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Innovators honored
Greg Nielsen could have been annoyed by a caller who telephoned him by mistake, thinking he was a different former Truman Fellow, but instead Greg engaged the man in conversation, and a collaboration was born. See page 9.

Train of Lights
On a recent Friday evening, Sandia retiree Dick Jones was at the Sunol, Calif., depot of the Niles Canyon Railway with Juliette Goodrich, a television news anchor, signing copies of their new children’s book, Train of Lights. Read about it on page 3.

World’s smallest battery created at CINT nanotechnology center
Snake-like ‘Medusa front’ offers ‘a view never before seen’ to improve lithium batteries

By Neal Singer

A benchtop version of the world’s smallest battery — its anode a single nanowire one-seven-thousandth the thickness of a human hair — has been created by a team led by Jianyu Huang (1132).

To better study the anode’s characteristics, the tiny rechargeable, lithium-based battery was formed inside a transmission electron microscope (TEM) at the Center for Integrated Nanotechnologies (CINT), a DOE research facility jointly operated by Sandia and Los Alamos National Laboratories.

Says Jianyu of the work, reported in the Dec. 10 Science, “This experiment enabled us to study the charging and discharging of a nanobattery in real time and at atomic-scale resolution, thus enlarging our understanding of the fundamental mechanisms by which batteries work.”

Because nanowire-based materials in lithium ion batteries offer the potential for significant improvements over bulk electrodes in power and energy density, more stringent investigations of their operating properties should improve new generations of plug-in hybrid electric vehicles, laptops, and cell phones.

“What motivated our work,” says Jianyu, “is that lithium ion batteries (LIB) have very important applications, and storing energy is extremely important to our future.”

(Continued on page 4)

Paul Hommert All-Hands
Introducing new leadership and looking to Labs’ future

Sandia President and Labs Director Paul Hommert hosted an all-hands gathering in the Steve Schiff Auditorium on Monday, Dec. 6, covering a range of topics from a strategic issues update, cost austerity efforts at the Labs, the recent retiree policy changes, and a question-and-answer dialog with members of the workforce. However, first on Paul’s agenda was the introduction of the incoming Deputy Labs Director and Executive VP for Mission Support Kim Sawyer.

“I’ve actually admired Sandia from afar for a long time,” Kim (0003) said. “I never imagined I would have the honor to be here, but sometimes dreams do come true.”

Kim described for the audience her diverse professional background, holding leadership and technical positions at Lawrence Livermore National Laboratory, Boeing, and Battelle.

(Continued on page 5)

By Darrick Hurst

After more than 30 years at the Labs, Executive VP Al Romig is headed to Lockheed Martin’s legendary Skunk Works. Read about Al — and what his friends have to say about him — in a story beginning on page 6.

AS THE YEAR WINDS DOWN, sandhill cranes soar above Bosque del Apache. The return of the cranes to New Mexico each year coincides with the beginning of the holiday season. (Photo by Randy Montoya)
That's that

Light bulbs — the incandescent kind — are a disposable commodity item with built-in obsolescence. They burn for their allotted 700 hours or whatever and then die, just as they are designed to. But it doesn't have to be that way. Over the next page Patti Koning offers a story about Sandia retirees and photographer Dick Jones. Since his retirement, Dick has collaborated with a local television reporter on a couple of children's books. One tells the story about the incredible bulb in a Livermore, Calif., fire station that has been burning almost continuously since it was turned on back at the dawn of the century. The last little bulb that could — it’s only typical Sandia fashion — to do something. Instead of exchanging Christmas gifts ago, several Sandians who were aware of this persistent problem decided — in a typical Sandia fashion — to do something. Instead of exchanging Christmas gifts of the office that year, they pooled their money to buy shoes for kids. And thus was born the program that in the intervening 54 years has provided shoes to more than 12,000 deserving school children. There are so many worthy giving opportunities out there — and Sandians give generously in so many ways — that it might seem a bit arbitrary to single out Shoes for Kids for special mention here. But Shoes for Kids is a homegrown effort, Sandia born and bred; to me that counts for something. It’s a tradition at Sandia that gets better and better every year, and a good one. And to the kids. Are we changing the world one pair of shoes at a time? I don’t know about that. But I do give so generously in so many ways — that it might seem a bit arbitrary to single it out — you can donate via Sandia Laboratories Federal Credit Union at account number 223180, 90-01 lastname-shoes. . . .

Finally, happy holidays to all of you, our faithful readers; may your days be merry and bright.

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

Employee death

Bob Turman will be remembered for his absolute devotion to our nation’s security

Bob Turman (5440) died on Nov. 29. He was 66 years old and had been at Sandia 30 years. Bob was deputy director and program manager for Directed Energy Systems in Integrated Military Systems Development Center 5400. He was responsible for research and development of a broad range of applications for military and civilian uses of directed energy. He managed program funding of approximately $30 million.

