NNSA honors Sandian for helping with new data tool roll-out

Story by Sue Major Holmes

Sean Lee Hendrickson says he didn't know he'd even been nominated as Sandia's NNSA Defense Programs Employee of the Quarter until a manager sent him an email congratulating him on winning.

NNSA honored Sean (9517) for helping Sandia migrate data warehouse processing from one type of management tool to another. He led the deployment of the first production implementation of Oracle Data Integrator (ODI) in Sandia's Science and Engineering Information Systems, and produced a map for future migrations from Sandia's current tool, Datastage, to ODI.

"It's challenging work," Sean says. "You have to understand both tools and how they do things in order to be able to do the conversions. You have to understand what the old tool does, and then be able to apply those same business rules in the new tool."

The enterprise data warehouse is a centralized repository of mission-related engineering, scientific, and environmental, safety, and health data that ties together data from independent systems that otherwise would be difficult to correlate. The technology draws data about Sandia's work from many source systems and provides the technology to pull targeted data from those systems and integrate it into a central

(Continued on page 2)

INFORMATION TECHNOLOGY HONOREE Sean Lee Hendrickson is Sandia's NNSA Defense Programs Employee of the Quarter. Sean (9517) led the deployment of the first production implementation of Oracle Data Integrator in Sandia's Science and Engineering Information Systems and produced a map for future migrations from Sandia's current tool. The conversion required setting up new servers, training people, and figuring out how to test and release the new tool. (Photo by Randy Montoya)

Total Health updates

- Toll-free numbers provide immediate care for Sandia Total Health members
- Preventive care under Sandia Total Health covered at 100 percent
- BCBSNM and UHC onsite customer advocates available to all Sandia employees

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Sandia LabNews

Vol. 64, No. 13 July 13, 2012

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Sandia National Laboratories

Turning teacher in retirement offers a 'purposeful and enjoyable way' to help others

By Patti Koning

While Mark and Joanne Perra spent their professional careers in laboratories and offices — he was a materials science program manager and research manager at Sandia and she was a computer scientist at Lawrence Livermore National Laboratory — in retirement, they find themselves back at school. Not as students, but as part of a team of volunteer science educators.

Most Tuesday afternoons you can find them teaching fifth graders about science at the Preparatory Literacy Academy of Cultural Excellence (PLACE) @ Prescott, a West Oakland elementary school in a highly impoverished community. "We never would have envisioned ourselves here," says Mark. "But it's truly wonderful to have found a purposeful and enjoyable way to help others using our gifts."

During their professional careers, the couple financially supported a number of nonprofit organizations and became more directly involved after they retired in 2002. Mark served on the board of directors of the Scientific Technology and Language Institute (STLI),

(Continued on page 3)

AT THE PLACE@PRESCOTT Family Science Night, students were mesmerized by the spinning "tornado" in colored water. Explaining the phenomenon to the West Oakland elementary school students is Sandia retiree Mark Perra. (Photo by Dino Vournas)

ACS on Campus

The American Chemical Society's ACS on Campus is bringing workshops on career development and resources for scientists and engineers to Sandia's postdocs and interns, only the second time the program has come to a national laboratory. See **page 5**.

Climate skeptic speaks

MIT professor Richard Lindzen, a global warming skeptic, told about 70 Sandia researchers in the 2nd floor lecture room of Bldg. 858EL in early June that too much was being made out of climate change by researchers. See story on **page 6.**

Game on!

A group of students in UNM's Interdisciplinary Film and Digital Media program wanted to do something different for their senior capstone project. Film is the norm. They went with a video game. Story on **page 8.**

That's that

When I came across this story, I didn't know quite what to make of it. It seemed counterintuitive: A paper published in the *Proceedings of the National Academy of Sciences* reports that "Too much math is tough for scientists." At least that's how one newspaper headline summarized the study.

Other headlines took the same tone: "Scientists are afraid of math too, says study;" and "Study suggests scientists find it hard to do too much math." But hold on for a second. The actual paper doesn't quite say that. The authors, from the University of Bristol in Britain, titled their study "Heavy use of equations impedes communication among biologists." Based on the paper's actual title, it seems to me the headlines should have said "some" scientists. The Times (UK) deserves kudos for getting it right. Their headline stated, "Maths-heavy papers put biologists off."

But don't blame the media, or only the media, for overstating the case. The University of Bristol news release about the study opened with this:

"Many people remember struggling with maths at school, but few of us would expect that professional scientists suffer from a similar problem in their daily work. A new study by biologists at the University of Bristol shows that scientists tend to overlook their colleagues' research if it is packed full of mathematical equations."

The news release goes on to point out that the paper really only talks about biologists, and not all biologists, at that. It turns out that the math phobia is apparent only in papers that are reporting empirical findings. Theoretical papers, the study found, cite equation-heavy precedents quite freely.

The authors of the Bristol study express concern that the apparent disconnect between the empirical and theoretical sides of biology could be impeding scientific progress. And they offer a possible approach to mitigate the problem. They note that "equations presented in an accompanying appendix do not lessen a paper's impact." (Who reads the appendix, anyway?)

So what to make of all this? It didn't take long to decide that, while the study was measured and modest in its scope, the subsequent media stories, egged on by the first paragraph of that Bristol news release, seemed much ado about nothing. The study doesn't talk about all scientists and not even all biologists, and doesn't purport to. You just can't conclude from the actual paper that scientists fear math, as the headlines would have it.

But to the extent that the study does focus on biologists, it may be unintentionally reinforcing a characterization of that discipline that is decades out of date (if it was ever accurate at all).

