An abrupt bang, a bright blue flash, and a loud cheer marked the 10,000th operation of Sandia’s Annular Core Research Reactor (ACRR). About 150 people gathered in Tech Area V on Sept. 8 to celebrate the milestone for Sandia’s research reactor.

In its 32 year history, the ACRR has been a valuable resource for an incredibly wide variety of experiments. With a dry, nine-inch diameter cavity in the core’s center, and a 20-inch diameter external cavity, the ACRR’s primary missions are to subject electronics to high-intensity neutron irradiation environments and conduct reactor-safety research. The ACRR has also provided testing support to organizations as varied as semiconductor manufacturers, NASA, and recently, the Large Hadron Collider in Switzerland.

“The ACRR has been a real workhorse for Sandia. ACRR supports stockpile stewardship activities concerning terminal-phase, hostile, and fratricide effects. Lab leadership relies on these and other weapons-component testing done at Sandia to support certification of the nuclear weapon stockpile,” says Lonnie Martin (1381), an ACRR operator. ACRR is a water-moderated, water-cooled nuclear research reactor. It is a small, low-power reactor with a fission power of about 30 kWt. ACRR’s core is a ring-shaped stainless steel structure with a diameter of 12 inches. It can be loaded with a variety of test components placed in a central cavity, with neutron flux and spectra tailored for the experiment. ACRR contains uranium and Plutonium-239 and is fueled with Plutonium-239.

(Continued on page 6)
The photos were alarming. A day or so after Steve Jobs announced he was stepping down from a day-to-day leadership role at Apple because of health concerns, a photo started circulating around the web showing a startlingly frail-looking Jobs. The photo was captioned with the text: “Steve Jobs seems very much a turn for the worse. Let’s hope that he recovers his health soon and pick up his remarkable career where he left off, leading the most successful and innovative technology company in the world for another 20 or more years.”

As it happens, and why I bring up Steve Jobs in the Lab News, is that he once posed a hypothetical question to a job prospect that seems to me to be very relevant for Sandians. John Sculley, who served as Apple's CEO from 1983 to 1993, tells the story in his book Odyssey: In the early 1980s, Apple — started by Steve Jobs and Steve Wozniak in a garage just a few years before — was growing so fast that the board of directors felt it was time to bring in a business executive as CEO. The top prospect was John Sculley, then the head honcho at PepsiCo, one of the biggest and most recognizable companies in the world. Sculley was a marketing guy, very much at home in the world of soft-drinks and fast food restaurants. He had a good thing going at PepsiCo, where, with his hip and savvy ideas, he had become its youngest-ever marketing VP and then its youngest-ever president. Steve Jobs, always uncompromising in his quest for the best, had decided that Sculley was the man for Apple, and he went after him like a suitor. Sculley was ambivalent: Was this PC phenomenon for real? Was it a fad that would soon blow over, the electronic version of the hula hoop or pet rock? Was this something to hitch a career to? Sensing his reluctance, Jobs put it to Sculley in blunt terms, as was his way: “Do you want to sell sugar water for the rest of your life, or do you want to come and change the world with me?” As Sculley tells it, when Jobs laid out the options so starkly, Sculley was convinced; he joined Apple and led the company (with mixed success) for almost a decade. What would he have done with Steve Jobs? Well, I think we can all pose the Jobs question to ourselves, particularly those of us doing the hard mission work that protects this nation’s security. For many of our best people, there are other ways to come out there than the normal career setting. But it? don’t think there are many places where, day-in, day-out, what you do at work is so consequential. That was true during the years of the Cold War, and it’s been true since. As we approached the 9/11 anniversary of the first issue of the Lab News two weeks ago, Sandians have made profoundly important contributions in the war on terror and in keeping America safe in a complex and dangerous world. Jobs, with his vision and the force of his personality, certainly changed our world. But we at Sandia have, too. And we’ll continue to do so. I’d rather be here than selling sugar water somewhere, that’s for sure.

Speaking of Jobs, I read a note about his success that struck a chord with me: Jobs — and Apple — have been wildly successful not because they give consumers what they want, but because they deliver products that consumers didn’t know they wanted and then make them wonder how they ever lived without them. So let me repeat what I said above: I hope Jobs recovers his health and returns to Apple; I can’t wait to see what he brings in the future.

Do you eat your lunch at your desk? If so, you may be missing your health, your relationships, and even your career. Or, at least that’s the assertion in a new study that says we all need to get up from our desks in the middle of the workday and seek out a total change of scenery. Move around a bit. Exercise with your fellow workers in a different, stress-free setting. Sounds like good advice to me. Now excuse me, my sandwich is calling.

See you next time.

— Bill Murphy (505-845-0845, MS0165, wtmurphy@sandia.gov)
Nearly $1 billion in economic activity in California generated by Sandia in 2010, according to new report

By Mike James

Sandia generated nearly $1 billion in both direct and indirect economic output in the state of California in 2010 with nearly half coming from the San Francisco Bay Area, according to a new report prepared by the Center for Economic Development (CED) at California State University-Chico.

“Some would say this is the best year on record for Sandia, but the good news is that it is the best year on record for the state of California,” says Sandia’s senior manager of human resources and business operations at Sandia/California, Denise Koker (8520), senior manager of human resources and business operations at Sandia/California, who announced the site’s goal to raise $250,000 this year for non-profit agencies of employees’ choosing.