"Bob was a vision- ary," says Sandia retiree Ken Prestwich. "He was a dreamer and an urgent response team. The team was charged with developing an emergency capability for processing District of Columbia mail, and he spearheaded an implementation strategy to safeguard the mail nationwide against future anthrax attacks. Many projects here stopped in October 2001 as he pulled together the Sandian team to support DOEs in the national response to the anthrax attacks. I was fortunate to have served on Bob’s team that supported that national task force. While working at the field sites, it was reassuring to hear Bob’s strong voice and technical leadership at the multi-agency telecons to Washington. When we had challenges in the field, I remember his careful listening, recommendations, and directive, ‘Make it happen.’ The national team developed the process, and the mail got delivered safely. Bob and his team won a 2002 Lockheed Martin NOVA award for the week. "Bob fostered relationships with the DoD RD&O organizations," Ron continues. "His message was clear: ‘How can we work with them and help them succeed with their initiatives?’"

Bob loved gadgets, Ron says. On a trip to Arlington, Va., he and Bob bought a GPS device for their car. “I also had a paper map, recalls Ron. “The traffic was bad, but Bob knows the shortcut on the small residential streets. Uh oh, school guards, school buses, garbage trucks, but we’re not any closer to our destination. It’s time to get the GPS out. Don’t need a paper map. Now there are three of us in the car: Bob, me, and the lady inside the GPS. After four bad turns, he stuffed the lady in the GPS back in the bag, and said, ‘Where’s the map?’ “It was typical Bob; he was stressed but not angry. We had just shared a comical adventure. It was funny. "The way he handled that little adventure was the way Bob handled his projects. When things didn’t work, he always found a positive aspect. “We arrived at our meeting in laughter. We had just shared a comical adventure. It was funny. "The way he handled that little adventure was the way Bob handled his projects. When things didn’t work, he always found a positive aspect. “We arrived at our meeting in laughter. We had just shared a comical adventure. It was funny."
In retirement, Dick Jones creates children's books

By Patti Koning

O n a recent Friday afternoon, Sandia retiree Dick Jones was at the Sunol, Calif., depot of the Niles Canyon Railway with Juliette Goodrich, a television news anchor, signing copies of their new children’s book, Train of Lights. “This is not something I ever expected to do,” Dick says. “But some of the best things in my life were unexpected.”

Train of Lights celebrates the Niles Canyon Railway’s annual holiday train. From Thanksgiving through Christmas week each year, the historic rail’s Bay Area landmarks in children’s literature? To find the answer, you have to look back 40 years, when Dick first became a photographer.

He joined the Air Force in 1969, a year after graduating from high school, but stayed on the ground, chasing IAF in England. He finally got off the ground after leaving the Air Force, when the GI Bill enabled him to attend flight school.

“I went through private, commercial, instrument, and multi-engine flight school. I decided I didn’t want to be a captain and form the Copilot A to point B — I was already a better engineer, so why would I pay for a very expensive airplane just to fly around?” Dick explains. “So I returned to work on the Atmospheric Radiation Measurement (ARM) where, among other tasks, he took aerial photographs of ranches and houses. I was going door to door and selling pictures, but it took up a lot of time.”

That all changed when Taro Bell asked Dick to take photographs of all of their sites. “I flew for them for over 20 years,” he recalls. “They wanted north, south, east, west, and overhead.”

He began working for other fast food chains and for commercial real estate companies, providing photographs to help scout locations. Dick was already working at Sandia — with an associate’s degree in mechanical engineering, he hired in as a technician but quickly moved to design. “This was something I could do while working at Sandia, because it was all on the weekends,” he says. “I never really made any money at it. I earned enough to cover the plane rental and invest in new equipment.”

Over the next 30 years, Dick continued to fly and photograph on the weekends. Then in 2001, Barry Schrader, Sandia/California’s public relations officer at the time, told him about Livermore’s famous light bulb, which was nearing 100 years of continuous illumination. “That captured my attention. I went to the fire house, got on a ladder, and took pictures of the bulb,” Dick recalls.

After seeing those photos, Sandia drafterman Steve Bunn (now retired) made a website for the bulb. Dick and Barry helped form the Centennial Light Bulb Committee with Steve, Sandia technician Tim Sage (also retired), Lawrence Livermore National Laboratory public relations officer Scott Green, and Stewart Gary, Tom Bramell, and Lynn Owens of the Livermore-
THE MEDUSA TWIST: a formerly unobserved increase in length and twist of the anode in a nanobattery.

at a forest to try to understand the behavior of an ally — a process, Jianyu says, that resembles "looking in-situ TEM could bring new insights to the natural world."

how to catch a nanowire (the empty holder, above, demonstrates the procedure) — a mass of nanowires would be glued to the tip of the sword-like shape at the right-center of the device. The STM selector-tip, here represented by a silver-colored metal wire touching the tip of the sword-like holder, can be manipulated forward or backward by shrinking or expanding the far-left cylinder via the piezoelectric effect. The hat with six-pronged device (resembling a sideways octopus) clamped to the metal ball holds the STM tip steady. The right-hand side of the device holds electrical wiring.

Battery research groups around the world use nano-materials as anodes, but in bulk rather than individually — a process, Jianyu says, that resembles "looking at a forest to try to understand the behavior of an individual tree."

Observing change in atomic structure

The Sandia-led design consists of a single tin oxide nanowire and a metallic nanowire 100 nanometers in diameter and 10 micrometers long, a bulk lithium cobalt oxide cathode three millimeters long, and an ionic liquid electrolyte. The device offers the ability to directly observe change in atomic structure during charging and discharging of the individual "trees."