When I was in school (this goes back way more years than I care to divulge), biology was the course to take if you just had to get that science credit out of the way to graduate. It wasn't exactly easy, but it wasn't heavy on math, either, which was the point. Math, of course, was the nemesis, the reason I became a writer rather than — what? — an astronaut? It became clear to me somewhere around 11th grade that if I ever got to space it would be as someone like Robert Heinlein's character from *The Green Hills of Earth*, Rhysling, the Blind Singer of the Spaceways (hopefully with my eyesight intact). If biology was a so-called "soft science" decades ago, it has gotten harder and harder over the years: Biochemistry. Biophysics. Bioengineering. I recall former Labs Director Paul Robinson saying in a public meeting about 15 years ago that if physics was the science of the 20th century, then biology is the science of the 21st. And the incredible strides we're seeing in genomics, in proteomics, in dozens of disciplines that fall under the big heading of "biology," seem to affirm that assessment. And trust me, the people making these giant leaps aren't skimming over the math.

* * *

All of this raises questions about the language of mathematics, though. I think it's quite clear that a certain small percentage of the human population speaks "math." These are people who are more comfortable speaking in mathematical terms than in their purported native languages. Math is how they express their deepest thoughts and even their emotions. Emotions? Well, isn't $E=mc^2$ a very passionate statement about the nature of reality? A thrilling exclamation, like "I love you!" I know that's a bit over the top, but just a bit. Some of our most profound insights about the universe exist first as mathematical expressions. Go figure.

See you next time.

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

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Sean Hendrickson named NNSA's latest Employee of the Quarter

(Continued from preceding page)

repository. That makes reporting and analyzing easier because everything's in one place, allowing existing reporting and analysis tools to be used.

Project manager Susan Byrnes (9512) says the massive ongoing effort needs to be done so Sandia can retire the old tool, which the manufacturer is phasing out. The conversion requires setting up new servers, training people, and figuring out how to test and release the new tool, she says.

"He worked out the process — how are we going to make the changes, how are we going to test them, how are we going to release them. He took the initiative to sort out the details … and he documented what we did so we can do it again and build on it."

— Project manager Susan Byrnes

Susan's nomination of Sean says his efforts will enable the Labs to support a cost-effective and modern architecture for future data warehouse improvements. NNSA recognizes award recipients for going beyond the call of duty in supporting the Defense Programs mission.

Sean spearheaded work to get the first set of code into production on Sandia's networks. It was the first in a series of releases for the production networks, Susan says.

Months of planning, coordination

The initial data migration to ODI took place over one day, but required months of planning and coordination between operations, infrastructure, database administration, data warehouse developers, and customers.

"He worked out the process — how are we going to make the changes, how are we going to test them, how are we going to release them. He took the initiative to sort out the details … and he documented what we did so we can do it again and build on it," Susan says.

Sean used a spreadsheet of all the jobs to be converted and how Datastage and ODI list each one. Because the tools are different, it wasn't always a one-to-one conversion, he says.

"We did a lot of testing ahead of time in our development and quality environments to ensure that when we would run the ODI jobs that we were getting the same outputs as what Datastage was doing," he says.

For example, the internal structure and the way the two databases store text fields are different, and the team has to make sure the text reads the same in both tools, Sean says.

The team is releasing code in increments and handling chunks of jobs at a time, Sean says. The conversion is being broken down by job groupings because it's easier to move groupings together.

Mapping data from legacy systems

Sean estimates it will take at least two more years to move existing information into ODI. At the same time, he says, the team is getting new requests for data sources and integrations.

It's already working with one organization to pull information from a legacy system. Team members are seeing how the organization wants to report on legacy data with their new system currently under development. They'll begin using the new ODI technology once it's deployed. That will make it easier to integrate the data once the organization moves to ODI.

"One of our biggest challenges this year is trying to map the data from the legacy systems into the new system," Sean says.

Sean spent 20 years in the Air Force as a computer programmer and database administrator. His last assignment was at Kirtland Air Force Base's Defense Threat Reduction Agency, with which Sandia has a close working relationship. After retiring, Sean was hired as a contractor at Sandia, then hired on as a Labs' staff member in June 2011.

He sees Sandia as his second career.

"I told my boss I have fun here every day," he says.

Family Science Night in Oakland

THE WONDERS OF SCIENCE excite a young mind. (Photo by Dino Vournas)

(Continued from page 1)

which facilitates the training of medical doctors, nurses, community development leaders, and university students in the country of Kyrgyzstan in central Asia.

This effort was an eye-opening experience for the Perras, enabling them to explore exotic cultures that for more than two millenia had been part of the Silk Road network of trade routes. About three years ago, Joanne began searching for a more family friendly, local opportunity for service and came across Faith Network of the East Bay (http://www.faith-network.com/index.html).

A dream realized

She was drawn to Faith Network's Science Horizons, which partners with schools and informal science centers to provide science enrichment programs to low-income, predominantly minority students in grades K-12. "It held the potential for simultaneously engaging our mutual love for science, the outdoors, and children. I did some tutoring in a high poverty area as a college student and had long dreamed of returning to this," explains Joanne.

The couple initially saw themselves working one-on-one with students or in more of a background role, but as they learned more about the vast need for science enrichment, they saw that with their professional and personal experience, they could offer their skills to larger groups of students.

"What we found most compelling was that we could leverage our interests and experience in science and outdoor education to make a significant difference in the lives of children in great need," Mark says. "Even a small contribution of time and attention to the children can help turn the tide in the face of a huge and seemingly intractable problem."

Elementary school science has fallen victim to standardized testing pressure. Because science doesn't appear on standardized tests in California until the fifth grade, many public schools have de-emphasized teaching the subject to allow more time for language arts and math.