“This year we’re going to wear a lyca suit to reduce the drag coefficient,” says Rick.

The grand prize is $100 for both Div. 8000 and Center 8100, directed to the charity of each center’s senior management associate’s choosing. Ann Stayton (8000) chose Canine Companions for Independence and Michelle Clark (8500) chose the Wounded Warrior Project.

Along with the fun, there were some serious words about SHARE and the growing needs of the community. Rick announced the site’s goal to raise $250,000 this year for non-profit agencies of employees’ choosing.

“The funds you raise do amazing things,” said Dave Rice, president of the Tri Valley Community Foundation (TVCF), Sandia’s partner in the SHARE campaign for the past 18 years. He noted that in the last eight years, donations made by Sandia employees have helped 600 students who had been high school dropouts earn their General Education Diploma. Even more impressive, more than 250 of those students have now earned their four-year college degree.

Attendees bid on silent auction baskets, donated by TVCF, with themes like gardening, wine, cat, dogs, family fun, and movie night. The baskets also earned for their organization a Lockhead Martin contribution of between $100 and $500, depending on the number of hours volunteered.

The Community Service Award winners are: Melissa Betz (8135), Linda Houston (8500), Blake Simmons (8630), and Len Napolitano (8900). Jim and Len won their heats and rode against Div. 8000 VP Rick Stulen in the final race, with Jim finishing in first followed closely by Rick. Jim and Blake also rode in the senior managers’ race, along with Art Pontau (8660), Tim Shephord (8223), John Garcia (8510), and Jim Costa (8950). Proving that experience matters, Tim and Blake won their heats and rode against Rick in the final race. After a photo finish, Jim and Rick were both declared winners and will share ownership of the golden tricycle trophy.

“Next year I’m going to wear a lyca suit to reduce the drag coefficient,” says Rick.

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“Next year I’m going to wear a lyca suit to reduce the drag coefficient,” says Rick.
The recent Security Learning and Feedback Activity (SEC2011) discussions offered members of the workforce an opportunity to let leadership hear exactly what they had to say about security, and to engage managers directly in discussion, says Mike Schaller (4200), senior manager for Security Operations.

One of the best initial results of the five weeks of SEC2011 was that many organizations decided to start engaging in regular dialogues on security. Managers have asked for additional scenarios to use in upcoming department meetings, Mike says. In addition, Security Operations already plans to provide the workforce with additional information about security trends.

“Ultimately, Security Operations and Labs management recognized that, as a national laboratory, we are missing something if we see the same types of incidents repeated over and over again,” Mike says.

Security Operations intends to take all the feedback and review it carefully, he adds. Some of the information will go to Labs management, best practices will be shared with the workforce, and some questions will be answered individually.

“Ultimately, Security Operations and Labs management recognized that, as a national laboratory, we are missing something if we see the same types of incidents repeated over and over again.”

Mike Schaller

Managers generally liked the interactive format of the learning activity and said in their feedback that members of the workforce seemed to get much more out of the dialogues than a standard classroom or online training session. As a result, Mike says he and his team are discussing the notion of making security training interactive every year, similar to the annual ethics training.

Mike says he and his team will work on improvements. Managers asked for video scenarios and more interactive tools, either to use on their own or for future manager-led sessions. “We had a couple of weeks to design and launch the activity and we’re very happy with it,” he adds. “We are committed to keeping the momentum and developing the most effective tools possible for the future.”

Overall, the feedback received was “better than we expected,” Mike says. The security team especially appreciated some of the best practices that groups sent in as a result of the training activity. Among those were the following:

* Our department has a policy not to forward anything with an attachment that you didn’t originate yourself. In other words, if an email has an attachment you want to share, you must save the attachment and begin a fresh email. This forces us to think about what we’re attaching and prevents assimilation issues.
* Many security issues have a common thread of being rushed. Our department discussed that when we are doing classified work, it has priority, period.

“Our department agreed to re-examine our monitoring procedures for completeness, with special attention to our Friday monitoring procedures and classified workstations.”

Mike Schaller (4200), senior manager for Security Operations.

The nature and scope of the problem.

Some asked what Labs management and Sandia’s security professionals see as the major factors contributing to recent security incidents. Although most contributing factors were incorporated into the training, Mike agrees that his team needs to focus and reduce the number of security incidents and wanted additional context to understand the nature and severity of security incidents.

In conjunction with her announcement of Mike’s new position, Kim noted that as part of the Mission Support restructuring, Management Systems & Support Center 9700 has been eliminated and its functions merged with the new Mission Support & Corporate Governance Center 700. The new center’s mission is to lead assurance improvement and to drive implementation across the Laboratories.

Kim announced that Pat Smith, who had served as acting VP in Div. 9000, has been selected as the director of Center 700. In this position, Pat also will serve in the role of corporate comptroller.

Kim offered her appreciation to Pat for her role as acting VP in Div. 9000 since late February. “When Pat came on board,” Kim said in her message to members of the workforce, “I gave her three objectives: 1) ensure a smooth transition; 2) close out the HS-64 audit; and 3) achieve clarity on assurance. Pat delivered on all three objectives and has become an integral leader in our assurance journey.”