An unexpected find of the researchers was that the tin oxide nanowire rod nearly doubles in length during charging — far more than its diameter increases — a fact that could help avoid short circuits that shorten battery life. "Manufacturers should take account of this elongation in their battery design," Jianyu says. (The common belief of workers in the field had been that batteries swell across their diameter, not longitudinally.)

Jianyu's group found this behavior by following the progression of the lithium ions as they travel along the nanowire and create what researchers christened the "Medusa front" — an area where the high density of mobile dislocations causes the nanowire to bend and wiggle as the front progresses. The web of dislocations is caused by lithium penetration of the crystalline lattice.

"These observations also prove that nanowires can sustain large stress — greater than 10 GPa [gigapascals] — induced by lithiation, indicating that lithiation without nanowires are very good candidates for battery elec-

trodes," says Jianyu.

Still, the researchers were surprised to see the lengthening dislocations and the dislocations. Says Jianyu, "No one had ever seen either before. But our observations tell battery researchers how they are generated, how they evolve during charging, and offer guidance in how to mitigate them."


Lithiation-induced volume expansion, plasticity, and pulverization of electrode materials are the major mechanical defects that plague the performance and lifetime of high-capacity anodes in lithium-ion batteries, Jianyu says. "So our observations of structural kinetics and amorphization [the change from normal crystalline structure] have important implications for high-energy battery design and in mitigating battery failure."

The electronic noise level generated from the reference measurement system was too high to read electrical currents, but co-author John Sullivan (1132) estimated a current level of a picampere flowing in the nanowire during charging — a level so low that the nanowire was charged to a potential of about 3.5 volts, Jianyu says.

A picampere is a millionth of a microampere. A microampere is a millionth of an ampere.

Functioning in a vacuum environment

The reason that atomic-scale examination of the charging and discharging process of a nanowire had not been possible was because the high vacuum in a TEM made it difficult to use a liquid electrolyte. Part of the Huang group's achievement was to demonstrate that a low-vapor-pressure ionic liquid — essentially, molten salt — could function in the vacuum environment. Although the work was carried out using tin oxide (SnO2) nanowires, the experiments can be extended to other materials systems, either for cathode or anode studies, Jianyu says.

"Our experiments lay a foundation for in-situ studies of electrochemical reactions, and will have broad impact in energy storage, corrosion, depolarization, and general chemical synthesis research field as well," he predicts.

Other researchers contributing to this work include Xiao Hua Liu, Nicholas Hudak, Arunikumar Subramanian (all 1132), and Hongyou Fan (1813). Li Zheng, Scott Mao, and Li Qiang Zhang of the University of Pittsburgh; Chong Min Wang and Wu Xu of Pacific Northwest National Laboratory; and David Kushner, and Ju Li of the University of Pennsylvania. Funding came from Sandia's Laboratory Directed Research and Development Office and DOE's Office of Science through CINT and the Energy Frontier Research Centers program.

Sandia researchers awarded more than 65 million supercomputing simulation hours by DOE INCITE program

By Mike Janes

Two projects led by researchers at Sandia's Combustion Research Facility (CRF) and Computer Sciences and Information Systems Center have been awarded 65 million hours on two DOE supercomputers through DOE's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program. The research projects utilize two world-leading supercomputers with a computational capacity roughly equal to 135,000 quad-core laptops.

"The Department of Energy's supercomputers provide an enormous competitive advantage for research. United States," Energy Secretary Steven Chu said when the awards were announced. "This is a great example of how investments in innovation can help lead the way to new industries, new jobs, and new opportunities for America to succeed in the global marketplace."

Awarded on a competitive basis, many of the new and continuing INCITE projects aim to further renewable energy solutions and advance understanding of the environmental impacts of energy use. The program, open to all scientists, is supported by DOE's Office of Science and managed by the DOE Leadership Computing Facilities at Argonne and Oak Ridge National laboratories, which host some of the world's fastest supercomputers.

INCITE projects could help speed the development of more efficient solar cells, lead to improvements in biofuel production, and help identify more effective medications to slow the progression of Parkinson's disease.

This year's INCITE awards are the largest-ever awards of the department's supercomputing time. A total of 1.7 billion processor hours were granted to 57 innovative research projects that will use computer simulations to perform virtual experiments that in most cases would be impossible or impractical in the natural world.

Joe Oefelein (8351) is the principal investigator on "High-Fidelity Simulations for Advanced Engine Combustion Research," with his colleague, Jackie Chen (also 8351), serving as co-investigator. Joe and Jackie were awarded more than 25 million hours on the Cray X5S ("Jaguar") machine at Oak Ridge National Laboratory. Their project aims to provide new insights into the dynamics of turbulent combustion processes in internal combustion engines, and to maximize the collective benefits of those insights through collaborations among the researchers involved.

David Evernks (8966) is principal investigator for "Trace Collection for Simulation-Driven Co-design of Exascale Platforms and Codes," Curtis Jansen (8953) serves as co-investigator. The project was awarded 5 million hours on the IBM Blue Gene/p ("Intrepid") machine. Their project focuses on "exascale" computing and is the validation part of a larger effort to help researchers design applications, runtime, and systems for future exascale computing, considered the next great leap in size for computers.

