserve Col. Andy Anderson (6811) and his wife, Ellen (1500), nominated Sandia for the Secretary of Defense Employer Support Freedom Award, the highest recognition DoD gives businesses and public sector employers for supporting employees serving in the National Guard and Reserve.

(Photo by Randy Montoya)

Pedal to the metal

Sandian helps UNM students reach the finish line



SANDIA ENGINEER Imane Khalil and project manager Garrett Kuehner work together on the University of New Mexico's 2012 Formula SAE race car. Imane teaches engine theory to the student team led by Kuehner. This year's car is a few weeks away from completion. It will compete in June against cars built by undergraduate student teams from across the country.

By Nancy Salem

Every year, mechanical engineering students at the University of New Mexico build a serious race car. And every year, Sandia's Imane Khalil guides them to the heart of the job — the engine.

"It's a blast. We love working with her," says Garrett Kuehner, project manager of this year's UNM Formula SAE (FSAE) race car team. "Everyone recommends her course."

Imane, manager of Structural and Thermal Analysis Dept. 6233, is an adjunct professor in the UNM mechanical engineering department. Her class, High Performance Engine, is one of several that comprise the optional FSAE capstone design course for seniors. Students who opt for FSAE work as a team to build, from the ground up, a race car that competes against entries from universities worldwide.

"My class covers the theory of the engine and how to improve the engine's performance," Imane says. "It brings together everything they have learned in four years."

FSAE, started in 1979, is a student design competition for university undergraduates organized by SAE International, formerly the Society of Automotive Engineers. Its concept is that a fictional manufacturing company has contracted a design team to develop a

skid pad, autocross, endurance, and fuel economy.

FSAE encompasses all aspects of the engineering industry including research, design, manufacturing, management, development, testing, marketing, and finances.

UNM has entered cars in North American FSAE competitions since 1997. In 1998, the program came under the wing of Professor John Russell, a retired Air Force colonel, who made the project an accredited course.

Its cars generally finish in the top 25 percent of all US and world divisions, despite having an operating budget in the lower 50 percent of teams. The UNM team has finished as high as 14th in the world and 10th in the US, and last year was eighth in design and ninth in autocross, its best showing ever in those events.

This year's competition will be in Lincoln, Neb., June 20-23. "We're getting better and better each year," Kuehner says. "It's an evolutionary design process. Each team builds on the previous year."

Hands-on engineering

The program is set up for about 25 students who work on the race car over three semesters, or 18 months. Design begins in the spring and runs through summer. Manufacturing starts in the fall and wraps up the following spring, allowing for some overlap as the incoming team begins design work for its car. The team then prepares for the summer competition.

The team divides into groups that work on different parts of the car: chassis, suspension and steering, brakes, engine, drivetrain, and aerodynamics. Each group uses complex software during the design phase, and their input goes into creating a detailed CAD model of the car.

"This is the flagship project in the mechanical engineering program where students get hands-on design and manufacturing experience in a professional engineering setting," Kuehner says. "The program is run similarly to a small business, mimicking the type of work

found in industry. Considering team members are also balancing other courses, work, and personal lives, there are many sleepless nights spent working on the project."

The estimated annual budget for the program is \$55,000. About \$18,000 goes to raw materials, as 95 percent of the vehicle is made at UNM. Sandia is a key sponsor, donating \$10,000 a year through Community



The 2011 UNM FSAE race car displays the Sandia logo. Sandia is a major sponsor of the program, donating \$10,000 a year through Community Involvement.

Involvement. "Sandia is doing a lot to help this program excel in terms of money and intellectual resources," Imane says. "We really want to help the science and engineering at UNM."

Imane's one-semester class covers engine theory, including thermodynamics, heat transfer, and fluids, and works with Ricardo software — used by Ford, GM, and other auto manufacturers — to model the high-performance engine: 500 cc, dual overhead cam, 5 valve per cylinder. It runs on 85 percent ethanol.

"We buy an engine and by using computer modeling and simulations, we come up with improvements that optimize the engine for speed," says Imane, who has been teaching the class six years ago.

Program director Russell says Imane's contribution has been invaluable. "Much of the reason for our continued success can be attributed to Dr. Khalil's dedicated support," he says.