Kim also thanked Art Hale for serving as Sandia’s chief information officer for the past four-and-a-half years, and for serving as acting director of Management Systems & Support Center (9700) since last fall.

“Art’s commitment and service as CIO strategically positioned Sandia to be a leader in effective and efficient information management,” Kim wrote.
Introducing Sandia’s FY2012-2016 Strategic Plan

(Continued from page 1)

The 20-page document provides more details on the Labs’ five strategic objectives:

1) Deliver with excellence on our commitments to the unique nuclear weapons mission;

2) Amplify our national security impact by enhancing the Lab’s role in preventing technological surprise and ensuring security challenges;

3) Lead the Complex as a model 21st-century Government-Owned Contractor-Operated national laboratory;

4) Excel in the practice of engineering; and

5) Commit to a learning, inclusive, and engaging environment for our people.

The Strategic Plan also shows how Sandia’s plans align with NNSA’s and DOE’s goals.

Paul writes in the introduction that for the plan to be truly meaningful, the objectives must translate into concrete actions that will move Sandia forward.

Center directors developed more specific goals, each objective. For example, under the fourth strategic objective — excel in the practice of engineering — one of the four goals is to implement a common engineering environment that enables technically creative work and promotes a disciplined approach to assure quality.

The Labs’ leaders will establish milestones that spell out specific actions against which they will measure the progress toward meeting these goals.

“While the objectives build from Sandia’s more than 60 years of exceptional service, they also respond to our dynamic and challenging external environment, which demands the highest level of performance for all institutions that support our nation’s security.”

Paul Hommerd, writing in the introduction to the FY2012-2016 Strategic Plan

Managers will host meetings for their staffs to better understand how individual work groups can help meet Sandia’s goals.

The plan is a living document that will be reviewed and modified to match the goals for current customers and future national security needs. Each summer, Sandia will publish multiyear goals and milestones for the upcoming fiscal year.

Sandia’s leaders will review these milestones quarterly and report annually to Lockheed Martin Corp., DOE, and NNSA on the Labs’ progress.

From the 2012-2016 Strategic Plan

Who we are, what we do . . .

Core Purpose

Rendering “exceptional service in the national interest” has been Sandia’s core purpose since 1949. The Labs’ original mission, to provide engineering design, systems engineering, and integration for the nonnuclear components of the nation’s nuclear weapons, continues today. The nuclear weapons mission is our reason for being; it is what makes us unique and it creates a foundation from which we leverage our capabilities and provide support to address other national security challenges.

Vision

On behalf of our nation, we anticipate and solve the most challenging problems that threaten security in the 21st century. When we achieve this vision, we are widely recognized as a national leader in preventing technological surprise, anticipating threats, and providing innovative, science-based system engineering solutions to our nation’s most challenging national security problems.

The excitement and importance of our work, our exemplary work environment, our partnerships with academia, industry, government, and other partners, and our record of historic contributions help us attract exceptional staff. Our employees are recognized by their professional peers for their outstanding contributions, and our laboratories are managed in a way that inspires confidence.

Mission

Our unique mission responsibilities in the nuclear weapons (NW) program create a foundation from which we leverage capabilities enabling us to solve complex national security problems. As a multidisciplinary national laboratory and Federally Funded Research and Development Center (FFRDC), Sandia accomplishes tasks that are integral to the mission and operation of our sponsoring agencies by:

• anticipating and resolving emerging national security challenges;

• innovating and discovering new technologies to strengthen the nation’s technical superiority;

• creating value through products and services that solve important national security challenges; and

• informing the national debate where technology policy is critical to preserving security and freedom throughout our world.

As an FFRDC for the National Nuclear Security Administration (NNSA), we have a long-term relationship with our sponsor. This creates an environment that supports maintenance of our fields of expertise, enables us to maintain our objectivity and independence, and allows us to have a familiarity with our sponsor’s mission.

We bring the FFRDC culture to all our federal sponsors to provide long-term support, solutions to existing problems and emerging threats, and quick-response capabilities. As an objective, independent, and trusted advisor, we draw from our deep science and engineering bases to anticipate, innovate, create, and inform the policy debate for decision-makers.

Values

Sandia has five core values, which are used to inform our daily decisions, shape our performance, and enable us to achieve success as one lab with one national security mission.

We serve the nation by responding to the requests of our customers and by anticipating our country’s critical national challenges; and

We deliver with excellence by meeting our commitments, hiring the best, working collaboratively, and committing ourselves to continuous improvement to advance the frontiers of science, engineering, and technology.

We respect each other by cherishing the intellect, skills, diversity, flexibility, and passion of our coworkers. We cultivate the development of all members of our workforce and commend our world-class accomplishments, which enable Sandia’s mission.

We act with integrity by living consistently within our principles, by telling the truth, and complying with the law.

We team for great results by sharing a common vision and by fostering an attitude of mutual respect with all our partners. We combine our talents to benefit each other and our customers, working to ensure that everyone gains from our collective achievements.