A third Sandia researcher, Mark Taylor (1442), is participating in two other proposals that were granted 110 million and 35 million hours. Mark is a co-investigator on "Climate-Science Computational Design and Applications," and Liang Qi is principal investigator on "Climate End Station II," led by the National Center for Atmospheric Research, and on "Numerical Study of Multiscale Coupling in Low-Aspect Ratio Rotating Stratified Turbulence," led by Les Alamos National Laboratory.
Paul Hommert all-hands meeting

(Continued from page 1)

roles in a career that has spanned more than 30 years across multiple companies and corporations, with responsibilities in leading organizational changes and business process improvements.

In her new role, Kim is responsible for enabling mission success and leading organizational changes and business process improvements.

In his address to the workforce, Paul provided an update on the on-going efforts around Sandia’s TotalComp project, the initiative that is examining the Labs’ entire system of performance and compensation.

“If we’re going to make a change that affects everyone in the laboratory, I will talk it through first, in front of you. If I can’t explain it and be comfortable with the ‘why’ and explain it if with conviction and passion for why we’re doing it, then we won’t do it.”

— Paul Hommert on TotalComp

“This is a topic that is going to touch everyone,” Paul said. “In my view, change is necessary here. . . . My commitment is that by the middle of January we will have made a decision on how to move forward.”

Paul explained the changes were motivated by two factors that employees could expect a dialogue session in early 2011 that will be dedicated to discussing the decision will be in regard to the implementation of a new TotalComp system.

“If we’re going to make a change that affects everyone in the laboratory, I will talk it through first, in front of you,” he said. “If I can’t explain it and be comfortable with the ‘why’ and explain it with conviction and passion for why we’re doing it, then we won’t do it.”

Operational effectiveness efforts

Among the financial challenges addressed earlier this year in connection with the changes to the pension plan, Paul said, was the aspect of extracting efficiencies in the operation of the Labs that will lead to cost savings.

“We’re going to change the way we operate and it will have as a result, savings,” Paul said. “The change can’t be something in which you see degradation in the environment in which you work — that’s not what we’re about.”

“Okay, let that Paul said the Labs’ leadership is reviewing for efficiency improvements are:

- Reevaluating the deployment of the leadership structure
- Considering a move to a thin client environment
- Redefining the strategic thrusts
- Changing the way the policy arena interfaces with organizations
- Improving the Labs’ workforce acquisition functions

“The leadership here is really responding and we’ve identified a number of areas that we will be working through,” he said. “You should, over the next several months, start to see some of these impacts and you will know this is why — to generate a better work environment, which also saves money that can be used to support our pension.”

Retiree change

“I’m fairly confident there’s some impact from this change,” Paul said in reference to the recent revisions Sandia made to the corporate policies that govern the use of services performed by Sandia retirees and tested for former employees as contractors.

Paul explained the changes were motivated by two factors: the broad area of contractors using retirees in the correct way and the objective of clearly defining the distinctions between an individual drawing a pension and that of continued employment in an active way.

“We want to make it clear that while an individual is retired, their service to the Labs we take fullest advantage of their ability to mentor, that we give conscious consideration to succession planning and knowledge transfer,” Paul said.

Strategic planning

“Sandia also provides an overview of the status and planning process flow, objectives and goals for the Labs’ strategic planning. The latest update of the strategic plan is on hold while the Labs’ leadership engages in intensive discussion about the objectives that will matter to Sandia over the next five to 10 years, and to develop a framework that integrates the work done at Sandia.”

“It’s important to me that there’s connectivity between where you operate, in delivering milestones,” Paul said. “You’d like to have a sense of [your work] ties back to an overarching, long-term goal for the laboratory. If strategic plans are just sitting on the shelf, and you don’t refer them, then they’re not very useful in making decisions, and I want something that helps leadership make decisions.”

If strategic plans are just sitting on the shelf, and you don’t reference them, then they’re not very useful in making decisions, and I want something that helps leadership make decisions.”

— Paul Hommert

Al Strouphauer honored by Secretary of Defense

Recognition comes for work in support of 2010 Nuclear Posture Review

Al Strouphauer has been awarded the Secretary of Defense Medal for Outstanding Public Service for his work on the 2010 Nuclear Posture Review (NPR). The medal is the second highest civilian award presented by the DoD chief.

Al, with his family looking on, was presented with the award during a ceremony at Sandia last month by Bradley Roberts, deputy assistant secretary of defense for Nuclear and Missile Defense Policy. Al was honored for his service from April 2009 to May 2010 as executive secretary of the Stockpile and Infrastructure Working Group for the NPR, the largest of several similar teams that worked on various aspects of the review. Al led the development of options for the president regarding stockpile sustainment, force structure size, infrastructure modernization, and the skilled nuclear workforce.

According to a citation accompanying the award, Al’s contributions were essential to the successful completion of the NPR and the New Strategic Arms Reduction Treaty, the New START. His technical and operational expertise, the citation said, were “crucial in developing stockpile sizing strategies to reduce the risk from a warhead technical failure or an adverse geopolitical change in the security environment.”

His efforts were pivotal in the analysis that led to the NPR’s recommendation of an increase in funding for the life extension programs (LEPs).