On top of that, science can be a challenge for classroom elementary school teachers as most don't have backgrounds in science and carrying out hands-on activities essential to teaching the subject takes precious time. In inner-city Oakland, these problems are compounded.

"As a newly designated 'science focus school,' and one that is working hard at improving the quality and quantity of our science instruction, we greatly appreciate the support of Mark and Joanne and our other volunteer scientists, who bring their deep understanding of and enthusiasm for science to our students," says Lorraine Mann, a science specialist at PLACE.

Projects kids can relate to

Using Full Option Science System (FOSS) materials, a research-based science curriculum developed by the Lawrence Hall of Science and UC Berkeley, the Perras usually spend several sessions of the weekly afterschool science club teaching basic scientific concepts like electricity and magnetism through simple experiments. Last spring, the students made their own loudspeakers using wire, magnets, and a bowl.

"They were astounded that they could make an object that could produce beautiful music and intelligible speech," says Mark. "They could really relate to this project — every kid loves music. We played their favorite musical groups from iTunes, experimented with changing variables on the speakers themselves, and used a "tone generator" to study the relationship between vibrations and sound." In addition to feeling the vibrations and hearing the sound, the students could see and measure the relationships between amplitude and frequency for various musical notes by using a spectrum analyzer app on an iPad.

A NEW WAY of seeing. (Photo by Dino Vournas)

Sandia CaliforniaNews

@ Prescott, we agreed to hold a special demonstration Family Science Night at the school to enable the Science Horizons volunteers to incorporate some of our activities and ideas into their program," explains Sandia/ California community relations officer Stephanie Beasly.

Four local elementary schools were invited to participate. The event, says Mark, was a huge success, drawing a larger turnout of parents and children than any similar school event in memory.

"The FSN volunteers and coordinators came well equipped to foster ties among parents, schools, and children, and to spur a broader and deeper interest in science," he adds. "It is vital to make inner-city schools a welcoming place for family members, to engage families in supporting their children's academic success, and to strengthen connections to local institutions. On all counts, this is what FSN does."

PLACE @ PRESCOTT science specialist Lorraine Mann pauses to catch her breath during Family Science Night. (Photo by Dino Vournas)

The Perras have sought opportunities for connecting Oakland schoolchildren with the vast science resources available in the Bay Area. They've started networking with Lawrence Berkeley and Lawrence Livermore national laboratories, UC-Berkeley Engineering, and Sandia/California.

When Mark and Joanne heard about Sandia's Family Science Night (FSN) program through Joel Lipkin, another Sandia retiree who volunteers his time with FSN, they saw a perfect fit. As Sandia/California's signature community outreach program, FSN brings hands-on science and math activities to more than 6,000 local elementary school students and their families each year. Each activity uses everyday household materials like coffee filters, baking soda, straws, and glue to explore basic scientific concepts like aerodynamics, magnetism, and chemical reactions.

Program reaches more than 50 schools

Sandia/New Mexico began its FSN program in 2001 and now reaches more than 50 schools each year. Sandia/California piloted FSN at two schools in the spring of 2005 and now reaches about 30 schools each year. Because of limited resources, Sandia/California offers FSN only in Livermore and the neighboring cities of Pleasanton, Dublin, Tracy, Discovery Bay, and Brentwood.

"Because of Mark and Joanne's dedication to PLACE

Overwhelmed by the excitement

Mann says that FSN was better than she had imagined it could be. "I was overwhelmed at the excitement and the intense focus of students at the stations. The most surprising part of the evening was seeing how involved the parents, and even the grandparents, became in the experiments. It was truly a family event," she says. "The focus and perseverance I witnessed even among young students was remarkable. And I will never forget the incredulous joy my kindergartners expressed when they pushed a skewer through a balloon and it didn't pop!"

Mark and Joanne also organized several extra exhibits, including a rocket launch, mini Van de Graaff generator for levitating and repelling lightweight conductive objects, reversible thermoelectric generator, vortex tube, balloon helicopter, and atmospheric mat. To encourage attendance, they donated a one-year family membership to the Chabot Space and Science Center as a raffle prize.

The point of it all — both FSN and Mark and Joanne's efforts — is to spark a lasting curiosity in science.

"It has been our delight to cultivate academic and life skills in at-risk kids: to speak words of confidence and possibility into their lives, to ascribe high value to them, and to hold up high expectations for them. We also work hard to plant aspirations that could be held for years to come, to help kids envision a different future for themselves and to encourage them to pursue their goals relentlessly," says Mark.

"It is our hope and dream that, ultimately, we could help a girl see that she could become a computer scientist, writing computer code when she grows up — rather than conforming to the 'code of the street.' Likewise, we would be thrilled if we could help a boy grow up knowing that he can earn respect because of his social, scientific, or artistic contributions — rather than demand respect because he possesses the most powerful firearms on the street."

JOANNE AND MARK PERRA look on as Ta'Jir Golden keeps a foil loop aloft with the mini Van de Graaff generator. In retirement, the couple has become very involved in science education in Oakland public schools. (Photo by Dino Vournas)

Benefits update

Toll-free Nurseline numbers provide immediate care for Sandia Total Health members

Around-the-clock, toll-free support

Each of the three Sandia Total Health administrators offer a toll-free number that connects you with a registered nurse who will take the time to understand what is going on with your health and provide personalized information that is right for you. Services are available 24 hours a day, seven days a week, at no additional cost to you. It is included in your benefits.

Not sure if you need a doctor, urgent care clinic, or just some good health advice? One call can help you get information about the care and services you need. Think of it as your one-stop resource to help you make smart health-care decisions every day.

When should you call?