WHILE ITS OWN CAR was being built, this year's UNM FSAE team got together for a photo with last year's car. The students work on the race car over three semesters, or 18 months.

Giving back

Imane says she is proud of the students, most of whom continue on to graduate school. Some have been hired by auto heavyweights like Ford, Chrysler, Toyota, and Honda.

"I love teaching and academia," Imane says. "It's my way of giving back to the community. I want to help UNM and help students excel at what they're doing."

Imane was born and raised in Lebanon during that country's violent civil war. She moved to the US in 1989 and studied mechanical engineering at the University of California at San Diego, where she earned bachelor's and master's degrees and a doctorate in fluid and gas dynamics. She was hired at Sandia eight years ago.

Imane worked four years in California building airplane engines, a job that qualified her to teach in the FSAE program at UNM.

"It's fun to work with the students," she says. "I love science so teaching this class is not work to me. I leave the classroom feeling grateful to have this opportunity. It is very fulfilling."

Imane says she feels strongly about mentoring young people because she had a mentor in her life.

"My graduate advisor, professor David Miller, gave me invaluable guidance and support which I attribute to the successes I've had," Imane says. "In addition to teaching, I have had many opportunities for mentoring. The students are very receptive to the help a practicing engineer can provide. I have seen some of my students, with a little push, go much farther in their careers than they expected."



UNM's 2011 car competed in driving tests at FSAE nationals last summer in Michigan, finishing eighth in design and ninth in autocross, the school's best showing ever in those events.

small Formula-style race car to be evaluated for its potential as a production item. The target customer is the non-professional weekend autocross racer.

Each student team designs, builds, and tests a prototype based on a set of rules. The car then competes in one or more of seven international competitions in static and dynamic tests. Static tests are design, cost, and business presentation. Dynamic tests are acceleration,

Last Sandia shipment

In DOE's Legacy Waste Removal Program

Photos by Randy Montoya



As DOE's high-priority Legacy Transuranic Waste Program nears its end at Sandia, workers at the Labs carefully prepare the last load of Remote-Handled Transuranic Waste (RH-TRU) to be shipped from Sandia to the Waste Isolation Pilot Plant facility in Carlsbad, N.M. The waste was scheduled to be transported from the Labs this week in specially designed safe, secure containers. To mark the successful completion of the DOE program at Sandia, media were invited to attend an event at the National Museum of Nuclear Science and History where invited speakers included N.M. Gov. Susana Martinez, Albuquerque Mayor Richard Berry, and Tracy Mustin, DOE's principal deputy assistant secretary for Environmental Management, Geoff Beausoleil, manager of NNSA's Sandia Site Office, and Joe Franco, manager of DOE's Carlsbad Field Office.

The legacy waste is the byproduct of nuclear defense program research and weapons production. Much of the waste removed from Sandia came from programs completed in the 1980s.

Depending on the level of radioactivity, the waste was packaged for disposition in lower-level contact-handled waste containers (CH-TRU) or higher-level remote-handled waste containers (RH-TRU).

Both the RH-TRU and CH-TRU disposed of at WIPP consist of tools, rags, protective clothing, and other materials contaminated with radioactive elements that have atomic numbers greater than uranium (transuranic).

Prior to the removal of the RH-TRU waste, all of Sandia's lower-level CH-TRU waste was removed from Sandia, with the last shipment leaving the Labs in October 2011.



Innovation event spotlights science/business teamwork

By Nancy Salem

A kick in the teeth got Delano Romero thinking about mouth guards.

Albuquerque martial artist Romero was sparring in Brazilian Jiu-Jitsu when his mouth took a hit and his teeth fractured. His over-the-counter mouth guard didn't do its job.

"I love being able to recognize some of the success stories at our annual Innovation Celebration."

— Jackie Kerby Moore

Albuquerque Delicate Dentistry was one of 340 small businesses in 27 counties that participated in 2011 in NMSBA, a public-private partnership among Sandia, Los Alamos National Laboratory, and the state of New Mexico that connects small business owners with scientists and engineers who give their companies technical assistance. The program provided \$4.6 million worth of help last year.

Ten projects that achieved outstanding innovations through the program in 2011 were honored May 1 at NMSBA's annual Innovation Celebration at the Encanto Resort in Tesuque.