The citation noted the importance of Al’s assistance in resolving differences and obtaining the interagency cooperation to resolve and gain concurrence on the critical NPR report for the nation.

The work done by Al’s group for the NPR were used also by the New START negotiations, and were helpful to long-term strategy development for support of life extensions for the nuclear arsenal and modernization of the NSA infrastructure.

As a result of the working group’s findings, the Obama administration has proposed multibillion dollar budget increases for NSA’s mission for fiscal years 2011 through 2015.

Al came to Sandia in 1983 as a US Army nuclear weapons officer; he was the first military research associate at Sandia/Cali- fornia from 1983-1987. Then he went on to the European Command supporting NATO nuclear forces, and at DOE head- quarters as director of weapons planning implementing President George H.W. Bush’s nuclear initiatives.

After he retired from the Army in 1994, Al joined Sandia’s technical staff in Albuquerque with assignments that focused on long-term strategic management and integration of the nuclear weapons complex to sustain the nuclear arsenal. These included the Defense Programs Analysis Group, the Integration Studies and Support Group, and the Systems Integration Technical Support Organization (STO).
Al Romig leaves Sandia to lead Lockheed Martin's fabled Skunk Works

Story by Iris Aboytes

Executive VP Al Romig is leaving Sandia at the end of December to head Lockheed Martin’s Advanced Development Programs (ADP) — the Skunk Works.

Based in Palmdale, Calif., ADP is the front end of all Lockheed Martin’s aeronautics business, responsible for evolving Lockheed Martin product lines and creating new products and technologies.

Some of the nation’s most celebrated and unique aircraft have come out of the Skunk Works, which has been responsible for the aircraft designs of the U-2, the SR-71 Blackbird, the F-117 Nighthawk, and the F-22 Raptor. Its largest current project is the F-35 Lightning II, which will be used in the air forces of several countries around the world.

“One opportunity presented itself where I can continue to serve my country,” Al says. “I am energized and excited as I take the next step in my career. I have enjoyed all my positions and my roles during my more than 30 years at Sandia. I have always felt that if you stay in a position too long, you can become stale and don’t come up with new ideas. I have been in essentially this job for almost three years. I am leaving before I can no longer contribute to Sandia the way that it deserves.

“I have eight to 10 years of my working career left and I have an opportunity to make an impact on a new organization.”

Al came to Sandia because he felt it was the place where he could best use the skills and talents he had acquired through eight years of post-secondary schooling.

“It turned out that although I had contacts at Sandia, I was actually recruited by the Bell Labs system,” Al says. “I was fortunate to be interviewed and was offered a job at four Bell Labs sites. I chose Sandia because of the nature of the work. Being an offspring of the Cold War, a child of Spunkin, I felt a calling to come to work at Sandia in defense of my country. I was attracted by the quality of the work, the quality of the people, and the mission of the Laboratory.”

Work/life balance

Al has been accused of being a workaholic. “I just have a different work/life balance,” he says. “There is a fine line between my vocation and my avocation. My spare time is spent doing volunteer work, both for community agencies and professional committees.”

Al has served in many positions, including president of ASM — the American Society for Metals — and numerous committees for the National Academy of Engineering. “I don’t expect others to do what I do. It is my way of life.”

To unwind, Al plays golf. “Mike Ciesak taught me,” he says. “He won’t admit to that because I am a terrible golfer.”

When Al first came to Sandia he was an intramural basketball team with Jim Gosler and John Williams, among others.

“We were terrible,” Al says. “I was the worst one. I kept getting accused of trying to play football and fouling out.”

Al’s hobby is reading, says his wife, Julie. “He is an avid reader,” she says. “Al is amazing in that if he reads, hears, or sees something, he knows it. He also has a knack for fixing things. He can fix anything. Al is looking forward to moving to a new house because that means a new set of tools.

“Saturday night is our date night. He always preserves our special time.”

Heart and soul

“My dad has an incredible amount of energy,” says his son, Chris. “He can work all day and teach all night. He loves teaching. He is pretty amazing.”

“When I was growing up, my dad was my soccer coach. He was athletic and used to be a 5K runner. Now we go hiking. That’s my favorite time with my dad now.”

Daughter-in-law Sara is touched by Al’s generosity of spirit. “Alton is a very caring and selfless person,” she says. “who is always willing to help those he cares for or those who are in need. We are very fortunate and lucky to have him in our lives.”

“My dad loves Sandia with his whole heart and soul,” adds Chris. “He loves to go and work.”

One of the most important people in Al’s life today is his 6-year-old granddaughter, Alexandra. She has a special bond with Bubba, her name for him. “I like to play with Bubba and go to the museum,” she says, “especially the one in Albuquerque, because they have the snakes there.”

Al’s gregarious and generous spirit was apparent to his mother, Chris, even when he was a child.

“Even as a little boy Al loved people,” she says. “When we would go out to eat, he would talk with the people at the surrounding tables.”

“He is the best thing that has happened to us,” says his dad, Al.

‘Al truly is my brother’

Al does not have any brothers or sisters, but he and his cousin Donna, who are about five months apart in age, are like brother and sister.

“Al wanted to be an astronaut,” Donna says. “He loves to fly and is actually a pilot.”