Whether you have a baby with a 102 temperature at midnight or need help managing your diabetes, these toll-free Nurseline numbers are your source to give you the answers you need. These services can help you or a covered family member get answers to health problem questions, such as:

- Asthma, back pain, or chronic health issues
- Dizziness or severe headaches
- High fever
- A baby's nonstop crying
- Cuts or burns
- Sore throat

Although this service is not a substitute for doctor's care, these toll-free Nurseline numbers can optimize your medical costs by helping you choose the appropriate time and place for care.

BCBSNM 24/7 Nurseline

Health concerns do not always follow a 9-to-5 schedule. Fortunately, Blue Cross Blue Shield registered nurses are on call to answer your health questions, wherever you may be, 24 hours a day, seven days a week. The Blue Cross Blue Shield 24/7 Nurseline's registered nurses can understand your health concerns and give general health tips. Call the Blue Cross Blue Shield Nurseline at 800-973-6329.

UHC myNurseLine

When you have a health concern, it can be difficult and time-consuming to find the information you need. The UHC myNurseLine, available 24 hours a day, seven days a week, can help you make smart health-care decisions with immediate telephone and online access to experienced registered nurses.

MyNurseLine nurses have an average of 15 years clinical nursing experience. They are an excellent resource when you need help choosing care, managing a chronic condition, understanding treatment options, and more. To talk with a UHC myNurseLine nurse call 800-563-0416.

Kaiser Advice Nurses

The Kaiser Advice Nurses are registered nurses specially trained to help assess medical problems and provide advice over the phone, when medically appropriate. They can often resolve a minor concern or advise you on what to do next, including making a same-day or next-day appointment.

Kaiser Advice Nurses are available 24 hours a day, seven days a week. To reach an Advice Nurse, call one of the following appointment and advice numbers in your area:

- Antioch Medical Center (925) 813-3100
- Fremont Medical Center (510) 795-3055
- Fresno Medical Center (559) 448-4555
- Hayward Medical Center (510) 675-4010
- Manteca Medical Center and Offices (209) 824-5051
- Modesto Medical Offices (209) 557-1650
- Oakland Medical Center (510) 752-1190
- Redwood City Medical Center (650) 299-2015
- Richmond Medical Center (510) 307-1555
- Roseville Medical Center (916) 784-4148
- Sacramento Medical Center (916) 973-5243
- San Francisco Medical Center (415) 833-2200
- San Jose Medical Center (408) 362-4740
- San Rafael Medical Center (415) 444-2940
- Santa Clara Medical Center (408) 554-9800
- Santa Rosa Medical Center (707) 571-4044
- South Sacramento Medical Center (916) 688-2106
- South San Francisco Medical Center (650) 742-2100
- Stockton Medical Offices (209) 476-2080
- Vallejo Medical Center (707) 651-1025
- Walnut Creek Medical Center (925) 295-4070
- **For the hearing/speech impaired 711 (TTY)**

Preventive care under Sandia Total Health covered at 100 percent

What is preventive care and how does it work?

Preventive care includes services like a physical exam each calendar year and certain cancer screenings used in advance of symptoms to help prevent illnesses or injuries before they occur. At Sandia, we understand that the healthier you are, the less money you spend on health care.

That is why we offer preventive care with our current health plan — and why Sandia Total Health also covers a wide range of preventive care services at 100 percent with no deductible to meet, as long as you visit an in-network or Health Partner Network (HPN) provider (BCBSNM members only). For example, you are eligible for one annual well-person exam regardless of whether you have any type of chronic illness or condition, such as high blood pressure or diabetes.

Other preventive care services covered at 100 percent under Sandia Total Health include:

- Well-baby, well-child, well-woman exam*
- Bone density test (osteoporosis screening)*
- Colon cancer screening*
- Diabetes screening*
- Immunization / vaccine*
- Mammogram*
- Prostate Antigen Test (PSA) *

To review the entire list of all preventive care services covered at 100 percent under Sandia Total Health, including certain restrictions*, go to hbe.sandia.gov and search "preventive care."

Coding preventive care

To receive the preventive care benefit, talk to your provider about Sandia's commitment to covering preventive visits at 100 percent so that they understand to use the preventive ICD-9 code. It is solely up to the provider as to whether the service is coded as preventive or diagnostic. Neither Sandia nor the claims administrator can direct the provider to bill a service in any particular way. Annual in-network routine physicals should be paid at 100 percent whether it is coded by a physician as preventive or preventive/diagnostic.

Note: If you have a preventive visit and are charged for that service, call your claims administrator (BCBSNM, UHC, or Kaiser) for assistance.
Go to hbe.sandia.gov and search "preventive care" to review the entire list of all preventive care services covered at 100 percent under Sandia Total Health.

BCBSNM and UHC onsite customer advocates available to all Sandia employees

Sandia is pleased to offer employees enrolled in Sandia Total Health administered by Blue Cross Blue Shield of New Mexico (BCBSNM) and UnitedHealthcare (UHC) an incredible resource available either onsite in Albuquerque or by phone. Employees enrolled in these plans can visit the BCBSNM and UHC onsite customer advocate to help them with unresolved medical issues or explain how their plan works.
The BCBSNM customer advocate is Leah Stewart; the UHC customer advocate is Matthew Shivadecker. Both are located in HBE Medical 832 building in Albuquerque.
If you feel that your questions or concerns were not resolved after you called your health plan administrator's customer service number (provided at the end of this article), the BCBSNM and UHC onsite customer advocates can help you with the following:

Medical claims

- Discuss medical bills received from your medical providers (walk-in and appointments always welcome)
- Help to understand your Explanation of Benefit (EOB)
- Review differences between the patient share on an EOB vs. amount the provider is billing you
- Discuss discrepancies between the quoted benefit and what was actually applied on the claim
- Contact your medical provider if there appears to be a discrepancy between a bill you received from your provider's office and the processing of your medical claim
- Explanation and education on processes and benefits related to your claim
- Advise/direct you on how to communicate with your provider regarding medical claims and billings
- Provide information on submitting appeals