"NMSBA has been bringing small businesses together with scientists and engineers from Sandia and Los Alamos national laboratories for more than a decade. These collaborations have not only resulted in successful innovations, but they have also resulted in jobs and economic growth," says Jackie Kerby Moore, manager of Technology and Economic Development Dept. 1933. "I love being able to recognize some of the success stories at our annual Innovation Celebration."

Albuquerque Delicate Dentistry was among the projects recognized. Many athletes don't wear mouth guards because they are bulky, uncomfortable and make it hard to breathe. Romero and his wife, Albuquerque dentist Vesna Delic, researched how custom mouth guards could be improved and more widely used, but found little information or industry standards. They applied to NMSBA and were teamed with James McElhanon (1821), an organic chemist at Sandia.

They had two questions: What is the best material

Romero started a business, Albuquerque Delicate Dentistry, to develop a better mouth guard and worked through the New Mexico Small Business Assistance (NMSBA) Program to perfect it.

Albuquerque Delicate Dentistry was one of 340 small businesses in 27 counties that participated in 2011 in NMSBA, a public-private



WITH SANDIA HELP, martial artist Delano Romero and his wife, dentist Vesna Delic, developed a mouth guard that can absorb the toughest punches.

for shock absorption? How thick should a mouth guard ideally be?

James tested and analyzed a variety of materials and helped Romero identify the best one for a mouth guard and its ideal thickness. "As a result of working with NMSBA, Albuquerque Delicate Dentistry now makes custom-fit mouth guards that are lightweight, strong,



MOUTH GUARDS by Albuquerque Delicate Dentistry are custom fit and have customized colors and designs.

shock absorptive, and even customizable with color and design," says Romero, who hopes to expand his product line into commercially available over-the-counter mouth guards and other protective gear.

Here are some other projects recognized at the Innovation Celebration:

- Bruce McCormick of SAVSU Technologies worked with Sandia on a solar thermal ice-making product. The Santa Fe company plans to deliver life-saving vaccines worldwide in storage containers that use only solar energy to keep temperatures low.

- Sandia researchers helped Musicode Innovations of Taos create a state-of-the-art design for a musical instrument based on Musical Instrument Digital Interface (MIDI) technology.

- Pueblo of Zia is working to develop and export renewable energy in a project that aligns culture and values with economic goals. LANL helped the pueblo with site assessments, energy transmission and distribution system access, and economic analysis of energy alternatives.

- LANL collaborated with Herbs, Etc. of Santa Fe to develop a scientifically based standard for microbe levels in its herbal products.

Since its inception, NMSBA has provided 1,876 small businesses with \$29.8 million worth of research hours and materials. The program has helped create and retain nearly 2,317 New Mexico jobs at an average salary of about \$38,000, increase small companies' revenues by \$107.6 million, and decrease their operating costs by \$63.6 million. These companies have invested \$34.9 million in other New Mexico goods and services and received \$40.9 million in new funding and financing.

For information about NMSBA, call Genaro Montoya at (505) 284-0625 or visit www.NMSBAprogram.org.

Old robot gets new life at New Mexico Highlands University

By Stephanie Hobby

A former DARPA robot developed at Sandia is now serving an educational purpose at New Mexico Highlands University (NMHU).

About a decade ago, Sandia developed the Multi-function Utility Logistics Equipment Vehicle, or MULE, robot. The project was sponsored by DARPA — the Defense Advanced Research Projects Agency — Lockheed Martin, and Sandia to help troops haul heavy equipment across a variety of terrains, and could negotiate one-meter steps. But once the MULE had served its purpose, it was parked in a garage at Sandia's Robotic Vehicle Range and left alone until the summers.

For the past two summers, students and Gil Gallegos, chair of the computer and mathematical sciences department at Highlands, worked with the MULE as part of DOE's FAST, or faculty/student program, which pairs students with professors for research projects.

Gallegos and NMHU students added hardware and software to expand the MULE's capabilities.

"Every summer, we'd dust this off, and students would get very excited to work on it for the summer," says Jake Deuel (6532), manager of the Robotic and Security Systems group. "We realized we weren't doing anything with it, and found a way to donate it to NMHU for two years."

Gallegos says the goal of having the MULE at the university's lab is to help generate thesis topics for graduate students in the computer science department and for undergraduate senior capstone projects. He adds that it will be a valuable recruit-

ing tool to encourage students to pursue STEM careers.