Al was in the Air Force ROTC and learned to fly, but with the Vietnam War over, the military didn’t need any more pilots, and he was not commissioned. He flew privately until his many commitments took over.

Al adds: “Flying when your skills aren’t sharp is dangerous. Safety always comes first.”

“Dona’s not surprised he ended up at a weapons lab.”

“When you don’t know about Al is that even as a child, he made bombs,” she says. “We would get a cookie tin, fill it with dirt, add berries from the evergreen shrubs, and water, then put the lid on, throw it up in the air, and watch it explode when it hit the ground. His career path didn’t deviate far from his childhood.

‘Al truly is my brother. We are cousins by birth, but brother and sister by choice.’

Julie and Al will be heading to their new home in the Palmdale area during the holidays. Their home in Albuquerque is being remodelled. They want to make sure it is ready for when Al retires in a few years and they return home.

“l am excited for Al as he approaches his new challenge,” Julie says. “I am happy to be going to a different place with my absolute best friend.”

‘I will be back’

“I will have mixed emotions when I leave Sandia. It is with sadness that I close this chapter of my life, but I look forward with excitement to my challenges,” Al says. “The work that I will be doing will continue to touch Sandia. There is no doubt in my mind that I will be back on occasion to support our joint work.”

“I will miss the people most,” he says. “Sandians will be in my heart, my mind, and my soul for the rest of my life. Nothing will ever replace them. It is an old cliché, but I would die for the people in this Lab.”
AL ROMIG

Sandia Blue through and through

It has been more than a pleasure to be a close friend of Al Romig. I consider it one of the great good fortunes of my life. I met Al when I interviewed at Sandia. We hit it off immediately, both professionally and personally. As staff members together in Center 1800, we collaborated on research, wrote joint publications, and gave co-authored presentations.

But our connections only began with our technical work. My wife, Wendy, and I asked Al to be godfather to our first child, Jacqueline. We then asked his wife, Julie, to be godmother to our second child, Linda. So Al and Julie are forever connected to our family through our children. They have been outstanding godparents in every way imaginable.

As time went on, Al was promoted to ever higher levels of management at Sandia. He turned out to be my direct supervisor on a couple of occasions. One time, during my performance evaluation, he suggested a goal for the upcoming year to teach him how to play golf. At the time, I had a certain level of competency in playing, but I deferred on the idea of teaching him, reminding Al that some goals were beyond the “stretch” category. While I can’t say that Al will ever make the Seniors’ Tour, I can say that almost no one I know took on the task of learning with more vigor.

And that really describes Al in a very fundamental way. He takes on everything he does with great enthusiasm. There has been no one I know who has given more to Sandia Laboratories than Al Romig. I believe that Gov. Bill Richardson often referred to him as “Dr. Sandia.” That is how most people will remember him, as someone who gave his all for our lab.

I am not the only one who believes that if he was cut, Al would bleed “Sandia blue.” We will all miss his sense of optimism, his friendship, and his leadership. At Sandia, there will not be another one like Al Romig. — Mike Cieslak, 2800

How the Skunk Works got its name

It was the wartime year of 1943 when Kelly Johnson brought together a hand-picked team of Lockheed Aircraft Corporation engineers and manufacturing people to rapidly and secretly complete the XP-80 project. Because the war effort was in full swing there was no space available at the Lockheed facility for Johnson’s effort. Consequently, Johnson’s organization operated out of a rented circus tent next to a manufacturing plant that produced a strong odor, which permeated the tent.

Each member of Johnson’s team was cautioned that design and production of the new XP-80 must be carried out in strict secrecy. No one was to discuss the project outside the small organization, and team members were even warned to be careful how they answered the phones.

A team engineer named Irv Culver was a fan of Al Capp’s newspaper comic strip, “Li’l Abner,” in which there was a running joke about a mysterious and malodorous place deep in the forest called the “Skonk Works.” There, a strong beverage was brewed from skunks, old shoes and other strange ingredients.

One day, Culver’s phone rang and he answered it by saying “Skonk Works, inside man Culver speaking.” Fellow employees quickly adopted the name for their mysterious division of Lockheed. “Skonk Works” became “Skunk Works.” The once informal nickname is now the registered trademark of the company: Skunk Works®.
Al first impressed me when he was director of Center 1300 and I was detailed to support him for six months. His attention to every detail of the job, from the administrative requirements to the management of a center, was amazing. His dedication made me think that if he were to be hit by a bus, his blood would be thunderbird blue. Al actually looks forward to performance management meetings so he can mentor his staff. His volunteers are usually grumpy with a warm “Welcome to the Woodshed!” He has a big heart and is always helping people. Even with his demanding schedule, he finds time to help when asked — and when not asked, he volunteers. His high energy level earned him the nickname of Tasmanian Devil.

Al has been an influential mentor in my life. I will miss his integrity, dedication, friendship, and passion for life.

Chrliss Cassias, Org. 3

I met Al when Lockheed Martin, then Martin Marietta, was awarded the contract to run Sandia National Laboratories. As an executive assistant, I had taken time to read the new contract and had a lot of enthusiasm in it to give to the gifts and grants program and the focus on technology commercialization. Al is still a champion today.