Sandia Total Health

- Provide suggestions on how to effectively use your plan to optimize your benefits
- Provide coverage information for a specific procedure/service
- Estimate out-of-pocket expense for an upcoming service using the cost estimator tools
- Look up current accumulations of plan year deductibles, coinsurance, and out-of-pocket maximums
- Explain the differences between the in-network tier and the new Sandia Health Partner Network (HPN) — BCBSNM only

Health Reimbursement Account and Health Care Flexible Spending Account

- Meet/speak with you regarding your Health Reimbursement Account (HRA) and/or Health Care Flexible Spending Account (FSA)
- Provide information on how accounts can be utilized to receive your optimum benefit
- Help submitting manual claims for reimburse - ment if necessary

Website help

- Help navigating www.bcbsnm.com/sandia and www.myuhc.com
- Locating claim forms, provider lookup tools, and benefit summaries
- Review the registration process or the information available if already signed up

Employees may visit the onsite customer advocates at Thunderbird Café.
Beginning Monday, July 2, 2012, Matt and Leah are setting up tables at Thunderbird Café to meet with Sandians and discuss Sandia Total Health plan details, accessing and navigating their websites, and other non-claims-related items. Personal issues related to claims processing should be discussed in the privacy of their offices listed below. The BCBSNM and UHC customer advocates will be at the Thunderbird Café every Monday and Thursday, 11 a.m.-12:30 p.m.

BCBSNM Contact Options:

- BCBSNM customer service: 877-498-SNLB (7652)
- www.BCBSNM.com/sandia — Sandia-dedicated BCBSNM website
- Sandia-dedicated onsite customer advocate — Leah Stewart
- Office hours: Monday and Thursday 8 a.m.-4 p.m. MT
- Office: SNL Albuquerque, Bldg. 832, Rm. 33A
- Phone: 505-284-8669
- Email: leah_stewart@bcbsnm.com

UHC Contact Options:

- UHC customer service: 877-835-9855
- www.Myuhc.com – Online inquiries through secure messaging
- Sandia-dedicated onsite customer advocate — Matt Shivadecker
- Office hours: Monday-Thursday 7 a.m.- 3 p.m. MT
- Office: SNL Albuquerque, Bldg. 832, Rm. 33B
- Phone: 505-844-0657
- Email: matthew_e_shivadecker@uhc.com

ACS on Campus bringing program to Sandia postdocs, interns

By Sue Major Holmes

The American Chemical Society's ACS on Campus is bringing workshops on career development and resources for scientists and engineers to Sandia's postdocs and interns, only the second time the program has come to a national laboratory.

ACS on Campus will kick off the evening of July 19 with a Science Café presentation and a panel discussion on alternative careers in science. The daylong program July 20 at the Computer Science Research Institute, Rm. 90, videolinked to California, includes workshops on publishing, writing grant proposals, using ACS's SciFinder to find collaborative research opportunities, careers in industry and higher education, and effectively communicating about why science matters.

Registration is free at pubs.acs.org/r/acsoc. Postdocs and interns can send questions to ACSonCampus@acs.org.

SANDIA POSTDOCTORAL APPOINTEES Stephanie Teich-McGoldrick (6915) and Morgan Alley (6823) are helping organize ACS on Campus, which will bring career development workshops to the Labs on July 19-20. It will be only the second time the American Chemical Society has brought the program to a national laboratory. (Photo by Randy Montoya)

The outreach program will offer the ACS resources to the Labs' estimated 200 postdocs and 300 to 400 student interns, who are split between New Mexico and California. The event is being presented in coordination with Sandia's Postdoctoral Professional Development Program, known as PD2P.

"The message that we're getting from our leadership is that this is an important program of value to our next generation of scientists," says Jennifer Taylor Howell, program manager in the ACS Membership and Scientific Advancement Division, who is helping organize the event. "These are the people we're looking at to lead us. We certainly want to invest in them."

The postdoc community in particular is living between two worlds, says postdoc Stephanie Teich-McGoldrick (6915), PD2P workshop chair in New Mexico. She and postdoc Morgan Alley (6823), PD2P statistics chair, are helping organize the ACS event.

Sandia's postdoctoral appointees are temporary employees who recently received PhDs. They come to the Labs to develop additional technical and professional skills, says Stephanie, who has been with Sandia nearly two years.

"ACS is great for us," she says. "It's a full day of program material that would be very hard to do ourselves."

Sandia's chief technology officer, Div. 1000 VP Steve Rottler, says Sandia is grateful for the support from ACS and PD2P.

"This event will provide our postdoctoral employees and student interns with valuable career-planning information and give them an equally valuable opportunity to network with other professionals," Steve says. "We are excited this event is coming to Sandia, and hope that all of our postdoctoral employees and student interns will participate in the event activities."

Postdoc Heather Jackson (8252), PD2P workshop chair in California, says she's excited about any program that will help postdocs.

"I think that our mission as PD2P is really to promote these types of interpersonal skills and get postdocs thinking about career development, not just thinking about their technical skills," says Heather, who has been at Sandia just over two years.

ACS on Campus made its debut in 2010 at Vanderbilt University in Nashville, Tenn., and has been presented around the nation and overseas in such countries as Germany, Italy, and China. It travels to Los Alamos National Laboratory on July 23-24.

ACS first presented the program at a national lab in July 2011 at Argonne National Laboratory in Illinois. It went well, and ACS representatives asked manager Nancy Jackson (6823), the immediate past president of ACS, if Sandia would be interested in a similar program. Nancy talked to Morgan because she knew he'd recently joined PD2P's planning committee.