"We're very appreciative of Sandia allowing us to use this. It really does improve our program, and it's very exciting to have the robot in the lab and to have students excited about it," Gallegos says.

Miguel Maestas earned his bachelor's degree in computational engineering from NMHU two years ago and is now in his second semester as a master's student. He says the MULE will be instrumental to his thesis work, and is anxious to start working with it. He will first run diagnostics to ensure all electronic parts are intact, and has plans to integrate a 3-D image capture function. Eventually, this would help with object and possibly facial recognition to enhance the robot's navigational



SANDIA PROGRAM MANAGER Jake Deuel (6532) joins Logan Herrera, a senior undergraduate computer science major at NMHU, Sandia senior staff scientist Wendy Amai (6532), NMHU computer science graduate student Miguel Maestas, and chair of NMHU's computer and mathematical sciences department Gil Gallegos. (Photo by Rick Loffredo/NMHU)

capabilities.

Currently, four undergraduate and three graduate students are signed up to work with the MULE, but Gallegos expects that having the robot on campus will continue to generate interest. Other projects in the works include software development to communicate with motors that control the MULE's six wheels and shoulders and installing micro-controllers for individual joints, shoulders, and wheels.

"I'm hopeful that this will help recruit other students into the computer sciences

department. It's very exciting to be able to work with the MULE and to know that it has been used to help develop other projects that are state-of-the-art," Maestas says.

Security at Sandia

Moving security beyond a cost of doing business

By **Brian Bielecki**, Director, Security & Emergency Management

As a national security laboratory, Sandia has a reputation for attracting the best staff to solve some of the nation's most difficult technical challenges. Customers seek our services in many areas not only because of our world-class employees and capabilities, but also because they expect their products and information to be secure with us. Unfortunately, the cost of security today has been shaped by requirements established decades ago that reflect limited understanding of lifecycle costs and mis-

sion impacts. As a result, security is at times perceived as "just the cost of doing business" and a "check-the-box" inflexible program not aligned to today's technologies, threats, and diverse missions. All of this led to unnecessary costs and a frustrated workforce. These unacceptable conditions are contrary to the needs of our mission customers.

Instead of being a cost of doing business, security must serve as a "positive differentiator" to mission success by establishing threat-relevant, customer-valued security solutions that not only facilitate mission execution, but also attract new

mission opportunities. This is the objective for guiding changes in Sandia's security program. Many changes have already been made and others are planned over the next several months, including new policies on the use of portable electronic devices and handling of classified information.

Sandia's ability to execute missions securely remains a foundational expectation of our customers. To maintain their trust and confidence, we need to provide threat-relevant security solutions that facilitate mission execution. As a result, current and future changes are focused in the key areas described below.

❖ Threat Relevance

A threat-relevant protection strategy aligns efforts to mitigate threats and associated consequences with the potential severity. For example, threats from inadvertent disclosure of sensitive information are

more significant than threats created by bringing a cell phone into a Limited Area. Future changes in security are aimed at significantly reducing efforts to address low-risk conditions, while increasing emphasis on high-risk conditions that present greater threats to Sandia's missions. Resulting policy, process, and procedure changes related to controlled articles, information storage, reporting, etc., will be communicated and implemented in the second half of FY12.

❖ Streamlined requirements

Security customer value is created with affordable solutions that provide the needed level of security at the most reasonable costs. The Sandia security team is working with other NNSA federal and contractor security teams to rewrite security requirements using national standards, where possible, to replace outdated and cumbersome requirements. The reform focuses on eliminating unneeded requirements while providing the flexibility to apply requirements in a risk-based manner. The first two sets of revised requirements are already in use. Examples include reducing intrusion detection systems and alarms, redefining accountable material inventory standards, and changing Closed Area access logging.

❖ Using technology to establish error-tolerant systems

Error-tolerant systems recognize that we are all susceptible to inadvertent errors. Since some errors can compromise sensitive information, Security is making an effort to integrate technology as a prevention tool. These tools help reduce error-likely situations, as well as the consequences of errors that do occur. Current activities target storage and processing of sensitive information (email tools) and the introduction of portable electronic devices in high-security areas (detectors). The expected benefit is better protection and fewer incidents, which consume time and energy to assess and correct.