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‘Green Fire’ film: Sandia partners with the city of Albuquerque, Rio Grande Nature Center

By Susan Clair

Sandia’s Partnerships & Planning Dept. 4853 worked with representatives from the Rio Grande Nature Center State Park and the city of Albuquerque to offer a screening of the film Green Fire at the RGNC. More than 120 people attended this August event, including several members of the Sandia workforce. The film was shown in the nature center’s new, solar-powered education building.

Sandia purchased a screening license of Green Fire from the Aldo Leopold Foundation in April to show the film during the Labs’ 2011 Earth Day event. The screening license allows Sandia to show the film at other venues, in an effort to further disseminate the film’s message of land-use sustainability.

Aldo Leopold is perhaps best known as the author of the book, written as a collection of journal entries and essays, describes his “land ethic,” which he presents as the basis of a healthy relationship between people and the community of wildlife and vegetation living on the land.

Leopold’s experiences in New Mexico were instrumental in inspiring his land ethic philosophy. After graduating from the Yale Forest School in 1909, he accepted a short-term position with the US Forest Service as a ranger in the Sandia Mountains. He later transferred to the Canso National Forest in northern New Mexico, where he developed a greater understanding of caring for the land community. He worked with ranchers, teaching them about the importance of maintaining a balance of wildlife, including protecting and monitoring predators such as the wolf. Leopold was instrumental in securing official wilderness status to the Gila Wilderness in southeast New Mexico in June 1924. The Gila was the first officially designated wilderness area in the world.

Green Fire was produced through a partnership of the Aldo Leopold Foundation, the Center for Humans and Nature, and the US Forest Service. The film describes the evolution of Leopold’s idea of the land ethic, how it changed him, and how the idea has had a permanent impact on contemporary conservation projects around the world.

The Sand County Almanac. The book, written as a collection of journal entries and essays, describes his “land ethic,” which he presents as the basis of a healthy relationship between people and the community of wildlife and vegetation living on the land.

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10,000 ops

ACRR: A long history of accomplishment

- Annular Core Pulse Reactor: 1967-1977
- Initial criticality of the new Annular Core Research Reactor — April 1978
- First full-power (2 megawatts) ‘steady-state’ operation — July 1978
- First maximum power (29,000 megawatts) ‘pulse’ operation — August 1978
- First programmatic operations (nuclear fuels testing) — April 1979
- First university research experiment (UNM followed by New Mexico Tech in the same months) — May 1979
- First real-time neutron imaging experiment — June 1981
- Increase in maximum power (45,000 megawatts) ‘pulse’ operation — October 1981
- High Flux Neutron Radiography Facility — March 1991
- Testing of MT reactor controller — June 1991
- Development of diamond radiation detectors — June 1993
- Large computer wafers testing — July 1993
- Flowing laser experiment — October 1994
- First medical isotope experiment — December 1995
- Recommissioned for medical isotope production (molybdenum-99) — 1996-97
- Medical isotope activation production — March 2000
- Remote storage neutron monitoring system testing — July 2002
- Complete renovation of control systems — February 2003
- First Department of Homeland Security experiment — April 2004
- Experiment plan No. 1,000 issued — June 2005
- Satellite flight module testing — October 2006
- 10,000th operation — September 2011

Remembering 9/11

The three Labs directors of post-9/11 era share thoughts at commemorative event

C. Paul Robinson . . .

“We were really able to show that our talents could apply to much broader missions than we had done before. Truly, we became a national asset as viewed by even more people at that time. We had decided, with a conscious decision of strategic planning, that we had wanted to work on the development of counterterrorism tools. We had seen the rest of the world experience terrorism and we kept saying, ‘Okay, it’s going to come to our shores and we had better be ready for it.’ We had made a highest goal, which we had articulated in our strategic planning just a few years earlier, to become the laboratory the nation turns to for solutions to the most emerging problems that threaten our nation and the globe. Quite an undertaking, but we felt we had matured from being just a nuclear weapons lab to being a total national security laboratory.”

Tom Hunter . . .

“It’s a small group of operators through time; the one overriding characteristic of the operations group is their one wanted to be home . . . managing keeping people home turns out to be quite a big job. But let me put here a question: Why? Why here at Sandia did we see this competence and this commitment of our people? . . . The weapons program — and other programs over time — gave us people who shared two critical characteristics: competence and commitment. Commitment to the nation’s service. But facilities, infrastructure, sometimes even people, are not in and of themselves sufficient to cause the nation to turn to us after 9/11. [What we offered was] an environment of objective truth-telling, a selfless dedication to identity and deliver what’s really important to the nation. An environment where integrity is never exchanged for personal or corporate gain. . . . It’s because of who we are that the nation turned to us after 9/11. A whole new arena of customers sought us out, not because of what we could deliver — that was certainly true — but because they could count on us to tell it like it is.”

Paul Hommert . . .

“The three Labs directors of post-9/11 era shared the stage at the Steve Schiff Auditorium on Sept. 12 as part of a formal Labs observance of the 10th anniversary of the terrorist attacks that changed the nation’s ideas about national security. C. Paul Robinson, Tom Hunter, and Paul Hommert discussed 9/11, its impact on Sandia, and how the Labs can continue to serve the nation in the years ahead. Here are brief excerpts from their comments (presented in the order in which they spoke):

C. Paul Robinson . . .

“We were really able to show that our talents could apply to much broader missions than we had done before. Truly, we became a national asset as viewed by even more people at that time. We had decided, with a conscious decision of strategic planning, that we had wanted to work on the development of counterterrorism tools. We had seen the rest of the world experience terrorism and we kept saying, ‘Okay, it’s going to come to our shores and we had better be ready for it.’ We had made a highest goal, which we had articulated in our strategic planning just a few years earlier, to become the laboratory the nation turns to for solutions to the most emerging problems that threaten our nation and the globe. Quite an undertaking, but we felt we had matured from being just a nuclear weapons lab to being a total national security laboratory.”