"It's an opportunity for career development information and resources for graduate students and postdocs," says Morgan, who has been at Sandia about eight months. "It's a networking event as well, which is always important."

The campus program grew out of an idea by the ACS publications division, which wanted to educate researchers about the best way to publish scholarly papers, Nancy says. That evolved into offering workshops at universities, including ethics in publishing and an insider's perspective from editors about what they look for in a technical paper.

Those topics help both writers and publishers. Students — and in Sandia's case, early career workers — learn the ins and outs of a good technical paper and editors receive better submissions, Nancy says.

The basics of ACS on Campus don't change just because it's presented at a national laboratory.

"All the ACS on Campus programs are focused toward students and postdocs; that's who they've invited," Nancy says. "So they don't have to change a whole lot. There are so many students and postdocs at the national labs that it's a good place to get in touch with them also."

ACS wants students to gain new skills and an awareness of what resources are available so they're better equipped to advance in their careers, Howell says.

"The goal is to help build community and help the next generation of scientists moving forward," she says. "The American Chemical Society is invested in the future of the science."

Although ACS is behind the event, the workshops have been tailored to interest postdocs and student interns from all disciplines. Scientific and engineering specialties outside of chemistry and related fields also have professional organizations where students in those fields can find a home, Howell says.

"This is a way to build your network, this is a way to learn about the core fundamentals that are needed in your scientific career," she says. "You can't have too many resources."

Sandia staff who want to attend the workshops also are welcome, Nancy and Howell say. Publishing tips, for example, are useful to anyone. "That, in particular, I recommend for young staff or staff who are getting back into something where they will be publishing," Nancy says.

Nancy and Center 1500 Director Duane Dimos will give opening remarks. Duane likes the idea of helping students and postdocs think about their careers.

"It looks to me like a good opportunity to bring something to Sandia we haven't had before that will be good for our postdocs," he says.

ACS publishes 39 journals and is the largest professional organization in the world with more than 164,000 members. PD2P, which began in 2007, provides a way for Sandia's postdoc community to meet each other and develop professional skills. Sandia's Student Intern Program has year-round, summer, and academic year co-op programs in technical and business-related opportunities for students from high school to PhD candidates.

Sandia National Laboratories ACS on Campus Agenda

Thursday, July 19

7-8 p.m.
Science Café Presentation
8-9 p.m.
Alternative Careers in Science Panel Discussion
9-10 p.m.
Networking

Friday, July 20
8:30 a.m.-5 p.m. MDT

8:30-9 a.m.
Registration
9-9:30 a.m.
Welcome and Opening Remarks
9:30-11 a.m.
Publishing from an Insider's Perspective
11 a.m.-noon
Writing Excellent Grant Proposals
Noon-12:30 p.m.
Lunch
12:30-1:30 pm
SciFinder Session
1:30-3:30 pm
ACS Career Pathways: Finding Your Path in Industry or Higher Education
3:30-4:55 p.m.
What is It You Do Again? Why Effectively Communicating Your Science Matters
4:55-5 p.m.
Closing Remarks

ACS Chemistry for Life®

Climate Change and National Security Speaker Series

MIT climate skeptic speaks at Sandia

By Neal Singer

Massachusetts Institute of Technology professor Richard Lindzen, a global warming skeptic, told about 70 Sandia researchers in the 2nd floor lecture room of 858EL in early June that too much was being made out of climate change by researchers seeking government funding. He said their data and their methods were insufficient to support their claims.

"Despite [these researchers'] concerns over the last decades with the greenhouse process, they oversimplify the effect," he said of scientists who act as though global warming is already in process and the result of carbon dioxide emissions. "Simply cranking up CO_2 [as the explanation] is not the answer."

Lindzen, the ninth speaker in Sandia's Climate Change and National Security Speaker Series, is Alfred P. Sloan Professor of Meteorology in MIT's Department of Earth, Atmospheric, and Planetary Sciences. He has published more than 200 scientific papers and is the lead author of Chapter 7 ("Physical Climate Processes and Feedbacks") of the International Panel on Climate Change's (IPCC) Third Assessment Report. Among other honors, he is a member of the National Academy of Sciences and a Fellow of the American Geophysical Union and the American Meteorology Society.

> *"Despite [these researchers'] concerns over the last decades with the greenhouse process, they oversimplify the effect."*
>
> — Richard Lindzen

Speaking slowly and methodically with flashes of humor — "I always feel that when the conversation turns to weather, people are bored"— he said that a basic problem with current computer climate models that show disastrous increases in temperature is that "relatively small variations in positive feedback [from atmospheric gases] lead to large changes in [model temperature] response. For negative or small positive feedbacks, change is small. It's the positive feedbacks in the models that lead to large [predicted] results."

How believable are the large positive feedbacks showing dramatic climate change? Lindzen said, "Predictions based on high [climate] sensitivity ran well ahead of observations."

Modeling greenhouse gasses

All IPCC models display large positive changes, which imply feedback from gasses is increasing, but real-world observations do not support this, he said. "We've already seen a doubling of CO_2 that has produced very little warming."

He disparaged proving the worth of models by successfully applying their criteria to the prediction of past climatic events. He said, "The models [in those uses] are no more valuable than answering a test when you have the questions in advance." Modelers, he said, merely have used aerosols as a kind of fudge factor to make their models come out right.

For 30 years, he said, climate scientists have been "locked into a simple-minded identification of climate with greenhouse gas level…. That climate should be the function of a single parameter [like CO_2] has always seemed implausible. Yet an obsessive focus on such an obvious oversimplification has likely set back progress by decades."