❖ Performance- and risk-based assurance system

An effective assurance system is essential to understand, improve, and sustain overall performance. Assurance system changes will provide a better view of Sandia's overall security performance and allow us to better identify and address emerging patterns. The objective is to shift security assurance activities from a rules-based approach to one focused on performance in the context of specific mission work and associated risks. Security metrics have also been refined to focus on incident severity, near misses, and key behaviors.

❖ Effective communications and knowledge sharing

Establishing and sustaining high levels of performance requires providing relevant information, delivering training that enhances awareness, skills, and knowledge, and routinely seeking and using feedback to improve. Several actions are underway, many resulting from last summer's Security Learning and Feedback Activity, SEC2011. Examples include providing more real-time access to security data, issues, and best practices; establishing a means to routinely gather and respond to feedback on improvement opportunities; integrating security professionals into mission organizations; and revising all security training, beginning with the New Hire Orientation, to integrate threat-relevant information and create interactive, concept-based sessions.

❖ Partner on Mission Work

Involving security professionals early in new and modified mission work helps to quickly identify and mitigate security-related risks. Actions focus on providing tools to better assess security risks and increase the use of security professionals on mission project teams to develop mission-focused, cost-effective security solutions.



"Instead being a cost of doing business, security must serve as a "positive differentiator" to mission success by establishing threat relevant, customer-valued security solutions that not only facilitate mission execution, but also attract new mission opportunities. This is the objective for guiding changes in Sandia's security program."

— **Brian Bielecki**

DOE diversity, economic impact Director Dot Harris visits Sandia



DISTINGUISHED VISITOR — Dot Harris, right, director of DOE's Office of Economic Impact and Diversity, visited Sandia this week to be briefed on the Labs' small business utilization practices and economic impact in the community. Harris was hosted by Div. 10000 VP and Chief Financial Officer Jeffrey Kallio, who provided a Sandia overview. Supplier Relations and Small Business Utilization Dept. 10222 Manager Don Devoti also briefed Harris, after which she visited the Integrated Technologies and Systems exhibit in Bldg. 810 and had a tour and overview of the Microsystems and Engineering Applications (MESA) facility. Harris wrapped up her visit to Sandia with lunch at the Innovation Parkway Office Complex (IPOC), where she was joined by a delegation of small business suppliers. In the photo above, Rhonda Dukes (10242), strategic contracting representative with Sandia's Procurement Department, looks over a model of the MESA complex with Harris, explaining how the Labs' small business utilization and procurement processes played a key role in the successful development of the unique facilities. (Photo by Randy Montoya)

YWCA award celebrates Sandian's work with young people

On the move

By Nancy Salem

Tameka Huff was drawn to the National Society of Black Engineers (NSBE) while a student at Bennett College in Greensboro, N.C. The group's mission to increase the number of culturally responsible black engineers who excel academically, succeed professionally, and positively impact the community resonated with the young computer science student.



TAMEKA HUFF has encouraged dozens of middle and high school students to attend college.

"I was encouraged by one of my classmates to join NSBE and have been involved ever since," Tameka (6925) says. "I attended my first NSBE conference where there were opportunities to network with other college students, workshops, and a large career fair. It was a great place to find an internship or full-time employment."

Tameka joined NSBE in 2000 as a college junior and deepened her involvement when she took a job at Sandia in 2001. She worked as a mentor in NSBE's middle- and high-school chapter in Albuquerque and for the past five years has been the program advisor, finding ways to encourage young African Americans to go to college and, for some, become engineers.

Fighting racial and social injustice

Tameka's dedication to fighting racial and social injustice and empowering women has earned her one of Albuquerque's most prestigious awards. She was among the YWCA's 2012 Women on the Move, an award created in 1985 to celebrate extraordinary women who make significant contributions to their community and distinguish themselves in their chosen fields and through leadership.

Sandia's Elizabeth Gonzales (10222), a YWCA Middle Rio Grande board member, says there were 13 honorees among 36 nominees for this year's Women on the Move awards. "It was an exceptionally strong group of nominees," she says. "Tameka's award is very significant."

Tameka is a usability engineer in computer science, a field that combines design, computers, and psychology. "My job is to make sure we design software with the user in mind," she says.