Al is known in the community not just for being a Sandia leader, but for writing personal checks to commercialize. Al is known for his leadership and management experience to MRN as it grew to 85 members this year. The United Way of Central New Mexico has grown tremendously under Al’s leadership over the past several years; first as the chairman of our strategic planning process, and for the past year as the chairman of the board of directors. United Way: Al has created a legacy of caring that will never be forgotten.

Randy Woodcock, Vice President & Chief Strategic Officer, The United Way of Central New Mexico

While Al and I were in the leper colony (a place for new employees without clearances to work together), we started a basketball team in a Sandia league. I’m confident that this is the worst basketball team in the history of Sandia. Although Al jokes about being the worst member on the team, he really was. There began our friendship. Al is a passionate advocate for Sandia. As you can tell, Al is not just my colleague. He is my friend.

Jim Gasler, Org. 2

Sen. Pete Domenici founded The Mind Research Network (MNR) more than 12 years ago with the vision of leveraging brain imaging technologies to develop being in the national labs with clinical neuroscience research, in the hopes of finding new ways to diagnose brain disease. Al Romig has been instrumental in shepherding this vision through his extensive and continued service to the organization.

His management and scientific leadership have played a critical role in MNR’s transformation from a fledgling start-up organization to a viable, self-sustaining institute that is now primarily funded by competitive research grants.

Dr. Romig’s devotion and service to MNR have been critical to its success. Al has provided both scientific leadership and management experience to MNR as it evolved from just a few employees 12 years ago to a thriving, 200-employee neuroscience research organization.

John Rasswe, PhD, President and CEO, The Mind Research Network

Al brings an unparalleled energy and devotion to the multiple facets of his work for Sandia. He is not nicknamed the Tasmanian Devil for nothing. He has the ability to switch from techno-geek, to business savvy, to soft-hearted person in the history of the world. His support for diversity and inclusion is heartfelt. At last year’s Outreach Committee Recognition event, Al teared up while thanking all the members of the various committees. Al is an effective leader because he is an authentic leader. I know he will be successful in all his future challenges, and I wish him all the best.

Becky Kraus, 11000

Al Romig emphasized a point during this 2006 interview.

(PhotobyRandyMontoya)

I came to Sandia in 1990. Al had been a teaching assistant at Lehigh University, and encouraged me to come to Sandia. We were selling our house so my wife did not come right away. During this time Al and I were roommates.

I had forgotten his late-night work habits and assumed (wrongly) he worked regular hours. One evening I stayed until about 5:30 to complete some revisions on the paper, and I ran it up to his office and put it on his desk. The next morning I got in at about 7:30 a.m., and the paper was back on my desk with Al’s suggestions and comments. I made changes and put it on his desk about 6:30 p.m., and I went home.

The next morning I came in early and the paper was back on my desk with further changes and revisions! I started to think that Al was still up to the work schedule that he kept in graduate school. That night I made the changes and went home. I came back to work at about 10 p.m. and snuck up to Al’s now dark office and slipped it under his door.

I got to work early the next day thinking I would be at his desk before he put the paper back on my desk. To my utter amazement and disappointment, there was the paper sitting on my desk with the final set of revisions! I made the final changes, walked up to Al’s office and handed it to him and said, “You win!”

Al looked at me and said, “Did you?” He did not even think or realize what had gone on was out of the ordinary for me!

Joseph Michael, 1822

Working for Al Romig the last three years have been the busiest, most fast-paced years of my life! In an effort to try to keep up with Al, I have learned to check my Blackberry, during the off-hours, at all times of the day/night. Yes — seven days a week!

It has been a wonderful experience. I have learned much from him. He never ceases to amaze me. As busy as he is, he manages to think of every single detail. There is so much I admire about Al. He is brilliant; he’s honest; he has a sense of humor; he listens; he cares; etc. And what about his energy level?

I’ll miss our morning chats. Did the Dallas Cowboys win? How did the Philadelphia Eagles do? I won’t need to work to keep up with Al, I have learned to check my Blackberry, during the off-hours, at all times of the day/night. Yes — seven days a week!

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Wrong number leads to new way to collect solar power, Up-and-Coming Innovator recipient says

By Heather Clark

Greg Nielsen (1749) could have been annoyed by a caller who telephoned him by mistake, thinking he was a different former Truman Fellow, but instead he engaged in conversation, and a collaboration was born.

“It was a wrong number, but I heard he was from the solar group and he was looking for another Truman Fellow,” Nielsen said. “He gave me the name and then he said, ‘Actually, I have this idea. It could be useful for solar power,’ and I got excited.”

Five years later, Greg, the caller, Vipin Gupta (6124), and more than two dozen other researchers developed tiny glitter-sized photovoltaic (PV) cells that could revolutionize the way solar energy is collected and used.

Nielsen is among 15 Sandians who were honored with the first Up-and-Coming Innovator awards, which recognize the innovation and intellectual property achievements of students, postdocs, and early-career researchers.

“All that glitters — Greg Nielsen is part of a team of Sandia researchers that developed glitter-sized photovoltaic cells that could revolutionize the way solar power is collected and used. Greg is a recipient of Sandia’s Up-and-Coming Innovator award. (Photo by Randy Montoya)

Because the solar cells are so small — about 20 microns thick — they are flexible, which has enormous advantages for manufacturing and efficiency.