More likely the greater effect on climate than CO_2, he said, is the amount of polar ice that survives any given summer.

He felt that there is little evidence that changes in climate are producing extreme weather events. "Even the IPCC says there is little if any evidence of this. In fact, there are important physical reasons for doubting such anticipations."

He posited that in a warmer climate, there would be reduced temperature difference between the poles. Since it's believed to be differences in temperature that cause extratropical storms and other extreme weather events, there would seem to be less reason for extreme events, not more. "Thus, on physical grounds, most of us should expect reduced intensity of storms and variability. However, this apparently is not 'alarming,' so the opposite is asserted."

Then there is the question of what, practically speaking, can be done about temperature increases if indeed they are occurring, he said. "China, India, Korea are not going to go along with IPCC recommendations, so [nothing effective can be done] and the only countries punished will be those who go along with the recommendations."

National security implications

In terms of national security, he said that "historically there is little evidence of natural disasters leading to war, but economic conditions have proven much more serious. [Yet] almost all proposed mitigation policies lead to reduced energy availability and higher energy costs. All studies of human benefit and national security perspectives show that increased energy is important."

He showed a PowerPoint graph from a study that showed that more energy consumption leads to higher literacy rate, lower infant mortality, and a lower number of children per woman.

Given, he said, that proposed policies are unlikely to significantly influence climate and that lower energy availability could be considered a significant threat to national security, to continue with a mitigation policy that lowers available energy "would, at the least, appear to be irresponsible."

In answer to audience questions about rising temperatures, he said, "0.8 [of a degree C] change in temperature in 150 years — nothing changes the basic fact that you're looking at small change."

Questioned by his audience about five, seven, and 17-year averages that seem to show that Earth's surface temperature is rising, he said, "I can understand if a baseball fan obsesses with averages that vary by one decimal point, .356 or .354, but with temperature, tenths of a degree, it's always fluctuating that much."

Future uncertainty

As for the future, "Uncertainty plays a huge role in this issue. It's not that we expect disaster, it's that the uncertainty is said to offer the possibility of disaster: Implausible, but high consequence. Somewhere it has to be like the possible asteroid impact: Live with it."

To a sympathetic questioner who said, "You are like a voice crying in the wilderness. It must be hard to get published," Lindzen said that billions of dollars go into funding climate studies and that "The reward for solving problems is that your funding gets cut. It's not a good incentive structure."

That Lindzen may feel scientifically isolated is understandable because almost all major professional societies have come out counter to his position. But he doesn't feel they are necessarily right. "Why did the American Physical Society take a position?" he asked his audience rhetorically. ["The evidence is incontrovertible: Global warming is occurring," said the APS statement on Nov. 18, 2007 in part.] Why did they find it compelling? They never answered."

Europe's attachment to espousing climate change is more cynical, he believes. "They'll drop it on a dime once it has no advantage. Science latched on to this as a shooting star, but it is a losing, losing operation. This is a tiny field with a meager record of accomplishment but in the US alone it has gotten $80 billion in funding. If you're studying butterflies, it must say butterflies and global warming [to increase your chance of funding]. Biology survived the war on cancer by figuring out how to do biology and cancer [but] it's harder to adjust high-energy physics to climate change."

Responding to global warming

It may be that science has "entered a silly season" with global warming, he said, which it would regret later.

To later questions as to whether the prudent approach to possible climate change would be to prepare a gradated series of responses, much as insurance companies do when they insure cars or houses against wrecks or fires, Lindzen did not shift from his position that nothing needs doing until more data is gathered.

To another Sandian who pointed out the large number of models by researchers around the world that suggest increases in world temperature, Lindzen responded he was doubtful that the models were independently derived but instead might produce common results because of their common origins.

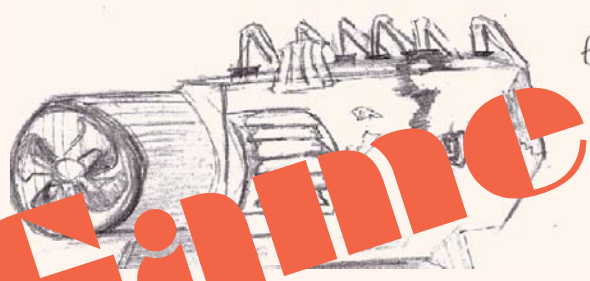
Asked by Center 1400 director and speaker series host Rob Leland, "What is the most constructive thing we could do at this point?" Lindzen responded that maybe the best thing would be to take science funding back to the time between post-WWII and the mid-60s, with longer grant times and fewer and shorter applications. "We'd see a gush of productivity, not about CO_2 but how does climate work?

"Because we knew so little, we were vulnerable."

The Climate Security lecture series is funded by Sandia's Energy, Climate and Infrastructure Security division. Rob Leland is director of Sandia's Climate Security Program.

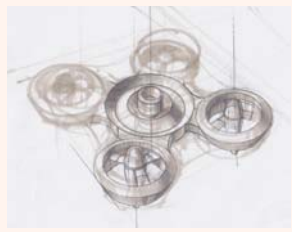
Dog day afternoon

THESE COYOTE PUPS ROMP in front of their ready-made, cozy den in a culvert outside the Ion Beam Laboratory. While not seen in this photo, the coyote mom has been observed dutifully bringing food to her pups. The Labs' wildlife biologists remind members of the workforce not to approach, feed, or in any way interact with wild animals. (Photo by Daniel Perry)



Game on!

UNM video game developers tap Sandia whiz as mentor



Story by Nancy Salem

A group of students in the University of New Mexico's Interdisciplinary Film and Digital Media program wanted to do something different when the time came to pick a senior capstone project. Film is the norm. They went with a video game.