She works with departments throughout the Labs on software design and testing, getting the user involved up front so the software is easy to use. "I started out doing software development and developing graphical user interfaces, and wanted to learn more. I wanted to be sure people could use what I developed," she says. "Now there's more demand for usability work so I don't do development anymore."

Tameka has a master's degree in human computer interaction from Carnegie Mellon University in Pittsburgh, earned in 2003 through Sandia's master's program, then called One Year on Campus. A native of Rochester, N.Y., she has a bachelor's in computer science from Bennett, a historically black women's college.

Her goal as advisor for the NSBE middle- and high-school chapter in Albuquerque is to get students to pursue STEM (science, technology, engineering, and math) careers and go to college. She coordinates programs

including tutoring, leadership, college and ACT prep, and robotics and math competitions. Her students won the regional competitions this year and finished second at nationals.

Travel a key motivator

Tameka says a key motivator for the students — there are 15 this year — is travel offered through NSBE. "They go to the convention and go on college tours and attend college and career fairs," she says. "The trips make a difference. They see African American engineering professionals and college students. They attend academic workshops. They start to get focused. The exposure really makes them come back motivated."

"Parents, teachers, church members, and many others guided me. I owe a lot to the people who saw something in me."

— Tameka Huff

Every senior in the Albuquerque program since Tameka has been advisor has gone on to college, and half of those in engineering. "It is so rewarding," she says. "It's a lot of work, but the rewards are greater."

Tameka says helping students is her way of giving back to a community that supported her. "Parents, teachers, church members, and many others guided me," she says. "I owe a lot to the people who saw something in me."

Sharon Lawson (42491), one of several who nominated Tameka, says she is an extraordinary role model for young people. "She has taken her knowledge and shared it with them," Sharon says. "She meets with the group every week and prepares them for competitions and projects, and encourages them to consider careers in engineering. She relates to the students and their parents. She is dedicated and devoted."

Lockheed Martin/Sandia donates \$20,000 to Albuquerque Heading Home program

The Vision: Albuquerque is a city where homelessness is rare, short-lived, and non-recurring

By Amy Tapia

During the Spring Manager's Forum, Sandia President and Labs Director Paul Hommert and Executive VP and Deputy Director for Mission Support Kim Sawyer presented a check for \$20,000 from Lockheed Martin, on behalf of Sandia, to Mayor Richard Berry and the Albuquerque Heading Home program. Berry attended the Spring Manager's Forum to thank Sandia's employees for their generous support of the community.

Albuquerque Heading Home was launched in early 2011 as a collaborative effort between the city of Albuquerque and local not-for-profit organizations to mobilize services and resources toward a common goal: to house and support Albuquerque's most vulnerable people living on the streets. In its first year, more than 90 chronically homeless people were housed.

The system of care for homeless people in Albuquerque had operated on a "first-come, first-served" basis. The most likely to receive

services and housing were those most able to walk through service provider doors. That left those least able to navigate gateways and pathways to experience chronic homelessness. In addition, services were fragmented. Using a "community response" approach, the New Mexico Coalition to End Homelessness con-

vened a small workgroup of representatives from homeless services, affordable housing, law enforcement, policy, and city government. The aim was to develop a plan to align multiple providers to achieve specific, measurable goals to address what has been perceived as an intractable problem.

More than 200 volunteers surveyed homeless people using a vulnerability assessment that determines highest risk of mortality on the streets. Currently, Albuquerque Heading Home is systematically placing those most vulnerable in housing, providing supportive services with case managers from across the service system, and seeking ways to eliminate systems barriers to expedite access to housing.

According to Berry, this plan is the "smart way to do the right thing" because it costs society more for someone to live on the street than it does to house them. The goal, he said, is for the community to be a place where homelessness is "rare, short-lived, and non-recurring."



Sandia starts building 12th Habitat for Humanity house



Sandia's Habitat for Humanity volunteer team joins with Blaise, Gisele, Fredance, and Jerome during the dedication ceremony. The family is required to help build their home and is looking forward to moving in at the end of the summer. (Photo by Community Involvement)

By Stephanie Hobby

Every year for more than a decade, Sandia employees, contractors, retirees, and family members turn out to hammer, saw, sand, and paint their way into a new home for a deserving family. This year, Sandians are partnering with a family that was relocated to the US after fleeing war and living in refugee camps in Rwanda and Tanzania.