Greg says his team is working on how to put solar glitter into products and hopes to create some functional demonstrations of solar glitter prototype systems, possibly within the next year.

Talking in his office, Greg pulls a container off the top of his desk that contains what looks like a bubble of oil with glitter inside it floating in water. Greg explains researchers are looking at self-assembled monolayers using different chemicals, so they can coat either the metal or the other face of the solar cell to orient the glitter in a certain direction.

“So basically you can get them sunny side up,” Greg says. “The reason this is cool is that we’re working to create a system where you use these very small solar cells as a sort of photovoltaic ink. We want to print them onto a flexible substrate or wherever we want, thousands at a time, like a Xerox copying process. We’ve made some progress down that path. We’ve done some things there that people have not done before.”

Working on self-assembly of cells

Greg says his team has been successful at working within the confines of current manufacturing techniques and improving the efficiency of the solar cells, but they are still working on the self-assembly of the cells.

Greg emphasizes that nearly 30 people worked on solar glitter, which has helped move the innovation along.

“Sandia is definitely a place where people are inclined to work together and that really does help,” Greg says. “You can come up with really great solutions in your own little area and that’s fantastic, but if you can bring together people from a variety of areas to come up with a solution, then that’s even more powerful.”

Greg first encountered Sandia as an undergraduate intern working with the Cuffit Group, which works with an enabling technology for high-performance computer modeling and simulations. Rob Leland (1400) was his manager at the time and helped him consider different options for graduate school, Greg says.

After getting his bachelor’s degree in mechanical engineering from Utah State University, Greg went to MIT, where he received a master’s in mechanical engineering and a doctorate in mechanical engineering with a focus on optical microsystems.

One of the first Truman Fellows

Greg was one of two researchers to become the first Truman Fellows at Sandia in 2004. He worked on improving the energy efficiency and performance of optical MEMS switching, which would make the switches more appealing for applications in, for example, computing or telecommunications.

Greg says he came up with some ideas that led to faster switching using less power. The result was a switch that operates at 225 nanoseconds and needs 22 volts, and was about 10 times faster than the fastest switch on the market at the time.

After the Truman Fellowship, Greg became a member of technical staff in the same organization, where he was named an entrepreneur.

The 2010 Up-and-Coming Innovators are:

Benjamin John Anderson (1833) • Nicolas Ricikhat (5719) • Jason David Bradbury (5747) • Shawn Dirk (1821) • Nathan J. Edwards (5622) • Prabal Nandy (5717) • Gregory Nielsen (1749-2) • Shawn Pauzi (1341) • Tahtiba Peyton (5919) • Róisín Polisky (1714) • Thomas Quirk (1384) • Ann Marie Raynal (5354) • Karen Walldrip (2546) • George Wang (1126) • Greg Wickstrom (2141)
At Sandia, giving is just a way of life

The item came out in the Sandia Daily News: Four hundred and one gifts were needed for children in the care of the New Mexico Children, Youth, and Families Department. The department serves and supports children and families, and supervises youth in a responsive, community-based system of care.

The requests weren’t elaborate — dolls, trucks, and gift cards. Less than two days later, Sandians had signed up to give the gifts. “I requested and was given a list of 88 more,” says Patty Zamora (3652). “Twenty minutes after the announcement came out in the SDN, Sandians had already signed up for the last 88.

“A quote by Eileen Elias Freeman in The Angels Little Instruction Book says ‘It isn’t the size of the gift that matters, but the size of the heart that gives it.’ The writer could have been thinking of Sandia, where giving is a way of life. Sandians realized long ago that only together are we the most powerful and making the biggest difference, and Sandians work at making that difference.”

In November, Sandia Office Professionals’ Quality Council (OPQC) teamed with Community Involvement Dept. 3652 to collect 237 turkeys and 69,478 pounds of food for the Albuquerque Roadrunner Food Bank’s Holiday Food Drive.

Shoe fittings are ongoing through early next year. Needy children are identified by their school officials. More than 500 children are fitted through the generosity of Sandians. Sandians contribute more than $13,000 yearly.

Sandians’ crowning glory is the Employee Caring Program, or ECP, where Sandia employees and retirees have pledged more than $4.26 million to the United Way of Central New Mexico. That translates into more than 70 percent of the Sandia population contributing generously. Sandia has been the No. 1 donor to the United Way since its inception more than 50 years ago. Final numbers will be revealed in February.

Donating, especially at this time of year, is not dedicated to just Sandia-sponsored programs. Drives for needy families are ongoing and are held by various Sandia departments. Corporate giving at Sandia is coordinated and administered by Community Involvement.

— Iris Aboytes

Sandia Lab Singers make every occasion special

Sandia Lab Singers, a group of Sandians who love to sing, entertain members of Sandia’s executive offices. Led by Bob Miltenberger, the group sings at various Sandia and community events throughout the year. The group is open to anyone working at Sandia. For more information on the group, go to sharepoint.sandia.gov/sites/Singers/default or contact Bob at rmiltenber@sandia.gov or Cynthia Graham at cgraham@sandia.gov.

(Photos by Randy Montoya)