Tom Hunter . . .

“It’s a small group of operators through time; the one overriding characteristic of the operations group is their...
In the short six weeks I spent working at Sandia, I was presented with an incredible opportunity to learn about the history of Sandia as well as its current role in national security and technological development. I had the privilege of taking tours of most of the on-site facilities showcasing current projects and was able to attend seminars and talk to experts about current issues facing the United States. As a future Coast Guard officer, this assignment to me in the field of homeland security hit close to home, serving as an eye-opener of the real threats that face our country. Preparing for a career in the military, I hope to look back on this experience as a positive one, knowing that some of the brightest minds in America are here at Sandia and the other labs are constantly working on new technologies to keep our nation ahead.

Chris Monacelli

The six weeks I spent working at Sandia were an experience like no other. This was a time for me to really expand my knowledge in numerous fields of study. I think I have learned just as much in six weeks here as I have in three years at the academy. I don’t think I will ever get the chance to work with and learn from so many bright minds in a single place anytime soon. Professionally, I think this internship has prepared me for a career outside the Coast Guard. It has helped me get one step further in my Coast Guard career because I have worked with the personnel who train Coast Guard aircraft inspectors. Overall, the experience I got at Sandia is one that I will never forget.

Brian Gracey

My time at Sandia went by way too fast. The six weeks at the laboratory were the most exciting, rewarding, and creative weeks of my engineering career. Under the guidance of David Nick and Dan Small (both 6533), I worked on the HexaCopter, a remote-controlled, six-rotor copter with surveillance and autonomous capabilities. Through this work, I expanded my knowledge of SolidWorks and learned a lot about rapid prototyping and concept development, skills that will certainly help me in my future. Sandians are a truly unique breed and I am proud to say I worked alongside so many intelligent and truly awesome people. The amount of respect and teamwork displayed on a daily basis was inspiring. I look forward to working with Sandians in the future as a Coast Guard officer. My confidence about my summer experience at Sandia is that it had to come to an end. However, my engineering experiences at Sandia have made me excited about my career and ready to return to the US Coast Guard Academy for my senior year. Thank you to all those at Sandia for providing me with a unforgettable summer experience.

Thomas John Kane

My time at Sandia has been an experience that helped me grow as a person and as an engineer. Being accustomed to the military environment of the Coast Guard, seeing how an elite research facility operates has helped me learn about how true scientific research is being done. I worked with a research group on finding new materials for high-capacity batteries. I learned a ton about batteries and battery science, a subject in which I had little prior knowledge. I think there are few places in America where you can find as many smart, dedicated people as you do at Sandia. Being in that environment alone was a very rewarding experience. I know that the resources I gained both personally and professionally during my time at Sandia will give me a tremendous advantage as my peers and I move into our senior year at the academy.

Wryan Webb

Working at Sandia this summer was a very rewarding six weeks. I was attached to Center 2600, working with Sandians in their efforts to monitor and evaluate the integrity of StrongLinks. The experience was somewhat challenging, as the world of Stronglinks is an intense one. Gaining the general level of competence to even participate in an intelligent conversation took some time. However, since then, I had the opportunity to work with and learn from many incredible people, which has been beneficial, both in terms of professional development and in the personal relationships I’ve established with many impressive Sandians. This short-term internship program has been one of the most worthwhile uses of summer I’ve ever had and I will definitely be recommending it to other cadets back at the US Coast Guard Academy.

It may seem an unlikely collaboration: a desert-based national laboratory hosting cadets from the United States Coast Guard Academy (USCGA). But look a little deeper and a common theme emerges: The US Coast Guard is the world’s oldest lifesaving organization; it has a long and proud tradition of keeping America safe. And so does Sandia. Along with similar goals of service to the nation, the institutions share a common engineering foundation: The USCGA curriculum is largely engineering-centric and Sandia is the nation’s largest engineering laboratory. With these common interests in mind, in 2005 Sandia launched a summer internship program to bring USCGA cadets to the Labs to work on science and engineering projects. This past summer, six USCGA cadets participated in the program at Sandia, including one cadet who worked at Sandia/California, a first in the history of the six-year partnership. The projects are anything but make-work; they are challenging, relevant, real-world, hands-on projects designed to stretch the skills and increase the knowledge of the USCGA cadets. The program, matching the students with Sandia researchers, encourages a mentoring relationship that enhances the cadets’ technical and professional growth.

The NNSA-sponsored Military Academies Collaboration (MAC) program, coordinated by Staci Donsey (0215) and Sarah Low (8529), has been such a success with the USCGA that plans are now in the works to partner with the nation’s other military academies. Coordination efforts are currently underway with NNSA, Lawrence Livermore National Laboratory and Los Alamos National Laboratory to bring in cadets from all the military academies to the three laboratories for internship positions in the summer of 2012. A Sandia Daily News notice will be issued in December to solicit projects for the summer 2012 MAC Internship Program.