The couple — Jerome Ndabirorere and Fredance Nibakiza — were originally from Burundi, but were forced out by war while they were still children. The two met in a Rwandan refugee camp and had two children — Gisele and Jean Claude. Their home at the time was made of plastic sheeting, which provided little protection from the relentless sun and monsoon rains. Their third child, son Blaise, was born after the

family moved to another refugee camp in Tanzania.

"Life was very, very difficult back then," Jerome says.

The family moved to the US five years ago, and has been living in an apartment since then. Jerome and Fredance have worked in a hotel for the entire time, and their efforts have been focused on making sure their children have hope for a better future. Gisele is now in college, studying to be a nurse and pursuing her goal of helping people. Jean Claude is in high school, and is a soccer star with dreams of pursuing a professional soccer career in Europe. Blaise, who is in middle school, likes working with computers and playing soccer for AYSO.

"My children are extremely happy because they're going to live in a beautiful home, and we are very thankful to God and everyone who is helping with

our home," Jerome says. One of the requirements of Habitat for Humanity is that the family completes 500 hours of "sweat equity," so Jerome, Fredance, and their children spend nearly every free moment working alongside Habitat volunteers.

Sandia's efforts started on Friday, April 20, at the build site at 6419 Trujillo Rd. SW and are expected to continue through the end of July with breaks for Memorial Day and Independence Day. More than 300 volunteers are needed for every phase of construction. Traditionally, every division within Sandia covers a weekend's worth of activities, and is responsible for recruiting volunteers.

The dedication of the home is scheduled for Saturday, July 28.

To volunteer, see the schedule and list of contacts below.



SANDIA EXECUTIVE VICE PRESIDENT Jerry McDowell (0002) joins the Habitat for Humanity effort.

Work Period	Division	Date	Task	Number of Volunteers	Misc. Information
1 st	Eric Miller Div. I	Saturday, April 14	Layout – Plates	5	Prep work for Groundbreaking
		Friday, April 20	Wdn/Dr Frames - Walls	25	
2 nd	Connie Wenk Div. I	Saturday, April 21	Groundbreaking/Wall Raising	25	
	Fran Current	Friday, April 27	Frame – Misc.	20	
3 rd	Division 2000	Saturday, April 28	Set Trusses – Sheathing	20	
	Stan Hall	Friday, May 4	Sub Facial- Misc.	25	
4 th	Division 9000	Saturday, May 5	Deck Roof – R-Underlayment	25	
	John Norwalk	Friday, May 11	Shingles – Misc.	15	
5 th	4000	Saturday, May 12	Shingles & Misc.	15	
	Bruce Nguyen, 10000	Friday, May 18	DOW Board Soffits	15	
	Darick Lewis, 10000	Saturday, May 19	Windows & Miscellaneous	15	
No work		5/25 – 5/26	MEMORIAL WEEKEND	0	NO WORK
6 th	Steve Neff	Friday, June 1	Miscellaneous	15	
	5000	Saturday, June 2	Miscellaneous	15	
7 th	Stan Hall	Friday, June 8	Hang Wall Board	25	
	9000	Saturday, June 9	Hang Wall Board	25	
8 th		Friday, June 15	Cont. Hang Rock	20	
	Student Intern Day/STAR	Saturday, June 16	Finish Hang Rock	20	
9 th	Daniel Roberts	Friday, June 22	Hang Doors – Trim	20	
	Division 3000	Saturday, June 23	Paint Wall & Ceiling	20	
10 th	Mike Hightower	Friday, June 29	Trim-Paint-Underlayment	15	
	6000	Saturday, June 30	Cabinets – Misc.	15	
No Work		7/6 – 7/7	4 th of July	0	NO WORK
11 th	T. J. Mannos	Friday, July 13	Detail & Punch	15	
	1000	Saturday, July 14	Landscaping – Misc.	15	
12 th		Friday, July 20	Detail & Punch	10	
		Saturday, July 21	Detail & Punch	10	
13 th		Friday, July 27	Appliances Final	5	
		Saturday, July 28	Owners Dedication	ALL	

*This Build Schedule is only TENTATIVE because of such factors as weather, waiting for subcontractors and inspections, etc!