THEY GOT GAME — Sandia computer science engineer Jon Whetzel (1463) sits at the controls of the video game Alloy with interns, from left, Hannah Gillis, Carol Payne (both 1932), and Jeremy Bernstein (1463). The Sandia interns were on the University of New Mexico Interdisciplinary Film and Digital Media team that developed Alloy as its senior capstone project. Jon was the mentor who guided the group to success. "He went above and beyond," says Hannah. "I can't say how lucky we were. He was with us every step of the way." (Photo by Randy Montoya)

"I'm a filmmaker, so when students select film, I'm ready to go," says Albuquerque producer/director Charlie O'Dowd, who heads up capstone, a yearlong senior project done in addition to regular schoolwork. "But this group wanted to make a game, a game that was playable. We had to find them a mentor."

UNM turned to Sandia's Jon Whetzel (1463), a senior member of technical staff who develops video games for training, research, and other purposes. "Jon was so amenable to working with young people and giving an immense amount of his time and energy," O'Dowd says. "He was perfect."

Jon guided the fledgling game developers to a successful launch, and several have joined Sandia as interns. And O'Dowd says the project led to talks of an expanded video game development program at IFDM with stronger ties to Sandia.

"There's a natural relationship there," O'Dowd says. "We could use expertise from Sandia, and we have students available for internships."

UNM knew of Jon through the gaming community, where he is head of the Rio Grande chapter of the International Game Developers Association. "They came to me last September when they needed to get started. I was definitely flattered they wanted me," Jon says. "And I was really intrigued at the idea for their game."

The game is called Alloy, and the setting is an industrial planet turned to rubble by a comet collision. The player controls a BuilderBot that moves around the game world assembling helper robots from pieces of disassembled ones and fighting off other BuilderBots. The player earns points toward winning the game and being the last bot standing.

"Here was a really challenging problem. How do you set it up so you have all different combinations of robots?" Jon says. "You don't just stick on different pieces with different actions. There are challenges with artificial intelligence to create unique personalities. How do you incorporate that together in a game and in the time frame given?"

ART AND CRAFT— The image at left is a BuilderBot in game mode on a custom-designed level with original artwork and environment development. At right is a detail from concept art for the environment and gameplay of Alloy. The sequence of images below left are part of an animation of the comet that hit the planet and ignited robot life in the game. The drawings in the upper left and right corners of the page are development sketches of game details.

A blending of talents

About 40 people worked on Alloy in four teams: art, technical, sound, and communication. The fall semester was spent refining the game idea and producing a small prototype. The students took the concept and built the full game in the spring.

Sandia intern Hannah Gillis (1932) was the project producer. "I shepherded the process through all phases of production," she says. "I learned a ton."

She chose Alloy because she wanted a capstone project that "highlighted everybody's unique abilities." The game brought together skills in animation, modeling, visualization, artificial intelligence, and programming. The team also developed a business plan around marketing, advertising, and website development.

"It was the perfect combination of everyone's talents," Hannah says.

The team crafted the Alloy concept into an interactive environment with the professional game development engine Unreal. "It's a complex tool and it required a lot of effort on their part to dig into the details and figure out how to use it to accomplish what they wanted in the game," Jon says. "They surprised me with what they were able to figure out."

Jeremy Bernstein (1463), an intern in Jon's group doing video game research, was technical lead in charge of programming. Like the other students, he had no training or background in game development. "There was a lot of trial and error," he says.

Unreal provides the environment in which to place art assets that are made to behave through code. "We took assets from the art team and put them in the world, then hooked up animations with certain actions," Jeremy says. "The technical side is making sure that for every action there is a reaction. We had to program the algorithms for handling the AI, physics, and visuals to make sure the bots and the flow of the game behaved the way we intended."

The students met four times a week, and Jon was at most of those sessions going over progress and technical and production challenges. They'd sometimes hold a "Weekend of Alloy," blocking out an entire weekend to work on the project. "Students were in the lab from sunup to sundown," Jon says. "I'd be there for hours helping with problems."

Juvenile diabetes fundraiser

Alloy was finished in early May. It can be downloaded and played at alloyvideogame.com at no charge. Users can donate through the site to the Juvenile Diabetes Research Foundation.

Sandia intern Carol Payne (1932), Alloy's communications lead, says her job was website development and doing a documentary for the site. "We want other students to follow in our footsteps," she says. "We made sure we documented what we did."

She says Alloy is being promoted through social media including Facebook and Twitter, and that people are downloading the game, which was designed to be nonviolent because of the connection to the JDRF and to show that games don't have to be violent to be fun.

Hannah says several hundred dollars has been raised so far for the diabetes foundation. The goal is $1,500.

Hannah, Carol, and Jeremy say Alloy would not have been possible without Jon's help.

"He went above and beyond," says Hannah, who is working toward an MBA at UNM's Anderson School of Management while continuing her Sandia internship. Hannah's mother, Linda Gillis, recently retired from the Labs as a policy analyst after 22 years. "I can't say how lucky we were. He was with us every step of the way. We called it the aura of productivity. When he was around, things would go really well. He made everything click."

Carol, who completes her Sandia internship at the end of the summer and has taken a job with the Albuquerque visual effects company Pivot VFX, says Jon was the perfect mentor because he didn't do the students' work, but guided them to solutions. "He kept us motivated and right on track," she says.

"Having Jon there was invaluable," says Jeremy, who has one year to go at UNM for a degree in computer science. "He pushed us in areas where we were lacking."

Jon says he's encouraging the group to submit Alloy to independent game festivals and competitions. "It's an interesting and fun game," he says. "They did a great job executing and putting it together."

He says his involvement was enjoyable — and educational.

"The students were so excited and so passionate about the whole process," he says. "I learned things from them."