This year’s summer interns were cadets Andrew Breen, Christopher Monacelli, Thomas Kane, Wryan Webb, Brian Gracey, and Alexander Lloyd (Sandia/California). The cadets, selected for the internship by the USCGA based on their academic performance and leadership skills, spent the first half of the summer on a Coast Guard boat assignment and the remaining six weeks at Sandia laboratories.

This year, the six interns worked on six different projects across multiple strategic management units and divisions, including:
- The DARPA Autonomous Robotic Manipulation Hardware program — Curt Salisbury (6533), mentor
- Study in New Materials for High-Capacity Batteries — Timothy Lambert (6124), mentor
- Alaska Red Team Threat Assessment — Tim Tooman (8123), mentor
- Non-Destructive Inspection Testing — Dennis Roach and Mike Bode (6620), mentors
- StrongLinks Project, Melissa Martinez (2616), mentor
- HexaCopter UAV Project — Dan Small and Dave Novick (6533), mentors

Shortly before heading back to New London, Conn., to resume their academy life, the six cadet interns shared their thoughts with the Lab News about their summer experience at Sandia. Here are their comments:

Andrew Breen

I really enjoyed my time at Sandia. I had the pleasure of working with Curt Salisbury (6533) on the DARPA Autonomous Robotic Manipulation project. My task was to design a data glove to control a robotic hand, a task that had its challenges, but has been rewarding. During the six weeks I spent at the Labs, I was very grateful to Sandia for the opportunity to work with and around so many smart people, not only giving me hands-on experience in engineering and design, but also an appreciation for how different government agencies, like the Coast Guard and Sandia, can interact to benefit mission readiness. My time at Sandia is something I certainly will not forget, and I am excited to take the experience and knowledge I have gained here into my Coast Guard career.

Alexander Lloyd

In the short six weeks I spent working at Sandia, I was presented with an incredible opportunity to learn about the history of Sandia as well as its current role in national security and technological development. I had the privilege of taking tours of most of the on-site facilities showcasing current projects and was able to attend seminars and talk to experts about current issues facing the United States. As a future Coast Guard officer, this assignment to me in the field of homeland security hit close to home, serving as an eye-opener of the real threats that face our country. Preparing for a career in the military, I hope to look back on this experience as a positive one, knowing that some of the brightest minds in America are here at Sandia and the other labs are constantly working on new technologies to keep our nation ahead.

Chris Monacelli

The six weeks I spent working at Sandia were an experience like no other. This was a time for me to really expand my knowledge in numerous fields of study. I think I have learned just as much in six weeks here as I have in three years at the academy. I don’t think I will ever get the chance to work with and learn from so many bright minds in a single place anytime soon. Professionally, I think this internship has prepared me for a career outside the Coast Guard. It has helped me get one step further in my Coast Guard career because I have worked with the personnel who train Coast Guard aircraft inspectors. Overall, the experience I got at Sandia is one that I will never forget.

Brian Gracey

My time at Sandia went by way too fast. The six weeks at the laboratory were the most exciting, rewarding, and creative weeks of my engineering career. Under the guidance of David Nick and Dan Small (both 6533), I worked on the HexaCopter, a remote-controlled, six-rotor copter with surveillance and autonomous capabilities. Through this work, I expanded my knowledge of SolidWorks and learned a lot about rapid prototyping and concept development, skills that will certainly help me in my future. Sandians are a truly unique breed and I am proud to

US COAST GUARD cadet interns with mentors and program coordinators at Sandia.
It's been an electric summer at Sandia.

A flurry of projects related to renewable energy adoption and power grid modernization have been going on at Sandia and on the campus of Sandia’s partner, the University of Vermont (UVM).

Nine UVM students and eight faculty members spent the summer at Sandia through a DOE-sponsored Electric Power Fellowship Program. The students worked with Sandia researchers on a variety of projects related to the challenges of integrating plug-in hybrid electric vehicles (PHEV). Their projects ranged from deep technical work on hardware robustness to complex cultural and behavioral analysis.

By Stephanie Holinka

Garage biology buff brings global perspective to bio-challenge

By René Deger

Power forward

Electric Power Fellowship students and faculty work on solutions to our future energy challenges

By Roberto Degen

Students projects

Below is a brief summary of the Electric Power Fellowship final projects. The students presented their work both at a technical talk at Sandia/New Mexico and at a special presentation for VP Rick Stulen at Sandia.

Eduardo Cotilla-Sanchez, a doctoral student in electrical engineering and electromagnetics, and his partner, Chris Parmter, helped develop a power grid model that will allow researchers to better understand how cascading failures propagate through a grid, and how grid stability breaks down during blackouts.

Shaun Faletra, another student and research partner, undergraduate engineering student Francesca Minervini, examined some possible effects of the increased evening PHEV charging in residential neighborhoods. Zhang and Minervini's model demonstrates the increased transient heat dissipation under-ground cables into the soil that will result from the new peak loads.

Recent graduate Andrew Seier worked with Tony Lentini (1727) and UVM professor Jeff Frolk, examining possible communications requirements for smart grids, considering them as a system of scalable microgrids.

Electrical engineering doctoral candidate Chris Palombini analyzed power line communications for microgrid stability and PHEV balancing. His work supports the LDRD Grand Challenge on Secure, Scalable Microgrids and the LDRD for plug-in hybrid electric vehicles.

Engineering mechanical undergraduate Melissa Jeleza and Nate Palmer worked on a behavioral model that displays how social influence through online networks can change opinions and has the potential to influence PHEV implementation to propagate. Their work looked at ways that social influence through online social networks could be used to aid in sharing information about PHEVs.

Brad Lanute, a graduate student beginning his second year of a master’s in economics and modeling, worked with Kitan Lakkaraju (1462) on a cognitive modeling project evaluating whether Amazon's Mechanical Turk (AMT) crowd-sourcing web service could be used by researchers to collect data on consumer preferences related to car purchases.

ROB CARLSON in his garage-based bio-lab in 2006. (Photo courtesy of Rub Carlson)

Carlson's message echoed some of the same points Sandia researchers have also held technical talks at universities and industrial research facilities, and more are ongoing. More energy-related UVM activities expand and how these individuals view their work both at a technical talk at Sandia/New Mexico and at a special presentation for VP Rick Stulen at Sandia.

Carlson came to Sandia earlier this month as part of the Bioscience/Material Science Education Program, which was created in 2002 to support scientists and program specialists with strategic educational opportunities. A Princeton University-trained physicist, Carlson worked with noted biologist Sydney Brenner at the Molecular Sciences Institute in Berkeley, Calif. His experience there and his subsequent experiment setting up a microbiology lab in his own garage were chronicled in an October 2010 article in Nature called Biohacker.

That article explored how garage-based biology was taking shape and communities of hobbyists were forming in several countries, a trend that some basic (Continued on next page)
A key to developing strong cyberdefenses is having a realistic picture of the threats, said Ann Campbell, senior manager for Cyber Research (1950). She remarked that people typically think of cyberdefenses in terms of firewalls and antivirus software, but in reality, sophisticated adversaries are more devious. They may introduce malicious elements into the supply chain to help them later on in their operation, which requires a closer connection to national security. They may weaken an information system by degrading its performance or availability.

The adversary certainly has the advantage,” continued Campbell. “It chooses the time, place, and method of attacking a system, whereas the defender needs to be successful all the time.”

To better the defender’s odds, “The nation needs to be able to find ways to shield threat information without compromising sensitive information,” Arnn told the audience.

A cybersecurity curriculum may include, he said, computer science theory, principles and practice; security theory; STEM (science, technology, engineering, and mathematics) education; game theory, laws, regulations, compliance, privacy, history, successes, and failures.

“In a world of overwhelming complexity, with incomprehensible advances happening in every branch of computation every month, how do we train an cadre’?” he said. “What we don’t want [for students] are toy problems with toy solutions. We want researchers to be inspired by real problems so they can develop real solutions.”

A related security problem is that statistics show students enrolled in cyber courses has been stagnant. One way to solve that problem, and at the same time come up with radical security innovations, suggested the NSF’s Carl Landwehr, could lie through the historically effective method of prize competitions.

“Evidences shows,” he said, “that a well-formed public competition can trigger innovation.”

Landwehr highlighted the limited progress to date in building appropriate cyberdefenses for large-scale computer systems. “I’ve been working on this problem for 40 years, and all I’ve seen are Band-Aids,” he said.

He provided a list of historical examples — one dating back to a 15th-century design competition for a cathedral dome in Florence, Italy — to show how public competitions have led to significant public involve ment, accompanied by technological breakthroughs. A cybersecurity design competition with a particular target, prize, and completion date, he said, could not only lead to radical technical solutions, but also help reinvigorate the research community and attract students to a field facing chronic talent shortages.

One reason for tepid student interest is that the biggest societal rewards lie in coming up with imaginative, money-making programs, rather than functioning successfully all the time. “For 40 years, and all I’ve seen are Band-Aids,” he said. Then he provided a list of historical examples — one dating back to a 15th-century design competition for a cathedral dome in Florence, Italy — to show how public competitions have led to significant public involvement, accompanied by technological breakthroughs. A cybersecurity design competition with a particular target, prize, and completion date, he said, could not only lead to radical technical solutions, but also help reinvigorate the research community and attract students to a field facing chronic talent shortages.

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In recent tests of the Navy’s Tomahawk cruise missile, performance has been remarkably successful — and so has the performance of Sandians and instrumentation systems at Tonopah Test Range, where the missile’s performance was verified.

TEST SECTION of Sandia’s new shock tunnel is checked by Manuel Vigil (9322), project engineer for the facility.

Mileposts

New Mexico photos by Michelle Fleming

Laurie Phillips 30 5628
Barry Ritchey 30 2555
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Suzette Beck 25 850
Tom Brown 25 5353
Dale Dubbert 25 5345

John Eldridge 25 5632
Linda Hall 25 4848
Gene Hertell 25 5417
Sheryl Hingorani 25 250
Kent Meeks 25 2130
Lorea Mendosa 25 10615
Marion Scott 25 2300

Kent Meeks 15 6614
Anthony Salazar 15 9513
Daniel Savignon 15 1732

This month in the past

50 years ago . . . A striking similarity between aluminum “honeycomb” and sea water has led to an economical and time-saving technique for testing nuclear weapon instrumentation systems at Livermore Laboratory. Until recently it was almost impossible to guarantee that instruments recording flight tests would survive when a missile hit water. Now, however, it is possible to test the instruments in advance by attaching them to the rear of a block of pre-shaped honeycomb and firing a projectile at it. The honeycomb acts as a shock absorber, soaking up the blow and relaxing it to the instruments in the same way water would. Early tests revealed that honeycomb crushes at a constant rate when struck by the air gun projectile, regardless of the speed at which the projectile was fired. Further tests show that an object attached to the rear of the honeycomb would receive a smooth transfer of energy, much the same as that experienced by a missile hitting water.

40 years ago . . . First-flow calibration tests were successfully conducted recently to check out Sandia’s new 305-foot-long shock tunnel in Coyote Test Field. The shock tunnel is the largest explosive-driven blast facility in this country capable of generating supersonic flow at mach numbers at the muzzle end. It will be used to subject instrumented full-size test units suspended in the test section to shocks and overpressures created by the detonation of explosive charges in the driver section at the other end. The new tunnel is Sandia’s fourth explosive-driven shock tube facility in Coyote Test Field.

TARGET for air gun water entry tests is missile warhead instrumentation attached behind a block of aluminum honeycomb. (Inset shows comb after test.)

TEST SECTION of Sandia’s new shock tunnel is checked by Manuel Vigil (9322), project engineer for the facility.

Sandians and instrumentation systems at Tonopah Test Range, where the missile’s performance was verified.

TARGET for air gun water entry tests is missile warhead instrumentation attached behind a block of aluminum honeycomb.

TEST SECTION of Sandia’s new shock tunnel is checked by Manuel Vigil (9322), project engineer for the facility.
By Iris Aboytes

Bonnie Apodaca, director of Business Management Operations Center 10600, and Becky Krauss, Div. 11000 VP and General Counsel, are profiled in the current issues of Profiles in Diversity Journal. Becky is profiled in the 10th Annual Women Worth Watching special issue and Bonnie is profiled in the Hispanic Heritage Month issue.

Bonnie’s philosophy is that for every situation there is a right leader. “You grow as a leader by finding the right approach for each situation,” says Bonnie. I’m on a continual journey to understand what approach to take for various situations. You can learn something from every person you come in contact with. Leadership is not a one-person act. Becky believes in calling attention to yourself in a respectful way. “Make your mark in a positive way that distinguishes you from your co-workers and fits within your culture. I watched, listened, and learned a different communication style that allowed my voice to be heard and my impact recognized.”

Bonnie says her one of her most rewarding accomplishments is leading a team of business professionals in a research and development environment. “We have realized our business support into one organization,” she says. “This was not a popular idea. In this role, I am a change agent in an environment where change was not well-accepted. “It’s been rewarding because it has required communicating with many people and building trust, relying more on leadership and teaming than on any specific technical knowledge or skills.”

Jessica Pascual receives personal achievement award

By Iris Aboytes

Jessica Pascual (3510) was selected as the 2011 Pamana awardee for Personal Achievement by the Filipino American National Historical Society – Rio Grande Chapter (FANHS-RG) at ceremonies held Sept. 3 at the MCM Elegante Hotel in Albuquerque during the Pamana Heritage Awards Night. The FANHS-RG sponsors this event to recognize the achievements and contributions of Filipino Americans in the community. The Personal Achievement Award is given to a Filipino American who has attained success in his or her chosen profession, field, or specialty and has inspired others to overcome obstacles and make sacrifices to achieve their goals.

Jessica joined the Laboratories in July 2009 and is currently deputy director for Human Resources. She manages and oversees the Human Resource Operations (HR) function and leads the TotalComp project. Before coming to Sandia, Jessica worked at Los Alamos National Laboratory (LANL) for more than six years. She also worked for McAfee Inc. as a global compensation and benefits manager.

Jessica’s team was successful in designing and implementing a market-based job classification system at LANL, the Compensation Program Design project that allowed the laboratory to better meet a wide range of strategic recruitment and retention needs. It provided its employees with visible career paths and a fair and consistent salary progression framework aligned to external market and internal equity.

Jessica received a bachelor’s degree in business administration from Assumption College in Manila, Philippines. She is a member and is a certified compensation professional of WorldatWork, a not-for-profit organization providing education, conferences, and research focused on global human resources issues, including compensation, benefits, work-life, and integrated total rewards to attract, motivate, and retain a talented workforce.

Jessica was born in Manila. Her late father, Jesus Cabaliza, had several businesses: taxicabs, restaurants, and movie production.

“I remember reading meters for each taxi and collecting money from the taxi drivers,” says Jessica. Her mother, Araceli Nolasco, was a nurse and is now a retired businesswoman.

Jessica’s first job was working in the production of the Soame Street TV series. She was also a fashion model in Manila.

Jessica is married to Leonard Pascual and together they have two sons, Leland who attends New Mexico Tech, and Lorenzo, a junior at St. Michael’s High School.

“Make your mark in a positive way that distinguishes you from your co-workers and fits within your culture.”

— Becky Krauss